



TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER

31st Annual Student Research Week
March 19-22, 2019
Texas Tech University Health Sciences Center (TTUHSC)
Lubbock, Texas

the Graduate School of Biomedical Sciences 2019 Student Research Week Committee

Co-Directors: Whitney Redman & Riccay Elizondo
Vice Director of Marketing: Ksenija Korac
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Vice Director of Operations & Judging: Bradley Schniers

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Speaker travel arrangements: Leslie Fowler, Graduate School of Biomedical Sciences
Abstract book design: Deidra Satterwhite, Office of Student Services
Student Research Week Banquet: Monica Sharma and Brianyell McDaniel Mims, Graduate School of Biomedical Sciences Graduate Student Association; Velia Martinez, Graduate School of Biomedical Sciences

The 2019 Student Research Week Committee would like to extend their warmest thanks to the following for their contributions and support in making Student Research Week a great success this year:

the Graduate School of Biomedical Sciences: Leslie Fowler, Pam Johnson and Velia Martinez
the Office of Student Services: Deidra Satterwhite
the Office of Communications and Marketing: Suzanna Cisneros, Amy Skousen, Zach Tijerina and Kami Hunt
the Office of the President: Didit Martinez
the School of Medicine: Office of the Dean: Charity Donaldson
Educational Media Services: Neal Hinkle
the departments of cell biology and biochemistry, pharmacology and neuroscience, immunology and molecular microbiology, cell physiology and molecular biophysics, medical education and graduate medical education; the School of Biomedical Sciences at Lubbock, Abilene, and Amarillo, the School of Medicine, the School of Nursing, the School of Health Professions, the School of Pharmacy, the Office of Professional Education, and Texas Tech University.

Lou Diekemper Endowment fund for providing a travel scholarship.
Dr. Beverly Chilton for establishing the Bette B. Chilton scholarship in honor of her mother.

We also are very grateful to all the TTUHSC faculty for their guidance and support.

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Information about TTUHSC, including information about the Graduate School of Biomedical Sciences, can be found at www.ttuhscc.edu.

Friday, March 22, 2019

KEYNOTE LECTURES

Marvin Whiteley, Ph.D.

Time: 11:30 a.m. - 12:30 p.m.

Anice Lowen, Ph.D.

Time: 1:30 - 2:30 p.m.

STUDENT SPEAKERS

Time: 9 - 11:30 a.m.

Maternal Electronic Cigarette Use Can Enhance Spring Susceptibility to Hypoxic-Ischemic Brain Injury

Ali Sifat, Graduate Student, Amarillo

Determining the effect of the WNT/ β -catenin pathway on the ischemic blood-brain barrier in vitro and in vivo

Shyanne Page, Graduate Student, Amarillo

Assessing the Activity of CRF Neurons in the Central Amygdala Following Application of Kappa Opioid Receptor Agonist: A Novel Network in Pain Relief

Preston D'Souza, Medical Student, Lubbock

Effect of Trichuris co-infection on Sm-p80-based vaccine in baboons

Jordan May, Graduate Student, Lubbock

PEPT1 as a tumor promoter and novel drug target to treat pancreatic cancer

Bradley Schniers, Graduate Student, Lubbock

Stressful Aging in Yeast: Roles for SIR2 and Cell Growth

Jessica Smith, Graduate Student, Lubbock

Toxicity and Limitations of Glycoside Hydrolases in Dispersing Poly-Microbial Biofilms

Whitni Redman, Graduate Student, Lubbock

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POSTER SESSIONS

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ABSTRACTS

Graduate Students - 1st & 2nd Years

Graduate Students - 3 Years +

Pharmaceutical Sciences | Pharmacy

Medical Students 1st & 2nd Years | GMS | PH

School of Nursing

3rd ANNUAL TTUHSC STUDENT RESEARCH

W

SCHEDULE

TUESDAY, MARCH 19, 2019

9:00am - 12:00pm	Vendor Show	5th Floor BC
12:00pm - 1:00pm	Open Poster Exhibit I	ACB Lobby
1:00pm - 4:00pm	Poster Session I	ACB Lobby

WEDNESDAY, MARCH 20, 2019

9:00am - 12:00pm	Poster Session II	ACB Lobby
12:00pm - 1:00pm	Open Poster Exhibit II	ACB Lobby
1:00pm - 4:00pm	Poster Session III	ACB Lobby

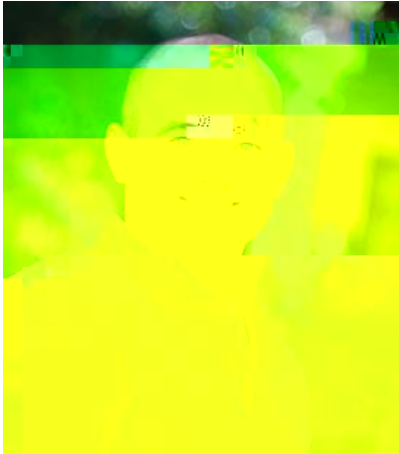
THURSDAY, MARCH 21, 2019

9:00am - 12:00pm	Poster Session IV	ACB Lobby
12:00pm - 1:00pm	Open Poster Exhibit III	ACB Lobby
1:00pm - 4:00pm	Poster Session V	ACB Lobby
7:00pm	SRW Banquet	McKenzie-Merket Alumni Center

FRIDAY, MARCH 22, 2019

8:30am - 9:00am	Continental Breakfast	ACB 100
9:00am - 11:30am	Select Student Presentations	ACB 100
11:30am - 12:30pm	Marvin Whiteley, Ph.D.	ACB 100
12:30pm - 1:30pm	Lunch	ACB Lobby
1:30pm - 2:30pm	Anice Lowen, Ph.D.	ACB 100
2:30pm - 3:30pm	Awards Ceremony	ACB 100
3:30pm - 4:30pm	Students' Coffee with the Speakers	ACB 100

SPEAKERS



Marvin Whiteley, Ph.D.
Professor,
Georgia Institute of Technology

Dr. Marvin Whiteley is a tenured professor in the Bennie H. & Nelson D. Abell Chair in Molecular and Cellular Biology department at Georgia Institute of Technology. From 2013 to 2017 Dr. Whiteley served as the Co-Director for the Emory-Children's Cystic Fibrosis Center. He began his teaching career as an Assistant Professor in Microbiology at the University of Oklahoma Health Sciences Center in 2002, then moved up the ranks at the University of Texas at Austin as the Director of the John R. LaMontagne Center for Infectious Disease. Dr. Whiteley received his Ph.D. in Microbiology from the University of Iowa where he studied quorum sensing and biofilm development in *Pseudomonas aeruginosa*. He was a postdoctoral fellow at Stanford University followed by serving as a scientist for Cumbre Pharmaceuticals prior to his academic career.

Dr. Whiteley is a well-established scientist with over 100 publications. He is currently on three NIH R01 grants as well as grants from the Burroughs Wellcome Fund, Army Research Office, Human Frontiers of Science, and Cystic Fibrosis Foundation. He has mentored 5 post-doctoral fellows and 10 students. Dr. Whiteley has served on numerous grant review panels, serves as the Editor for *Infection and Immunity* as well as *mBio*, and currently has 2 patents. He has received many awards, Georgia Research Alliance Eminent Scholar being the most recent. Dr. Marvin Whiteley is a prime example as a reputable, well-known scientist.



Anice Lowen, Ph.D.
 Associate Professor,
 Emory University School of Medicine

Dr. Anice Lowen is a tenured associate professor in the Department of Microbiology and Immunology at Emory. Prior to her current position, Lowen completed her PhD with Richard Elliott on Bunyamwera virus at the University of Glasgow. She then continued her post-doctoral training with Peter Palese at Mount Sinai School of Medicine in New York City. Her current research at Emory focuses on the mechanisms of rapid influenza virus evolution and how it contributes to the ecology of the virus within the wide range of hosts it infects. Her work seeks to improve the understanding of viral reassortment at a fundamental level by probing the underlying factors that dictate the frequency of reassortment and the implications of reassortment for influenza A virus evolution.

As a junior investigator, Dr. Lowen has received numerous awards recognizing her devotion to research. She currently holds 4 NIH grants, and was elected into “The Emory 1%” for receiving a perfect score on a NIH grant application. In Dr. Lowen’s relatively short career, she has acquired many accomplishments and continues to be an excellent example for women in science.

JUDGES

Abraham Al-Ahmad, Ph.D.
Pharmaceutical Sciences

Frank Babb, M.D., FAAFP
Medicine

Rashmita Basu, Ph.D.
Healthcare Administration

Khalid Benamar, Ph.D.
Pharmacology and Neuroscience

Susan Bergeson, Ph.D.
Pharmacology and Neuroscience

Kishor Bhende, M.D.
Pediatrics

Yangzom D. Bhutia, Ph.D., D.V.M.
Cell Biology and Biochemistry

Ion Alexandru Bobulescu, M.D.
Cell Biology and Biochemistry

Jean-Michel Brismee, ScD, PT
Physical therapy

Isabel Castro, Ph.D.
Immunology and Molecular Microbiology

Jane Colmer-Hamood, Ph.D.
Immunology and Molecular Microbiology

Gail Cornwall, Ph.D.
Cell Biology and Biochemistry

John W. Culberson, M.D.
Family and Community Medicine

Cornelia de Riese, M.D.
Obstetrics and Gynecology

Je Dennis, Ph.D.
Public Health

Quynh Hoa Do, Ph.D.
Cell Biology and Biochemistry

Jannette Dufour, Ph.D.
Cell Biology and Biochemistry

Derek Fleming, Ph.D.
Surgery

Joe Fralick, Ph.D.
Immunology and Molecular Microbiology

Nadezhda German, Ph.D.
Pharmaceutical Sciences

Kerry K. Gilbert, ScD, COMT
Physical therapy

Petar Grozdanov, Ph.D.
Cell Biology and Biochemistry

Josee Guindon, Ph.D., DVM
Pharmacology and Neuroscience

Ronald Hall, PharmD
Pharmacy

Abdul Hamood, Ph.D.
Immunology and Molecular Microbiology

George I. Henderson, Ph.D.
Pharmacology and Neuroscience

Aveline Hewetson, Ph.D.
Cell Biology and Biochemistry

Jody Janovick, Ph.D.
Cell Biology and Biochemistry

Guangchen Ji, Ph.D.
Pharmacology and Neuroscience

Cynthia Jumper, M.D., M.P.H.
Public Health

Min Kang, PharmD
Pediatrics

Audrey Karamyshev, Ph.D.
Cell Biology and Biochemistry

Gurvinder Kaur, Ph.D.
Cell Biology and Biochemistry

Michelle Keyel, Ph.D.
Cell Biology and Biochemistry

Lingkun Kong, M.D.
Ophthalmology

Cassie Kruczek, Ph.D., M.S.
Medical Education

Koy Kubala, M.S.
Molecular Pathology

Subodh Kumar, Ph.D.
Garrison Institute on Aging

Hongjun (Henry) Liang, Ph.D.
Cell Physiology and Molecular Biophysics

Hairong Ma, Ph.D.
Cell Physiology and Molecular Biophysics

Clinton MacDonald, Ph.D.
Cell Biology and Biochemistry

Adebayo Molehin, Ph.D.
Internal Medicine

Srinivas Nandana, Ph.D.
Pharmacology and Neuroscience

Madhusudhanan Narasimhan, Ph.D.
Pharmacology and Neuroscience

Volker Neugebauer, M.D., Ph.D.
Pharmacology and Neuroscience

Kumar Palle, Ph.D.
Cell Biology and Biochemistry

Hariharan Parameswaran, Ph.D.
Cell Physiology and Molecular Biophysics

J.A. Pradeepkiran, Ph.D.
Garrison Institute on Aging

Courtney Queen, Ph.D.
Public Health

Sabarish Ramachandran, Ph.D.
Cell Biology and Biochemistry

Bhagavathi Ramasubramanian, Ph.D.
Garrison Institute on Aging

Catherine Reppa, M.D.
Ophthalmology

Ana M. Rivas Mejia, M.D.
Internal Medicine

Kirsten Robinson, M.D.
Pediatrics

Rebecca Sametz, Ph.D.
Rehabilitation Counseling

Ariel Santos, M.D., MPH
Surgery

Toshihiro Sato, Ph.D.
Cell Biology and Biochemistry

Sathish Sivaprakasam, Ph.D.
Cell Biology and Biochemistry

Annette Sobel, M.D., M.S.
Graduate Medical Sciences, Strategic Partnerships

Sanjay K. Srivastava, Ph.D.
Immunotherapeutics and Biotechnology

Leslee Taylor, Ph.D., ATC, LAT
Athletic Training

Elena Tikhonova, Ph.D.
Cell Biology and Biochemistry

Phat Tran, M.D.
Ophthalmology

Manisha Tripathi, Ph.D.
Pharmacology and Neuroscience

Ina Urbatsch, Ph.D.
Cell Biology and Biochemistry

Murali Vijayan, Ph.D.
Garrison Institute on Aging

Heidi Villalba, M.S.
Pharmaceutical Sciences

Margaret Vugrin, MPH
Public Health

Irfan Warraich, M.D.
Pathology

CRITERIA FOR CASE P

ANALYSIS/SYNTHESIS:

1. Includes data from 4 or more sources (explicitly stated in the case study)
2. Reveals student's strengths, weaknesses, etc.

DIAGNOSIS:

1. Detailed description of consistencies or patterns leading to summary of the problem or situation.
2. Describes possible causes.
3. Includes other significant characteristics of the student.

INTERVENTIONS:

1. Includes five to six sessions.
2. Detailed summary of strategies and techniques used.
3. Strong plan.

EVALUATION:

1. Detailed summary of results.
2. Includes strong pre- and post-test evidence.
3. Includes decision for termination or referral.

REFLECTION:

1. Thoughtful description of the experience, the challenges, and the successes.

MICELLANCEOUS:

1. Text is well written.
2. Sections are labeled.
3. Minimal grammar or spelling errors.

CRITERIA FOR SCIENCE

SIGNIFICANCE/ INTRODUCTION:

1. Significance of the work and why it is important to conduct this research is addressed.
2. Background information is clearly presented.
3. Hypothesis is clearly stated. (for science categories only)

ORGANIZATION

1. Methods utilized are clearly explained.
2. Presentation is well organized.
3. Student shows knowledge of the subject.

RESULTS:

1. Tables or graphs are used to enhance the presentation.
2. Presenter explains the figures and results.
3. Figures are appropriately formatted and clearly understood.

DISCUSSION/CONCLUSIONS:

1. Presenter summarizes findings clearly.
2. Presenter clearly explains what the findings mean and their significance.
3. Directions for future investigation or management of similar cases are indicated/discussed.

PRESENTATION /RESPONSE TO QUESTIONS:

1. Overall style of the presentation is effective (delivery/eye contact).
2. Presenter uses time effectively.
3. Presenter answers questions in an organized, concise, and accurate fashion.

COMMERCIALIZATION (IF APPLICABLE):

1. Presenter states how their research impacts the world.
2. Presenter states how the research could be a product.
3. Presenter states steps they would take to pursue commercialization.

GS1-2	Anderson, T	MS1-2	Ahle, Daniel
GS1-2	Baishya, Jiwasnika	MS1-2	Al Dogom, Sara
GS1-2	Bisht, Karishma	MS1-2	Aldrete, Jonathan
GS1-2	Brown, Timothy	MS1-2	Alhaj, Sara
GS1-2	Ellen, Christopher	MS1-2	Almeida, Micah
GS1-2	Enriquez, Josue		
GS1-2	George, Elizabeth		
GS1-2	Hernandez, Sarah		
GS1-2	Jackson, Benjamin		
GS1-2	Katz, Courtney		
GS1-2	Kopel, Jonathan		
GS1-2	Korac, Ksenija		
GS1-2	May, Jordan		
GS1-2	Mazzitelli, Mariacristina		
GS1-2	Mohiuddi, Ismail		
GS1-2	Myers, Caitlyn		
GS1-2	Navarro, Stephany		
GS1-2	Oliver, Darryll		
GS1-2	Reese, Britney		
GS1-2	Schaubhut, Alexsandra		
GS1-2	Schniers, Bradley		
GS1-2	Washburn, Rachel		
GS1-2	Ximenez, Brandon		
GS1-2	Young, Victoria		
GS3+	Alqahtni, Abdulaziz		
GS3+	Beasley, Kellsie		
GS3+	Blanton, Henry		
GS3+	Bounds, Kayla		
GS3+	Elizondo, Riccay		
GS3+	Elmassry, Moamen		
GS3+	Hein, Matthew		
GS3+	Liu, Xiaobo		
GS3+	Macha, Shawn		
GS3+	McDaniel-Mims, Brianyell		
GS3+	Mueller, Karl		
GS3+	Pedroza, Diego		
GS3+	Pirayesh, Elham		
GS3+	Redman, Whitney		
GS3+	Ristic, Bojana		
GS3+	Roberts, Emma		
GS3+	Sharma, Monica		
GS3+	Sikder, Mohd Omar Faruk		
GS3+	Smith, Jessica		
GS3+	Stuebler, Antonia		
GS3+	Vartak, David		

MS3-4	Dadashazar, Samareh	PHAR	Bagchi, Sounak	SHP	Nichols, Charles
MS3-4	Danaj, Alexander	PHAR	Brindle, Athena	UNDG	Aftabi, Ali
MS3-4	Dash, Akshar	PHAR	Esfahani, Shiva	UNDG	Brito, Maritza
MS3-4	Deleon, Sabrina	PHAR	Greene, Carl	UNDG	Cristy, Shane
MS3-4	Dixon, Timothy	PHAR	Kaushik, Itishree	UNDG	Gomez, Andre
MS3-4	Eldem, Irem	PHAR	Lahooti, Behnaz	UNDG	Hilken, Tate
MS3-4	Esquivel, Esteban	PHAR	Lee, YoonJung	UNDG	Keim, Klara
MS3-4	Fisher, John	PHAR	Nozohouri, Saeideh	UNDG	Kjellgren, Abbey
MS3-4	Foley, David	PHAR	Page, Shyanne	UNDG	Little, William
MS3-4	Gavin, Meredith	PHAR	Racheal, Grace	UNDG	Lopez, Andrea
MS3-4	Gonzales, Alan	PHAR	Ramachandran, Sharav	UNDG	Miller, Sarah
MS3-4	Hess, Andrea	PHAR	Raut, Snehal	UNDG	Nicholson, Makayla
MS3-4	Hoang, Dustin	PHAR	Reddy, Sreedhar	UNDG	Tudman, Jai'Cee
MS3-4	Holstead, Brady	PHAR	Rolph, Daniela	UNDG	Welch, Garrett
MS3-4	Jacob, Daron	PHAR	Sajib, Md Sanauallah		
MS3-4	Kibuule, Grace	PHAR	Sifat, Ali		
MS3-4	Kirkpatrick, Carson	PHAR	Sivandzade, Farzane		
MS3-4	Kureishy, Mohammad	PHAR	Tuz, Fatema		
MS3-4	Le, Audrey				
MS3-4	Lindgren, Taylor	R&CF	Bokaie, Hassan		
MS3-4	Lines, Jefferson	R&CF	Clarke, Cameron		
MS3-4	Lung, John	R&CF	Homen, Dylan		
MS3-4	Lunney, Austin	R&CF	Ibilor, Christine		
MS3-4	Macleay, Katelyn	R&CF	Joginpalli, Sharanya		
MS3-4	McCarthy, Brandon	R&CF	Johnson, Drew		
MS3-4	Mitchell, Diana	R&CF	Leach, Christopher		
MS3-4	Muysson, Marcella	R&CF	Lu, Ho-Cheng		
MS3-4	Nguyen, Thinh	R&CF	Mbagwu, Chinyere		
MS3-4	Opoku, Akwasi	R&CF	Ruiz, Anastasia		
MS3-4	Osinovsky, Jamie	R&CF	Schoof, Jacob		
MS3-4	Parikh, Niki	R&CF	Schwalk, Audra		
MS3-4	Pham, Theophilus	R&CF	Schwartz, Cynthia		
MS3-4	Pillutla, Pranati	R&CF	Seckel, Shannon		
MS3-4	Puccio, Olivia	R&CF	Shank, Sara		
MS3-4	Raju, Sneha	R&CF	Song, Elisa		
MS3-4	Rittmann, Randall	R&CF	Stanley, Russell		
MS3-4	Rosales, Abigail	R&CF	Toledo, Almon		
MS3-4	Ruppert, Misty	R&CF	Valencia, Carlos		
MS3-4	Saa, Lisa	R&CF	Thein, Kyaw		
MS3-4	Slate, Rachel	R&CF	Vorakunthada, Yuttiwat		
MS3-4	Stamps, David	R&CF	Ward, Jennifer		
MS3-4	Tello, Nadia				
MS3-4	Tsen, Adam	SHP	Bassett, Cameron		
MS3-4	Willms, Joshua	SHP	Chen, Yo-Rung		
MS3-4	Younes, Lena	SHP	Dewan, Birendra		
MS3-4	Zhao-Fleming, Hannah	SHP	Drusch, Alexander		
		SHP	Jin, Dongkwan		
PHAR	Ahmed, Ekram	SHP	Kapila, Jeegisha		
PHAR	Albekairi, Thamer	SHP	Liu, Yilan		
PHAR	Anwar, Mohammad	SHP	Murphy, Brandi		

Judging Group 1A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU1	1:30-1:45	Dewan, Birendra
TU2	1:45-2:00	Kapila, Jeegisha
TU3	2:00-2:15	Jin, Dongkwan
TU4	2:15-2:30	Nichols, Charles
TU5	2:30-2:45	Bass, Cameron
BREAK		
TU26	3:00-3:15	Drusch, Alexander
TU27	3:15-3:30	Liu, Yilan
TU28	3:30-3:45	Chen, Yo-Rong
TU29	3:45-4:00	Toledo, Almond
TU30	4:00-4:15	Joginpalli, Sharanya

Judging Group 4A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU16	1:30-1:45	Young, Victoria
TU17	1:45-2:00	Schaubhut, Alexsandra
TU18	2:00-2:15	Jackson, Benjamin
TU19	2:15-2:30	Washburn, Rachel
TU20	2:30-2:45	Korac, Ksenija
BREAK		
TU41	3:00-3:15	Kopel, Jonathan
TU42	3:15-3:30	Hernandez, Sarah
TU43	3:30-3:45	Schniers, Bradley
TU44	3:45-4:00	Katz, Courtney
TU45	4:00-4:15	Ellen, Christopher

Judging Group 2A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU6	1:30-1:45	Clarke, Cameron
TU7	1:45-2:00	Mbagwu, Chinyere
TU8	2:00-2:15	Vorakunthada, Yawat
TU9	2:15-2:30	Ibilor, Chrise
TU10	2:30-2:45	Shank, Sara
BREAK		
TU31	3:00-3:15	Ward, Jennifer
TU32	3:15-3:30	Schoof, Jacob
TU33	3:30-3:45	Song, Elisa
TU34	3:45-4:00	Bokaie, Hassan

Judging Group 5A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU21	1:30-1:45	Enriquez, Josue
TU22	1:45-2:00	Navarro, Stephany
TU23	2:00-2:15	Myers, Caitlyn
TU24	2:15-2:30	Bisht, Karishma
TU25	2:30-2:45	George, Elizabeth
BREAK		
TU46	3:00-3:15	May, Jordan
TU47	3:15-3:30	
TU48	3:30-3:45	Mazzitelli, Mariachrisa
TU49	3:45-4:00	

Judging Group 3A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU11	1:30-1:45	Ruiz, Anastasia
TU12	1:45-2:00	Loya Valencia, Carlos
TU13	2:00-2:15	Seckel, Shannon
TU14	2:15-2:30	Schwalk, Audra
TU15	2:30-2:45	Leach, Christopher
BREAK		
TU36	3:00-3:15	Stanley, Russell
TU37	3:15-3:30	Johnson, Drew
TU38	3:30-3:45	Schwartz, Cynthia
TU39	3:45-4:00	Homen, Dylan
TU40	4:00-4:15	Lu, Ho-Cheng

Judging Group 1A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W1	9:00-9:15	Oliver, Daryll
W2	9:15-9:30	Mueller, Karl
W3	9:30-9:45	Macha, Shawn
W4	9:45-10:00	Hein, Mew
W5	10:00-10:15	Pirayesh, Elham
BREAK		
W6	10:30-10:45	Elizondo, Riccay
W7	10:45-11:00	Redman, Whitney
W8	11:00-11:15	Vartak, David
W9	11:15-11:30	Elmassry, Moamen

Judging Group 4B - Wednesday, March 20, 2019

(All the following times are PM!)

Poster	Time	Name
W84	1:15-1:30	Espinosa-Tello, Alejandro
W85	1:30-1:45	Madison, Kyle
W86	1:45-2:00	Domingo-Johnson, E.L.
W87	2:00-2:15	Nguyen, Tam
W88	2:15-2:30	D'Souza, Preston
W89	2:30-2:45	Stewart, Caleb
BREAK		
W90	3:00-3:15	Bolton, Coy
W91	3:15-3:30	Frost, Joshua
W92	3:30-3:45	Mendez, Emily
W93	3:45-4:00	Maveddat, Ashley
W94	4:00-4:15	Nesbitt, William

Judging Group 5B - Wednesday, March 20, 2019

(All the following times are PM!)

Poster	Time	Name
W96	1:15-1:30	Helton, Tyler
W96	1:30-1:45	Dharmapandi, Gnanashree
W97	1:45-2:00	Hope, Brianna
W98	2:00-2:15	Amkiri, Nnana
W99	2:15-2:30	Osemwengie, Bradley
BREAK		
W100	2:45-3:00	Alhaj, Sara
W101	3:00-3:15	Castaneda, Karen
W102	3:15-3:30	Moreno, Tanir
W103	3:30-3:45	Ahle, Daniel
W104	3:45-4:00	Gamm, Bhargavesh
W105	4:00-4:15	Narayan, Monisha

Judging Group 1A - Thursday, March 21, 2019

(All the following times are AM!)

Poster	Time	Name
TH1	9:00-9:15	Miller, Sarah
TH2	9:15-9:30	Kjellgren, Abbey
TH3	9:30-9:45	Lee, William
TH4	9:45-10:00	Lopez, Andrea
TH5	10:00-10:15	Gomez, Andre
BREAK		
TH6	10:30-10:45	Hilken, Tate
TH7	10:45-11:00	Welch, Garrett
TH8	11:00-11:15	Alabi, Ali
TH9	11:15-11:30	Tudman, Jai'Cee
TH10	11:30-11:45	Nicholson, Makayla

Judging Group 2A - Thursday, March 21, 2019

(All the following times are AM!)

Poster	Time	Name
TH11	9:00-9:15	Keim, Klara
TH12	9:15-9:30	Brito, Maritza
TH13	9:30-9:45	Cristy, Shane
BREAK		
TH14	9:45-10:00	Wagstaff, Rachel
TH15	10:00-10:15	Hussain, Shabab
TH16	10:30-10:45	Yer, Thomas
TH17	10:45-11:00	Sankoorikkal, Nikita
TH18	11:00-11:15	Diaz, Rony
TH19	11:15-11:30	Steed, Joanna
TH20	11:30-11:45	On-Nimoh, Joseph

Judging Group 3A - Thursday, March 21, 2019

(All the following times are AM!)

Poster	Time	Name
TH21	9:00-9:15	Almeida, Micah
TH22	9:15-9:30	George, Asher
TH23	9:30-9:45	Lara, Steven J.
TH24	9:45-10:00	Owoade, Damilola
TH25	10:00-10:15	Scarbrough, Kirsten
BREAK		
TH26	10:30-10:45	Karimi, Alikhan
TH27	10:45-11:00	Philip, Stacy
TH28	11:00-11:15	Bunch, James
TH29	11:15-11:30	Ramzanali, Salena
TH30	11:30-11:45	Bihari, Sanyukta

Judging Group 4A - Thursday, March 21, 2019

(All the following times are AM!)

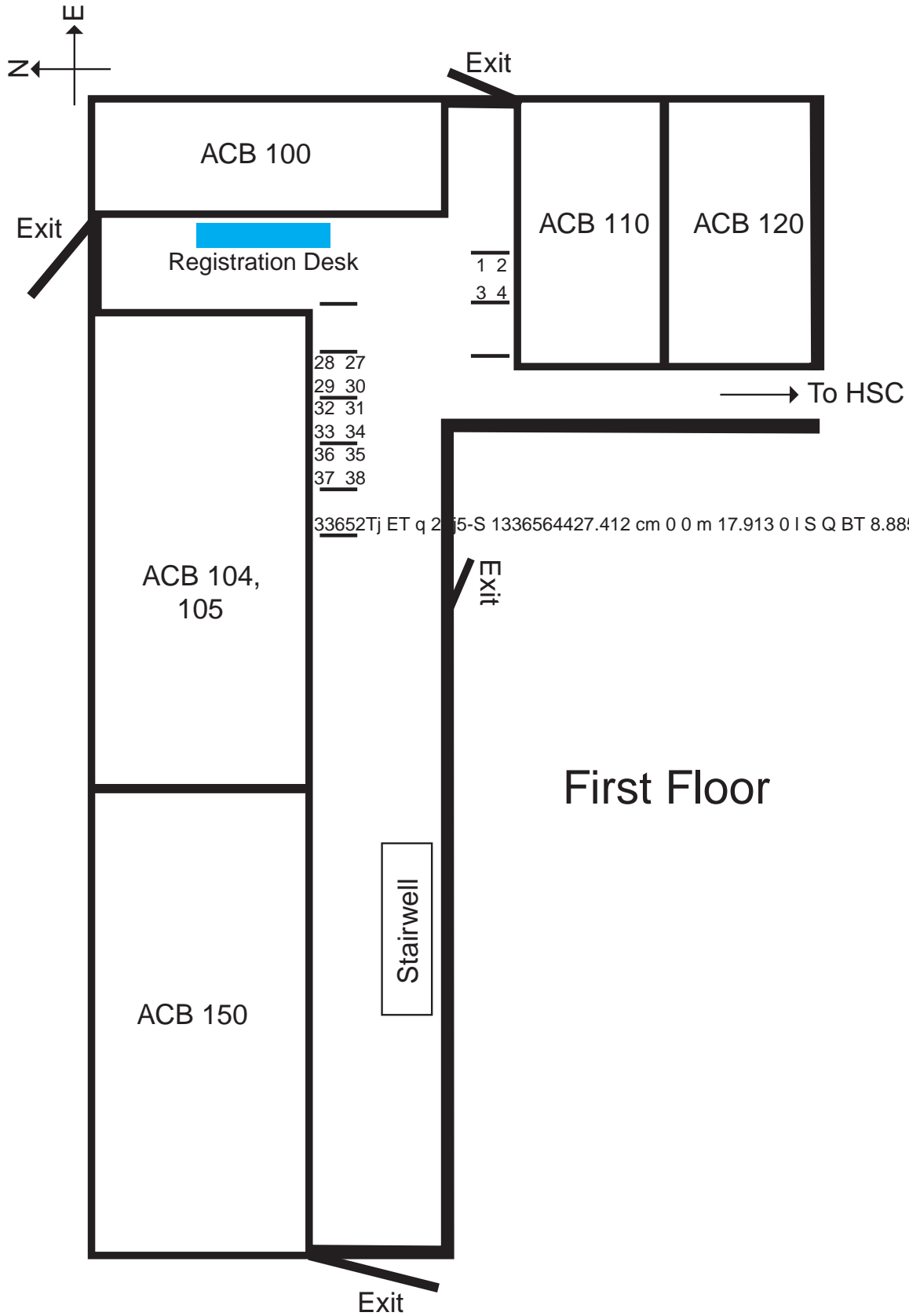
Poster	Time	Name
TH31	9:00-9:15	
TH32	9:15-9:30	Burroughs, Chelsea
TH33	9:30-9:45	Deleon, Sabrina
TH34	9:45-10:00	Esquivel, Esteban
TH35	10:00-10:15	Cox, Quincy
BREAK		
TH36	10:30-10:45	Slate, Rachel
TH37	10:45-11:00	Ali, Fahad
TH38	11:00-11:15	Parikh, Niki
TH39	11:15-11:30	Ruppert, Misty
TH40	11:30-11:45	Foley, David

Judging Group 5A - Thursday, March 21, 2019

(All the following times are AM!)

Poster	Time	Name
TH41	9:00-9:15	
TH42	9:15-9:30	Jacob, Daron
TH43	9:30-9:45	Mitchell, Diana
TH44	9:45-10:00	Pillutla, Pragna
TH45	10:00-10:15	Tsen, Adam
TH46	10:15-10:30	Stamps, David
BREAK		
TH47	10:45-11:00	Smith, Jessica
TH48	11:00-11:15	Pedroza, Diego
TH49	11:15-11:30	Reese, Britney
TH50	11:30-11:45	Anderson, Trevor

POSTER LOCATIONS





GRADUATE STUDENTS YEARS 1-2

GS1-2 ANDERSON, TREVOR

Expression and Characterization of Soluble Epitope-Derived Major Histocompatibility Complex (MHC) from Stable Eukaryotic Cell Lines

Wooster, Amanda; Anderson, Trevor; Lowe, Devin

The increased scientific understanding of CD8+ T cells under both normal and diseased states can be largely attributed to the utilization of MHC class I-specific reagents such as fluorescently-labeled multimers (e.g., tetramers). Typically, these recombinant MHC class I-specific reagents are produced in bacteria following a lengthy purification protocol requiring additional non-covalent folding steps with exogenous peptide to permit complete molecular assembly. We have developed an alternative and more rapid approach to generating soluble and functional MHC class I molecules in eukaryotic lines such as CHO cells. This methodology results in the development of stable cell lines that reliably secrete epitope-derived MHC class I proteins into the tissue media for convenient purification and downstream modifications that include biotinylation and multimerization. Overall, the entire MHC class I complex is covalently linked, permitting loading of user-defined peptides with various functionalities that can specifically engage a diverse set of CD8+ T cells. Additionally, these eukaryotic-derived MHC molecules may more accurately recapitulate binding dynamics with CD8+ T cells in relevant assays.

School: Graduate School of Biomedical Sciences | Campus: Abilene

GS1-2 BISHYA, JIWASMIK

Identification of Defensive Mechanisms in *Pseudomonas aeruginosa* Enabling Survival in Polymicrobial Growth with Fungi

J. Baishya, B. Perez, M. Zinah, J. P. Morris, K. P. Nguyen, C.a. Wakeman

Microbial communities are an amalgam of different species of microorganisms where some members of the community occupy overlapping niches. These microorganisms attempt to outcompete each other to reduce competition in terms of limited nutrients and space via secretion of a range of molecules. The functions of these molecules can range from being toxic (actively killing off competitors) to being protective (shielding the producer from anti-microbials) to enabling resource scavenging (potentially starving out competitors). The nature of these secreted molecules and interspecies interactions dictate the stability of microbial communities and, in some cases, the severity of disease within human hosts. In that direction, our lab is interested in identifying the genes encoding defensive molecules in Gram-negative bacterium *Pseudomonas aeruginosa* in response to fungal species it may encounter within the various environmental or infectious niches it occupies. *P. aeruginosa*, commonly isolated from soil and water habitats, is known to produce a plethora of virulent anti-microbials. However, not much is known about the defensive molecules it produces to protect itself from toxic molecules secreted by neighboring competitors. In our experiments, we have used GFP-labeled *Cryptococcus neoformans* as our model for discovering *P. aeruginosa*'s defensive molecules via its interaction with the fungi. The soil fungus *C. neoformans*, known as the causative microbe for meningitis in immunocompromised human hosts, produces toxic molecules against human hosts and as well as microbial species. For our studies, we have co-cultured *C. neoformans* with a commercially available transposon-mutant library of *P. aeruginosa* to identify genes necessary for competitive growth. Mutants of *P. aeruginosa* depicting reduced growth in the primary screening have been subjected to secondary screening to further determine the requirement of the identified gene in *P. aeruginosa*'s defensive mechanisms. On

School: Texas Tech University | Campus: Lubbock

GS1-2 BROWN, TIMOTHY

The lactate receptor Gpr81 on non-cancer cells promotes an immunosuppressive phenotype in the tumor microenvironment

Timothy Brown, Sabarish Ramachandran, Vadivel Ganapathy

Cancer cells display a unique phenomenon in which, even in the presence of oxygen, cells switch from oxidative phosphorylation to glycolysis as the primary source of ATP with consequent production of lactic acid. This phenomenon, called the Warburg Effect, is a hallmark of cancer. Lactic acid has long been considered as the necessary end product of this metabolic switch, and lactic acid is effluxed out of tumor cells to prevent intracellular acidification.

GS1-2 ELLEN, CHRISTOPHER

Environmental and Physiological impacts on Assisted Reproductive Technologies

C.Ellen, S. Prien, L. Penrose

Looking to improve success rates of assisted reproductive technologies in humans and with the increasing number of reports indicating that environmental factors may be influencing reproductive capabilities, a chart review study was conducted to see how urban and rural environments affect a patient's response to assisted reproductive technologies. This was in follow-up to a previous study with this clinic population which demonstrated differences in semen parameters between urban and rural populations. In Vitro Fertilization (IVF) reports from 2014 to 2017 were analyzed to look for potential effects. To look for potential impacts, patients' semen was assessed pre-wash and post-wash by comparing volume, concentration, and motility. Female patients were assessed by looking at the number of oocytes recovered and subsequently fertilized by either IVF or Intracytoplasmic Sperm Injection (ICSI). Finally, embryos were assessed by comparing development, stage and grade. Results from male patients continue to show differences between urban and rural environments ($P < 0.05$), while in female patients only the number of oocytes recovered show a significant difference between rural and urban populations ($p < 0.01$). Oocytes fertilized, embryo development, stage and grade did not show a difference between urban and rural populations ($P = 0.241$). While data continue to support the impact of resident location on male fertility parameter, no such relationship was seen for female factors or embryo quality. Data for pre-outcomes is pending.

School: Texas Tech University | Campus: Lubbock

GS1-2 ENRIQUEZ, JOSUE

T cell-mediated bone marrow and splenic hypoplasia in a mouse model of acute graft vs. host disease

Josue Enriquez, Brianyell McDaniel Mims, Kathryn Furr and Matthew Grisham

A major limitation with use of hematopoietic stem cell transplantation to treat relapsing/ refractory hematological malignancies is the development of a potentially lethal, multi-organ inflammatory disorder called acute graft versus host disease (aGVHD). Acute GVHD-associated bone marrow (BM) suppression and lymphoid tissue (LT) hypoplasia creates protracted immunodeficiency that greatly increases the risk of infections, bleeding and death. Objective: We wish to determine the role that allogeneic CD4+ T cells play in a mouse model of aGVHD-associated BM and LT aplasia that does not require lethal myeloablative conditioning. Methods: Allogeneic CD4+CD25- T cells (0.5×10^6 cells) obtained from B16-H2-Ab1bm12 (B16-BM12) donor mice were adoptively transferred into sub-lethally irradiated C57Bl/6J (B16) recipients. Mice were monitored daily for clinical signs of aGVHD. Results: Adoptive transfer of allogeneic but not syngeneic T cells induced a time-dependent loss of survival and remarkable reductions of cellularity in the BM and spleen. Virtually all mice engrafted with allogeneic T cells developed severe anemia at 15 days post-transfer. Flow cytometric analyses revealed dramatic and significant losses of CD4+ T cells, myeloid cells and NK cells in the BM and spleen indicating aGVHD-mediated BM suppression and spleen hypoplasia. Interestingly, we observed little or no immune cell infiltration in the lungs, liver and skin of allogeneic engrafted recipients and no evidence of disease in any tissue of mice engrafted with syngeneic T cells. These data suggest that the major target tissues in this model of aGVHD are BM and spleen. Conclusions: When taken together, these data demonstrate that adoptive transfer of allogeneic CD4+ T cells into sub-lethally irradiated recipients induces aGVHD-associated immunodeficiency.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 GEORGE, ELIZABETH

A Meta-Analysis on Diet Interventions, Regular Exercise and Better Lifestyle Factors to Delay the Progression of Dementia Elderly Individuals

Elizabeth George, P. Hemachandra Reddy

This study assesses the impact of healthy diets and regular exercise on dementia in elderly individuals and patients with early Alzheimer's disease (AD). Our presentation outlines strong evidence for various modifiable risk factors associated with the reduced risk of dementia. Currently, health care costs for the 50 million people with AD are about \$818 million and are projected to be \$2 billion by 2050. Unfortunately, there are no drugs currently available that can delay and prevent progression of disease in elderly individuals and in patients with Alzheimer's. The two key pathological hallmarks of the neurodegenerative disease are extracellular amyloid deposits and intracellular neurofibrillary tangles. Loss of synapses and synaptic damage are largely correlated with cognitive decline in Alzheimer's disease patients. This presentation also highlights major sites affected by AD. Synaptic damage and mitochondrial dysfunction are presented in early events of AD pathogenesis. Only about 1% of total AD patients can be explained by causal factors. Mutations in APP, PS1, and PS2 have been identified as genes involved in early onset AD. Several risk factors have been identified, such as Apolipoprotein E4 genotype, type 2 diabetes, traumatic brain injury, depression and hormonal imbalance are reported to associate with late-onset sporadic AD. Strong evidence reveals antioxidant enriched diets and regular exercise reduces toxic radicals, enhances mitochondrial function and synaptic activity improves cognitive function in elderly populations. Current available data on the use of antioxidants in transgenic mouse model AD and antioxidant(s) supplements in diets of elderly individuals were investigated. The use of antioxidants in randomized clinical trials in AD patients was also critically assessed. This presentation discusses the current status of healthy diets and regular exercise on dementia in elderly individuals.

School: Texas Tech University | Campus: Lubbock

GS1-2 HERNANDEZ, SARAH

Regulation of alpha-Synuclein Expression at the Ribosome

Sarah Hernandez, Kristen Baca, Elena B. Tikhonova, Andrey L. Karamyshev

Intracellular aggregation of alpha-synuclein (aSyn) is associated with many neurodegenerative diseases, such as Parkinson's disease (PD). Despite many studies on aSyn, the mechanism by which it aggregates is still unknown. Our hypothesis is that alteration of interacting partners during translation leads to misfolding and aggregation of aSyn, causing disease. In PD, this alteration of interacting partners can be due to a mutation in aSyn itself (familial PD) or by defects in the interacting partners (sporadic PD). A major goal of this study is to use a candidate approach to identify possible interacting partners during translation of wild type and mutated aSyn. Candidates will include proteins or complexes that are involved in translation at the ribosomal level, such as the signal recognition particle (SRP), Hsp70, TRiC/CCT, etc. SRP is also involved in the Regulation of Aberrant Protein Production (RAPP) Pathway, where it functions with its counterpart, Ago2, to control the expression of misfolded proteins. We found that knocking-down SRP54, the nascent-chain binding subunit of SRP, affects both mRNA and protein expression of aSyn. Our results suggest that the targeting factor, SRP, and the RNA-silencing factor, Ago2, are involved in aSyn regulation, possibly at the level of translation. Determining co-translational interacting partners of aSyn is key in discerning the causes of aggregation and developing therapies against it.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 KATZ, COURTNEY

Tryptophan Fluorescence to Monitor Drug Binding in P-glycoprotein

Courtney Katz, Ben Jackson, Joachim Weber, Ina Urbatsch

P-glycoprotein (Pgp) is classi

GS442409 KORAC, KSENIJA, BRIGHT, JENNIFER D., ELIZONDO, RICCAY, AND BRIGHT, ROBERT K. (2016) THE POTENTIAL ROLE OF SIRT1 DEACETYLASE IN D52 VACCINE INDUCED TUMOR IMMUNITY. *Journal of Cellular Biochemistry*, 121(1), pp. 1-10. doi:10.1002/jcb.24811

Potential Role of SIRT1 Deacetylase in D52 Vaccine Induced Tumor Immunity

Ksenija Korac, C. Riccay Elizondo, Jennifer D. Bright, and Robert K. Bright

Vaccine induced immunity against tumor-self antigen D52 has proven to be promising against cancer without inducing autoimmunity. CD8+ T-cells that are elicited against tumor-self antigen D52 by vaccination have the ability to recognize cancer cells but not healthy cells that also express this self-antigen. Lysine deacetylases are enzymes that catalyze the removal of acetyl groups from lysine residues. The oncogenic tumor self-antigen D52 contains 19 lysine residues evenly distributed throughout the protein. We hypothesize that modification of amino acid residues within D52 differs between tumor cells and normal cells which affects the recognition of D52 (and the tumor cells) by CD8+ T-cells that are D52 specific. This leads to emergence of pMHC I neo-ligands within D52 expressed by cancer cells. *Journal of Cellular Biochemistry*, 121(1), pp. 1-10. doi:10.1002/jcb.24811

GS1-2 MAY, JORDAN

Effect of Trichuris co-infection on Sm-p80-based vaccine in baboons

Jordan May, Adebayo Molehin, Weidong Zhang, Juan Rojo, Jasmin Freeborn, Justin Sudduth, Parth Patel, Afzal A. Siddiqui

Schistosomiasis is a Neglected Tropical Disease (NTD) caused by infections with the parasitic helminth *Schistosoma* in humans. To date, the vaccine antigen *Schistosoma mansoni* antigen (Sm-p80) has been shown to confer both prophylactic and therapeutic immunity in experimental models of schistosomiasis. Sm-p80 vaccine is now being developed under good manufacturing practices in preparation for Phase 1 human clinical trials later this year. Our previous vaccine trials of Sm-p80 have utilized standard strategies of vaccine administration to naive animals followed by schistosome cercarial exposure to evaluate the prophylactic efficacy. However, people living in schistosomiasis-endemic regions do suffer from other concomitant parasitic helminth infections. In this present study, we aimed to evaluate the efficacy of Sm-p80 vaccine formulated in Glucopyranosil Lipid Adjuvant Stable Emulsion (GLA-SE) against *S. mansoni* infections in baboons co-infected with a soil-transmitted helminth, *Trichuris trichiura*. We also investigated molecular mechanisms and epistatic interactions associated with co-morbidity and vaccine response using systems biology approaches. Data obtained from this study, evidenced by worm and tissue egg burden, showed that Sm-p80 vaccine efficacy was significantly impaired in baboons with *Trichuris* co-infection when compared to those infected with *S. mansoni* alone. Preliminary analyses of the RNA sequencing data revealed unique differentially expressed genes (DEGs) and canonical pathways that may be associated with the loss of protective vaccine efficacy in the baboons with *Trichuris* co-infection. These DEGs could be used as markers predictive of vaccine efficacy or the loss of it and, overall, our study provides critical points of consideration in the field deployment and efficacy testing of not only schistosomiasis vaccine antigens but other vaccines as well.

School: Texas Tech University | Campus: Lubbock

GS1-2 MAZZITELLI, MARIACRISTINA

Group II metabotropic glutamate receptors, particularly mGluR2, in the amygdala regulate sensory and affective responses in a rodent model of arthritis pain

Mariacristina Mazzitelli and Volker Neugebauer

Pain is a multidimensional experience with an important aversive-affective dimension. The amygdala plays a critical role in the emotional-affective aspects of behaviors and in pain modulation. The central nucleus of amygdala (CeA) serves major output functions and neuroplasticity in the CeA is mechanistically linked to pain-related behaviors in different pain conditions. The activation of Gi/o-coupled group II metabotropic glutamate receptors (mGluR2 and mGluR3) can decrease neurotransmitter release and regulate synaptic plasticity. Evidence from preclinical studies suggests that mGluR2/3 may be a target for neuropsychiatric disorders as they can inhibit pain-related processing and behaviors. The contribution of mGluR2 and mGluR3 in the amygdala to pain-related behaviors remains to be determined.

Audible and ultrasonic vocalizations, and mechanical withdrawal thresholds were measured in normal and arthritic rats (5-6 h after induction of a mono-arthritis in the left knee joint with intra-articular kaolin and carrageenan). Systemic application (before behavioral testing) of a group II mGluR agonist (LY379268 disodium salt) decreased the vocalizations and increased the spinal reflex thresholds of arthritis rats. To determine the contribution of mGluRs in the amygdala, a group II mGluRs antagonist (LY341495 disodium salt), a positive allosteric modulator for mGluR2 (PAM, LY487379 hydrochloride), or a negative allosteric modulator for mGluR2 (NAM, VU6001966) was applied stereotaxically into the right CeA by microdialysis. Blockade of mGluR2 with LY341495 or VU6001966 in the CeA reversed the effects of a systemically applied group II mGluR agonist. Activation of mGluR2 with LY487379 in CeA mimicked the effect of the systemically applied group II mGluR agonist in arthritis rats.

These results suggest that group II mGluRs, and particularly mGluR2, in the amygdala can regulate pain-related behaviors and play a major role in the effects of systemic group II agonists.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 OLIVER, DARRYLL

Mitochondrial and Biomolecular Pathogenesis of Alzheimer's Disease

Darryll Oliver; P. Hemachandra Reddy

Alzheimer's disease (AD) is the most common form of dementia, and is characterized by progressive loss of memory, particularly short-term and working memory, and cognitive function. For aging populations, particularly those with high prevalence of obesity, metabolic disorder, and diabetes, susceptibility to AD is of major concern. AD is recognized to develop either as early-onset or familial AD (FAD), or late-onset or sporadic AD (SAD). Histopathological examination of postmortem AD brains reveals proliferation of Amyloid-Beta (A β) and Phosphorylated-Tau (P τ) toxic proteins in affected regions of the brain. Significant contributors to FAD include mutations in PS1 and PS2 loci of the Secretase gene, and APP which cleaves to form toxic A β . AD is induced by: the ApoE4 genotype, as well as polymorphisms in several gene loci, traumatic brain injury, stroke, metabolic syndrome, obesity, type-2-diabetes, and age related factors; especially oxidative stress and mitochondrial dysfunction. This presentation examines the factors that induce AD pathology, particularly molecular components contributing to mitochondrial dysfunction. Recent developments in understanding of healthy and diseased mitochondrial structure, function, physiology, dynamics, and mitochondrial DNA will be highlighted pertaining to environmental, and genetic factors contributing to early and late onset AD.

School: Texas Tech University | Campus: Lubbock

GS1-2 REESE, BRITNEY

Polymorphism on Codon 72 of p53 Gene Alters Immunity through Altered Macrophage Polarization.

Britney M Reese, Shanawaz M Ghose, Bhaumik Patel, Jun Hung Cho, Magdalena Karbowniczek, Maciej Markiewski

A common single nucleotide polymorphism in the tumor suppressor gene p53 occurs at codon 72. There are two variants of this codon: a proline (P72) and an arginine (R72). Several groups have linked this polymorphism to increased risk of cancer, diabetes and metabolic diseases, however the effects of this polymorphism on immunity remains unclear. We hypothesize that this polymorphism may impact macrophage activation because mice that carried R72 of a humanized replica of Tp53 had impaired response to LPS challenge. To investigate the effects of this polymorphism on inflammatory activities of macrophages, we used a human p53 knock-in (Hupki) mouse model, in which bone marrow-derived macrophages were homozygous for either P72 or R72. When these macrophages were stimulated with either LPS or IL-4 to induce macrophage polarization, we found that macrophages that carry R72 are reluctant to become classically activated macrophages (M1) as demonstrated by the altered expression of M1 genes and reduced IL-12 expression. Mechanistically, reduced ability of R72 macrophages to become M1 cells was driven by decreased NF- κ B transcriptional activity demonstrated by reduced NF- κ B nuclear translocation and reduced NF- κ B binding to p53 in R72 cell compared to P72 cells. We theorize that these defects in immunity may contribute to increased risk of cancer in individuals carry R72 because tumor associated macrophages that play a pivotal role in cancer progression are immunosuppressive as a result of their inability to become M1 cells.

School: Graduate School of Biomedical Sciences | Campus: Abilene

GS1-2 SCHAUBHUT, ALEXSANDRA

Specific Gravity Device Can Predict Bovine Embryo Sex

Cara Wessels, Lindsay Penrose, Alex Schaubut, Sam Prien

Objective: The objective of this study is to determine if a Specific Gravity Device (SGD) can predict bovine embryo sex.

Design: Lab based trial of experimental device

GS1-2 SCHNIERS, BRADLEY

PEPT1 as a tumor promoter and novel drug target to treat pancreatic cancer

Bradley K. Schniers, Yangzom D. Bhutia

Pancreatic ductal adenocarcinoma (PDAC) is the most lethal of all cancers. Gemcitabine is currently used as the therapy but with a very low success rate. With this projection in mind, it is imperative to discover a more effective treatment for PDAC. Our lab works on the Peptide Transporter 1 (PEPT1)/SLC15A1, which is expressed in the small intestine, kidney, and bile duct. PEPT1 transports a wide array of di- and tri-peptides and peptide-like drugs. Literature evidence has shown PEPT1 to be upregulated in some PDAC cell lines. Our aim was to corroborate the literature evidence, then investigate if PEPT1 is a tumor promoter and finally understand the mechanistic aspect of its upregulation. Using quantitative PCR and Western blotting, we checked the expression of PEPT1 mRNA and protein. PEPT1 was selectively and significantly upregulated in cancer cells. Additionally, we performed radiolabeled glycylsarcosine (3H-Gly-Sar) uptake to check the functionality of PEPT1. The results of 3H-Gly-Sar uptake correlated with the protein expression in the cancer cells. It is known that tumor cells generate large amounts of lactic acid due to accelerated aerobic glycolysis. Since PEPT1 is a proton-coupled transporter we hypothesized that lactate regulates its expression. To test this, we performed RT-PCR to check the expression of Pept1 in Gpr81/wildtype and Gpr81/knock-out intestinal samples. Surprisingly, we found that lactate/GPR81 complex regulates PEPT1 expression. Further, we found that lactate also increases the expression of MMP-1, which breaks down the extracellular matrix protein collagen into large peptides. These peptides could be further hydrolyzed into dipeptides by DPP-IV/CD26, which could be the mechanism to generate dipeptide substrates for PEPT1 and then couple the process to amino acid nutrition for pancreatic cancer cells. In summary, PEPT1 promotes pancreatic cancer and could be used as a drug target to treat PDAC.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 YOUNG, VICTORIA

Conformational Changes in the Na/K Pump First Loop

Victoria C. Young, Pablo Artigas

P-type 2 ATPases are active transporters that establish membrane gradients across all cell types. Subfamily members, sarcoplasmic endoplasmic reticulum Ca²⁺-ATPase (SERCA) and Na,K-ATPase (NKA), share structural similarities with an alpha catalytic subunit containing 10 transmembrane spanning regions (TM1-TM10) and a similar catalytic cycle, where both transit through cytoplasmic-facing E1 states and external-facing E2 states (which alternate between phosphorylated and dephosphorylated). Despite their similarity, E1 and E2 structures show that the TM1-TM2 region of SERCA moves inwardly in E1, a movement absent in NKA structures. To investigate the movement of NKA, the TM1, TM2 and their connecting loop (L1-2), individual residues (from TM1, Q124 to TM2, L130), were individually mutated to a Cys; concurrently, a conserved Arg residue at 977 was also mutated to a Cys. We expressed these double Cys mutations in *Xenopus* oocytes, and used two-electrode voltage clamp to measure effects of disulfide bond formation on pump current (IP, activated by 10 mM K in 125 mM tetramethylammonium without Na) and the transient charge movement (QNa, in 125 mM Na without K) which reports the E2P → E1P(3Na) conformational change. Several double Cys mutants showed reduced IP and altered QNa in the presence of an oxidizing agent, indicating crosslinking and one crosslinked in E2P. Movement of the TM1-TM2 region was further investigated using voltage-clamp fluorimetry. The fluorophore tetramethylrhodamine maleimide (TMRM) was introduced at R977C and L1-2 residues were individually mutated to Trp. Quenching of TMRM when Trp is ~5.5 Å away was used to follow state-dependent changes in distance. With TMRM in the external-most section of TM2, quenching in the presence of Na was observed in the E2P state (positive voltages), which demonstrates that the TM1-TM2 regions moves outward (toward R977) in E2 states, and inward (away from R977) in E1 states.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GRADUATE STUDENTS 3+ YEARS

GS3+ ALQAHTANI, ADULAZIZ

Recombinant S5 pyocin: A novel therapy for *Pseudomonas aeruginosa* infection

Abdulaziz Alqahtani, Randal Jeter, Jane Colmer-Hamood, Abdul Hamood

Complex wounds occur in the setting of chronic diseases such as venous insufficiency and diabetes and include vascular, diabetic, and pressure ulcers, and non-healing surgical wounds. Within chronic wounds, infecting bacterial pathogens often exist in protein structures termed biofilms. *Pseudomonas aeruginosa* is one of the most common bacteria isolated from chronic wounds. The multidrug resistance of *P. aeruginosa* combined with the high cost of producing new antibiotics necessitates the search for alternative therapies. One such therapy is the utilization of pyocins, which are narrow-spectrum antimicrobials produced by *P. aeruginosa* to eliminate other competing bacteria. The colicin-like S-type pyocins are simple proteins that have different killing domains. Pyocin S5 is a 56-kDa pore forming enzyme that kills its target bacterium through membrane damage leading to leakage of intracellular compounds. In this study, we produced and purified recombinant pyocin S5 (rS5) and examined its inhibitory effect on strains produced by *P. aeruginosa* S5 sensitive strains. Using suitable primers, we synthesized a 1497-bp fragment carrying the intact open reading frame. The fragment was cloned in-frame in the *E. coli* expression vector pBAD-TOPO and the cloning was confirmed by nucleotide sequence analysis. Through a standard expression protocol, we overproduced rS5, purified by nickel-nitrilotriacetic acid affinity column chromatography, and confirmed the purification with SDS-PAGE. Using the zone of inhibition assay and rS5, we screened 51 *P. aeruginosa* clinical isolates: 7 were completely sensitive, 23 were partially sensitive, and 21 were resistant. The minimum inhibitory concentration for the rS5 sensitive strain CF2351 was 30 µg/mL. At a concentration of 300 µg/mL, rS5 eliminated mature biofilm formed by CF2351. These results suggest that rS5 could be effective in eliminating *P. aeruginosa* rS5 sensitive strains from an infected wound.

School: Texas Tech University | Campus: Lubbock

GS3+ BEASLEY, KELLSIE

Potential *Pseudomonas aeruginosa* regulatory proteins, including LasR, bind to the upstream region of the phenazine operon.

Kellsie Beasley, Jane Colmer-Hamood, and Abdul Hamood

Pseudomonas aeruginosa is a Gram-negative opportunistic pathogen that causes bloodstream infections leading to sepsis and septic shock. A major *P. aeruginosa* virulence factor is pyocyanin, which is synthesized by different enzymes encoded by the phenazine operon (phz). Pyocyanin production is regulated by cell density-dependent quorum sensing (QS) transcriptional regulators such as LasR. Upon its activation by the autoinducer N-(3-oxododecanoyl)-L-homoserine lactone (3OC12-HSL), LasR binds to and activates its target genes. Using multiple transcriptional studies (qRT-PCR and transcriptional fusion analyses), we recently showed human serum significantly enhances the expression of phz and QS genes at late stages of growth. We hypothesize that this regulation occurs through a serum-influenced positive or negative transcriptional regulator(s) that specifically binds to the phz upstream region (phz-UR). Such a regulator has not yet been identified at this time. Using DNA gel shift assays, we detected a specific shift band (SGSB) when we incubated the phz-UR probe with the lysate of an *Escherichia coli* strain carrying a lasR overexpression plasmid (DH5alpha/pECP8) that was grown in the presence of 3OC12-HSL. However, incubating the lysate of DH5alpha/pECP8 with a 15-bp probe containing one of two potential LasR binding sites within the phz-UR produced no SGSB. The phz-UR probe produced a SGSB when incubated with the total membrane, but not the clear lysate, of PAO1 that was grown in Luria-Bertani broth (LBB). In addition, the growth of PAO1 in LBB supplemented with human serum (LBBS) altered the migration of this band. Furthermore, we detected the same SGSB when we utilized the membrane fraction of the PAO1 lasR deletion mutant. These results suggest that: 1) upon its activation by 3OC12-HSL, LasR specifically binds to the phz-UR; 2) the membranes of PAO1 contain a LasR-unrelated phz-UR binding protein; and 3) serum influences this binding.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ BLANTON, HENRY

Effects Of Cannabinoid Receptor Agonists On Ovarian Cancer Cell Xenografts Growth In Mice

Henry Blanton, Jennifer Lilley, Jennifer Brelsfoard, Jose-Luis Redondo, Isabel Castro, Kevin Pruitt, Josee Guindon

Ovarian Cancer is the fifth most common, and deadliest cause of gynecologic cancer among women, with projected cancer care associated costs reaching \$173 billion in the US by 2020. There is an urgent need for novel analgesics to treat cancer-related chemotherapy-induced chronic pain. The therapeutic use of cannabinoid-based therapies by cancer patients for their analgesic and antiemetic properties has been increasing, but the impact of long term cannabinoid-based therapies on tumor growth in the context of chemotherapy-treatment and/or cancer remains to be determined. Here we examine the anti-nociceptive effects of cannabinoid receptor agonists on chemotherapy-induced peripheral neuropathy and the effect of chronic cannabinoid agonist administration on tumor growth. Our results suggest that non-intoxicating cannabinoid receptor 2 (CB2) agonists are effective in treating neuropathic pain resulting from chemotherapy treatment. Unfortunately, our results also suggest CB2 agonists may enhance tumor growth through a hormonally-mediated mechanism. When compared to vehicle treated controls, mice treated with CB2 agonists showed larger tumor sizes, increased estradiol and marked changes in normal progression through the estrous cycle. This study supports the need for in vivo preclinical studies to improve our understanding and investigate further interactions between the endocannabinoid and hormonal system which should be carefully considered in the context of cancer treatment.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ ELIZONDO, RICCAY

Characterization of CD8+ T cells elicited by tumor-self antigen D52 vaccination

C Riccay Elizondo, Jennifer D Bright, Robert K Bright

Cancer immunotherapy is a powerful treatment tool. The next generation approach is led by vaccination against overexpressed tumor-self antigens. In preclinical studies, vaccination against the tumor-self antigen D52 (D52) has been promising. However,

GS3+ ELMASSRY, MOAMEN

Novel markers for sepsis in *Pseudomonas aeruginosa* infected severely burned patients

Moamen Elmassry and Nithya Mudaliar and Jane Colmer Hamood and Michael San Francisco and John Griswold and Sharmila Dissanaik and Abdul Hamood

Sepsis—life-threatening organ dysfunction that may include kidney failure, cardiac abnormalities, and respiratory distress—lead to hospitalization of one million individuals in the US annually with a death rate of about 200,000. Sepsis in trauma patients usually accompanied by bloodstream infection, often with Gram-negative bacteria such as *Pseudomonas aeruginosa*, which is frequently multidrug-resistant. We recently showed that, compared to its growth in whole blood from healthy volunteers, *P. aeruginosa* grown in whole blood from severely burned patients (SBP) significantly altered the expression of many of its genes in response to changes in levels of blood metabolites. We hypothesized that some host metabolites would be significantly reduced by bacterial consumption while bacterial metabolites would significantly increase during *P. aeruginosa* sepsis. Such alterations may serve as early markers for *P. aeruginosa* sepsis in SBP. We tested this hypothesis using the murine model of thermal injury, which mimics closely *P. aeruginosa* sepsis in SBP. Adult mice were thermally injured only or thermally injured and infected with *P. aeruginosa* and serum samples were collected after 24 hours. The levels of 531 metabolites within each sample were determined using gas chromatography time-of-flight mass spectrometry. Compared with thermal injury only, the levels of 15 metabolites were significantly increased (including thymidine, thymine, uridine, uracil, malic and succinic acids, trans-4-hydroxyproline, oxoprolin, glucose-6-phosphate) and those of 8 metabolites (including methionine, tyrosine, indole-3-acetate and indole-3-propionate) were significantly reduced in injured/infected mice. We suggest that some of these metabolites may serve as novel biomarkers for early diagnosis of sepsis in burn patients caused by *P. aeruginosa*.

School: Texas Tech University | Campus: Lubbock

GS3+ HEIN, MATTHEW

Kappa opioid receptor mediated disinhibition of amygdala CRF neurons

Matthew Hein, Vadim Yakhnitsa, Guangchen Ji, Edita Navratilova, Frank Porreca, Volker Neugebauer

Neuroplastic changes in the central nervous system have been implicated not only in pain conditions associated with acute injury, but also in functional pain syndrome (FPS), in which the pain cannot be attributed to tissue pathology. Mechanisms of FPS remain to be determined, but these conditions are typically triggered by stress, which can advance the pain condition from episodic to chronic. Corticotropin releasing factor and its CRF1 receptor in the amygdala have been linked to emotional-affective behavior and pain modulation. The amygdala is also a major site of opioid receptors, including G_{i/o}-coupled kappa opioid receptors (KOR). KOR activation by its endogenous ligand dynorphin or agonists can have adverse effects and oppose mu-opioid receptor-mediated actions. Here we tested the hypothesis that KOR activation disinhibits CRF neurons in the central nucleus (CeA) in uninjured rats. CeA serves major amygdala output functions.

Brain slice electrophysiology was used to determine the effects of a KOR agonist (U-69,593) on CRF-CeA neurons. To visualize these neurons, AAV-EF1a-DIO-mCherry was injected into the right CeA of transgenic CRF-Cre rats (4 weeks old). To allow optical activation of glutamatergic afferent input from the lateral parabrachial area (LPB), AAV5-ChR2-CaMKII-eYFP was injected into the LPB. Animals were allowed to recover for two to six weeks for viral expression. Whole-cell patch-clamp recordings of CRF-CeA neurons were used to measure neuronal excitability, evoked excitatory and inhibitory synaptic currents (EPSCs and IPSCs), paired pulse facilitation evoked by optical (LPB) or electrical (basolateral amygdala) stimulation, and spontaneous and miniature EPSCs and IPSCs. U-69,593 decreased glutamate driven IPSCs but had no effect on EPSCs or on excitability. The data suggest that KOR activation under normal conditions leads to synaptic disinhibition of CRF-CeA neurons, which could result in increased pain- and anxiety-like behavior.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ MACHA, SHAWN

Constitutive DNA damage in cancer cells with the alternative lengthening of telomeres (ALT) phenotype sensitizes ALT cancer cells to



GS3+ MUELLER, KARL

The Effects of C-Peptide Produced by Genetically Engineered Sertoli Cell on Endothelial Cells Damage Related Molecules in Hyperglycemic Environments

Karl Mueller, Jannette M Dufour

Hyperglycemia caused by type 1 or type 2 diabetes causes a phenotypic change in endothelial cells towards a vasoconstrictive, prothrombotic and pro-inflammatory environment. This endothelial dysfunction plays a critical role in the pathogenesis of diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, and atherosclerosis. C-peptide, a coproduct of the insulin gene has been shown to have molecular and physiological effects on endothelial cells in type 1 diabetes, however, it is not present in current insulin replacement therapy. Our lab uses genetically engineered immune privileged Sertoli cells as a vehicle to deliver the insulin gene. An adenoviral vector containing the insulin gene with furin proteolytic cleavage sites was used to engineer neonatal porcine Sertoli cells (NPSC) to express insulin and C-peptide. We tested the effects of our engineered Sertoli cells (ESC) vs C-peptide (CP) or unengineered Sertoli Cell media alone (SC) on various genes endothelial cell genes in vitro, using high glucose and normal glucose controls. Our data demonstrate that C-peptide has a significant decrease in cellular adhesion molecules ICAM-1, VCAM-1 and P-selectin. C-peptide also shows significant decreases in the vasoactive substances endothelin, and von Willebrand factor, and plasminogen activator inhibitor-1. These data make evident the beneficial effects of C-peptide generated by Sertoli cells on endothelial damage related molecules in vitro, and also demonstrate the potential of this treatment for diabetic cardiovascular disease.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ PEDROZA, DIEGO

PGRMC1 influences breast cancer growth and progression by altering key molecular pathways

Diego A Pedroza, Ramadevi Subramani, Adriana Galvez, Alejandra B Bencomo, Rajkumar Lakshmanaswamy

Introduction: Increased expression of the progesterone receptor membrane component 1 (PGRMC1), a protein with the ability to interact and stabilize epidermal growth factor receptor (EGFR) is overexpressed in breast cancer tissue. Mechanism by which PGRMC1 influences breast cancer remains largely unknown. We, aim to investigate the signaling mechanisms of PGRMC1 in breast cancer cells.

Materials and Methods: A panel of non-malignant and malignant breast cell lines were cultured and screened for PGRMC1 expression. PGRMC1 overexpressing breast cancer cell lines were treated with AG-205 (PGRMC1 inhibitor) and siRNAs targeting PGRMC1. MTS, qRT-PCR, Western blot, immunofluorescence, flow cytometry and phosphor explorer antibody array, were performed.

Results: Increased PGRMC1 mRNA and protein levels were observed in ZR-75-1 and MDA-MB-468 cells, these results were validated and compared to online RNA-seq based gene expression analysis of breast cell lines and breast tumor data sets. Gene databases demonstrated that PGRMC1 is overexpressed in multiple breast cancer subtypes. IHC, demonstrated strong staining for PGRMC1 in human breast cancer tissue compared to normal tissue. Treatment with both AG-205 and silencing PGRMC1 decreased cell proliferation, induced cell cycle arrest at the G0/G1 phase, promoted apoptosis and hindered the capability of the cells to migrate and invade. Phospho-specific antibody arrays demonstrated overall downregulation of the PI3K/AKT and EGFR signaling mechanisms following AG-205 and siRNA treatment. Furthermore, subcellular fractionation demonstrated subcellular localization changes of EGFR. Alteration in the expression of key markers of cell proliferation, apoptosis and cell cycle control revealed PGRMC1 inhibition decreases breast cancer proliferation.

Conclusion: Our data demonstrate that PGRMC1 plays a prominent role in regulating breast cancer growth and progression by altering the PI3K/AKT and EGFR signaling mechanisms.

School: Graduate School of Biomedical Sciences | Campus: El Paso

GS3+ PIRAYESH, ELHAM

In-vivo and in-vitro studies to identify the interaction site of the intracellular domain of serotonin type 3A receptor (5-HT_{3A}) and chaperon protein RIC-3.

Elham Pirayesh, Antonia G. Stuebler, Michaela Jansen

The serotonin type 3A (5-HT_{3A}) receptor is a homopentameric cation-selective member of the pentameric ligand-gated ion channel (pLGIC) superfamily. Members of this superfamily assemble from subunits, each of which consists of three domains, extracellular (ECD), transmembrane (TMD), and intracellular domain (ICD). Previously, we have shown that 5-HT_{3A}-ICD fused to maltose binding protein (MBP) directly interacts with the chaperone protein resistance to inhibitors of choline esterase (RIC-3) without the involvement of other protein(s). Additionally, we have also demonstrated that 5-HT_{3A}-ICD is required for the interaction between 5-HT_{3A} and RIC-3. To elucidate the molecular determinants of this interaction we developed different MBP-fused 5-HT_{3A}-ICD constructs by deletion of large portions of its amino acid sequence. We have expressed seven mutants in *Escherichia coli* and purified them to homogeneity. Using RIC-3 pull down, the interaction of MBP-5HT_{3A}-ICD constructs and RIC-3 is investigated. Furthermore, we co-expressed 5-HT_{3A} and RIC-3 in *Xenopus* oocytes to study the interaction in-vivo by two electrode voltage clamp (TEVC) recordings. Full-length 5-HT_{3A}-mediated currents are significantly reduced when RIC-3 is co-expressed. Here, we study if individual MBP-5-HT_{3A}-ICD constructs compete with 5-HT_{3A} receptor for interaction with RIC-3. Our results support the hypothesis that interaction of the 5-HT_{3A}-ICD and RIC-3 is mediated by specific regions of the 5-HT_{3A}-ICD as opposed to the complete domain. Further studies are directed toward identifying the exact interaction site of the 5-HT_{3A}-ICD and RIC-3.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ REDMAN, WHITNI

Toxicity and Limitations of Glycoside Hydrolases in Dispersing Poly-Microbial Biofilms

Whitni K. Redman, Derek Fleming, Kendra P. Rumbaugh

85% of all bacterial infections are bio-associated impacting 2% of the United States population at some point in their life. Biofilms are communities of microorganisms with a self-synthesized extracellular polymeric substance (EPS). EPS not only makes it difficult for immune cells to enter the biofilm, but also creates a challenge for antimicrobial agents to reach the infection. Previous studies have shown glycoside hydrolases (GHs) are effective in breaking the glycosidic linkages found within the EPS, dispersing bacterial cells, and allowing antimicrobial agents in contact with the microbes. This study focuses on determining the efficacy of GHs as well as comparing the efficacy of GHs in biofilm dispersal. Various concentrations of GHs were used to treat normal colonic epithelial (CoN) cell line CCD841. Cell toxicity was determined by completing a colorimetric assay using AlamarBlue. At a maximum concentration of 20%, 2x concentration used in vivo, 2x10⁴ cells were seeded 48 hrs before one 90-minute treatment. Amylase and cellulase exhibited cell toxicity at 10% or higher and 5% or higher concentrations, respectively. 48-hour ex vivo biofilms were treated with 500 units/gram of various GHs for 4 hours to compare efficacy in biofilm dispersal. The efficacy of dispersing ex vivo *Pseudomonas aeruginosa* and *Staphylococcus aureus* biofilms varied greatly depending on the GH. Ex vivo clinical samples were treated with amylase or cellulase to determine targeted species as well as restrictions for each GH. Cellulase was effective in dispersing *Klebsiella oxytoca* while it did not effectively disperse bacteria from the phyla Firmicutes and Bacteroidetes. Amylase was effective against *Corynebacterium striatum* but was effective in dispersing Proteobacteria phyla. In conclusion, GHs may show potential toxicity in vitro and each GH has their own limitations efficacy depending upon which bacteria are present in the infection.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ SIKDER, MOHD OMAR FARUK

Amino acid transporter SLC6A14: a novel drug target for colorectal cancer

Mohd Omar Faruk Sikder, Sathish Sivaprakasam, Vadivel Ganapathy

SLC6A14 is a Na/Cl-coupled transporter for 18 of the 20 amino acids. This transporter shows upregulation in colorectal cancer (CRC). However, the relevance of this upregulation to disease progression is not known. We postulated that deletion of SLC6A14 or pharmacological blockade of its function would suppress CRC by depleting amino acids and suppressing mTOR signaling selectively in tumor cells. To test this postulate, we compared the development and progression of CRC in two different experimental models between wild type mice and Slc6a14-null mice. In both models (Apc^{min/+} and DSS/AOM), deletion of Slc6a14 provided significant protection against colon cancer. To evaluate the impact of pharmacologic blockade of Slc6a14

GS3+ SUTEBLER, ANTONIA

A Comparison Between Homomeric and Heteromeric 5-HT3 Receptors in Response to the Antidepressant Bupropion

Antonia G. Stuebler, Michaela Jansen

The FDA-approved drug bupropion has been prescribed as an antidepressant (Wellbutrin) for over three decades, and more recently as a smoking cessation aid (Zyban). The presumed mechanism of action of bupropion was inhibition of norepinephrine and dopamine reuptake by their respective transporters. Recently, bupropion's non-competitive antagonistic effect was demonstrated at nicotinic acetylcholine receptors (α1, α2, Torpedo, α1, α2, α3, α4, α5, α6, α7) of the Cys-loop superfamily providing an alternate pharmacological pathway. Our laboratory has shown that another cation-selective member of the Cys-loop superfamily, the serotonin type 3 receptor (5-HT3-R), is modulated by bupropion at clinically relevant concentrations. Specifically, we determined that bupropion acts as a non-competitive antagonist at 5-HT3A subunits. 5-HT3-Rs are found pre- and postsynaptically, and are currently targeted by anti-emetics and irritable bowel syndrome treatments. They hold promise as potential future targets for multiple neurological disorders, such as Alzheimer's disease, schizophrenia, and bipolar disorder. The 5-HT3-R family consists of five different subunits (A-E) but the assembly of this receptor requires the 3A subunit yielding either a homomer or heteromer with another subunit. To date, only the interaction of bupropion with the 3A subunit has been studied. Here, we extend our investigations to heteromeric 5-HT3AB-Rs, which are found in the central and peripheral nervous system, predominantly in the amygdala, caudate nucleus, and hippocampus. The functional interaction of bupropion with 5-HT3AB-Rs was characterized in *Xenopus* oocytes using two-electrode voltage clamp and patch clamp techniques. Docking studies and directed mutagenesis were used to identify the binding site/s in 5-HT3-R. Our studies demonstrated that bupropion, similar to other non-competitive antagonists, evokes different responses in 5-HT3AB-Rs as compared to the homomeric 5-HT3A-Rs.

PHARMACEUTICAL SCIENCES | SCHOOL OF PHA

PHAR AKWII, GRACE RACHEAL

Small GTPase RhoA participates in Angiopoietin 2-induced lymphatic endothelial cell migration

Akwii R.G., Zahra F.T., Sajib M.S., Gibson, K., Tullar P., Mikelis C.M

Angiopoietin 2 (Ang2) is part of the Angiopoietin/Tie signaling pathway, involved in angiogenesis among other vascular functions. It is a ligand for the Tie2 receptor where it can act as an agonist or antagonist. The role of Ang2 has been referred as

PHAR BAGCHI, SOUNAK

Combinatorial Multifunctional Therapy for the Treatment of NeuroHIV

Sounak Bagchi*,Rahul Dev Jayant (Ph.D.)

The emergence of highly active antiretroviral therapy (HAART) significantly has helped in reducing the prevalence and bettering the quality of life of HIV-infected individuals. The antiretroviral therapy (ART) mainly target active HIV-1 infection but fails

PHAR CHOWDHURY, EKRAM AHMED

Blood-brain barrier permeability of [13C]sucrose in young adult and aged mice

Ekram Ahmed Chowdhury, Faleh Alqahtani, Behnam Noorani, Md Sanallah Sajib, Constantinos M Mikelis, Reza Mehvar, Ulrich Bickel

Background: Aberrant expression of the RON receptor tyrosine kinase is a pathogenic feature and a validated drug target in various types of cancers. Currently, therapeutic antibodies targeting RON for cancer therapy are under intensive evaluation. Here we report the development and validation of a novel humanized anti-RON antibody-drug conjugate for cancer therapy.

Methods: Antibody humanization was achieved by grafting sequences of complementarity-determining regions from mouse monoclonal antibody Zt/g4 into human IgG1/Chc receptor frameworks. Humanized Zt/g4 subclone H1L3 was conjugated with mono-

PHAR HADI ESFAHANI, SHIVA

Is diminazene an activator of ACE2?

Shiva Hadi Esfahani, Srinidhi Jayaraman, Vardan T Karamyan

The aim of this study was to verify a recently reported effect of diminazene (DMZ) on activity of angiotensin-converting enzyme

PHAR LAHOOTI, BEHNAZ

High Throughput Technique for Developing Non-viral Nanoparticles for gene delivery

Behnaz Lahooti and Rahul Dev Jayant (Ph.D.)

During ischemic stroke, oxygen and nutrient deficiency initiate secondary injury cascades, including intracellular sodium and ex-

PHAR NOZOHOURI, SAEIDEH

Effect of neurolysin on cellular edema during ischemic stroke

Saeideh Nozohouri, Srinidhi Jayaraman, Bhuvaneshwar Vaidya, Vardan Karamyan, Thomas Abbruscato

During ischemic stroke, oxygen and nutrient deficiency initiate secondary injury cascades, including intracellular sodium and excitotoxicity. All of these pathophysiologic processes contribute to cellular and vasogenic edema, which can be a primary reason

PHAR RAMACHANDRAN, SHARAVAN

Re-positioning of novel anti-psychotic drug for pancreatic cancer treatment



PHAR SIFAT, ALI

Maternal Electronic Cigarette Use Can Enhance Offspring Susceptibility to Hypoxic-Ischemic Brain Injury

Ali Sifat Saeideh Nozohouri Heidi Villalba Bhuvaneshwar Vaidya Thomas Abbruscato

Prenatal exposure to tobacco smoke and nicotine is believed to interfere with fetal brain development predisposing offspring to different neurobehavioral and neuropsychological disorders. Included in this is increased neonatal vulnerability to hypoxic-ischemic encephalopathy (HIE) which is a major cause of neonatal death and child disability in the US. These effects could be in part, attributed by fetal nicotine exposure. Use of electronic cigarettes (e-Cigs), commonly known as vaping, has rapidly increased in recent times in the general population. E-Cig use during pregnancy is also increasing because of the addictive properties of nicotine with the perceived safety of e-Cig use. In this study, we investigated the effects of maternal e-Cig use on neonatal brain development and HIE utilizing a combination of in vitro and in vivo models. Pregnant CD1 mice were exposed to e-Cig vapor (2.4% nicotine equivalent to human exposures). Primary cortical neurons were isolated and cultured from e-Cig exposed fetus with subsequent exposure to oxygen-glucose deprivation followed by reoxygenation (OGD/R). HI brain injury was induced in 8-9 days old mouse pups by a combination of left common carotid artery ligation and 15 minutes exposure to 8% oxygen. We found that e-Cig exposed neurons demonstrated decreased cell viability and increased PARP1 expression in OGD/R condition. These effects were accompanied by decreased glucose uptake & glucose transporter expression and mitochondrial dysfunctions. Our preliminary data also indicate increased sensitivity to HI brain injury in prenatally e-Cig exposed mouse pups. Additionally, in utero e-Cig exposed offspring displayed hyperactivity at postnatal day 45 in the open field test. These results indicate that maternal e-Cig exposure could lead to offspring behavioral abnormalities and enhance HI brain injury. This study is instrumental in elucidating the possible deleterious effects of maternal e-Cig use in the general population.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR SIVANDZADE, FARZANE

Assessing the Protective Effect of Rosiglitazone against Tobacco Smoke and Electronic Cigarette Induced Oxidative Stress Damage at the Blood Brain Barrier

Farzane Sivandzade Luca Cucullo

The content of tobacco smoking (TS) and also e-cigarettes (EC) are associated with vascular endothelial dysfunction in a causative and dose-dependent manner primarily related to the content of reactive oxygen species (ROS), nicotine, oxidative stress, smoking-induced inflammation. It is well established that both TS and EC promote glucose intolerance and increases the risk of developing type-2 diabetes mellitus (2DM) with which it shares other pathogenic traits including the high risk of neurological cerebrovascular disorders via ROS generation, blood-brain barrier (BBB) impairment and in

PHAR SUTHE, SREEDHAR REDDY

Therapeutic Eradication of pancreatic Cancer by a Novel Antibody-Drug Conjugate Targeting RON Receptor Tyrosine Kinase, a Prognostic Bio marker for Shortened Patient Survival

Sreedhar Reddy Suthé, Hang-Ping Yao and Ming-Hai Wang

Background: Aberrant expression of the RON receptor tyrosine kinase is a pathogenic feature and a validated drug target in various types of cancers. Currently, therapeutic antibodies targeting RON for cancer therapy are under intensive evaluation where we are developing and validation of a novel humanized anti-RON antibody-drug conjugate for cancer therapy.

Methods: Antibody humanization was achieved by grafting sequences of complementarity-determining regions from mouse monoclonal antibody Zt/g4 into human IgG1/G5 receptor frameworks. Humanized Zt/g4 subclone H1L3 was conjugated with monomethyl auristatin E using a dipeptide linker to form H-Zt/g4-MMAE. Pharmacokinetic analysis of H-Zt/g4-MMAE was determined using ELISA and LCMS. Therapeutic efficacies of H-Zt/g4-MMAE were validated in vivo using three pancreatic cancer xenograft models. Toxicological activities of H-Zt/g4-MMAE were determined in mouse and cynomolgus monkey.

Results: H-Zt/g4-MMAE had a drug to antibody ratio of 3.77:1 and was highly stable in human plasma with a dissociation rate less than 5% within a 20 day period. H-Zt/g4-MMAE displayed a favorable pharmacokinetic profile in both mouse and cynomolgus monkey. In vivo, H-Zt/g4-MMAE inhibited pancreatic cancer xenograft growth with tumoristatic concentrations at 1~3 mg/kg bodyweight. Significantly, H-Zt/g4-MMAE eradicated tumors across multiple xenograft models. Moreover, H-Zt/g4-MMAE inhibited and eradicated xenografts mediated by pancreatic cancer stem-like cells and by primary cells from patient-derived tumors. Toxicologically, H-Zt/g4-MMAE is well tolerated in mice up to 60 mg/kg. In cynomolgus monkey, H-Zt/g4-MMAE up to 30 mg/kg had a manageable and reversible toxicity profile.

Conclusions: H-Zt/g4-MMAE is superior in eradication of pancreatic cancer xenografts with favorable pharmacokinetic profile and manageable toxicological activities. These findings warrant the transition of H-Zt/g4-MMAE into clinical trials in the future.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

MS1-2 AL DOGOM, SARA

Complications of Thyroid Surgery Retrospective Review of Cases Performed at Texas Tech University Medical Center

Student: Sara Al Dogom | First Author: Sara Al Dogom | Principle Investigator: Dr. Joehassin Cordero | Additional Investigator: Dr. Tam Nguyen

Thyroid surgery is performed in the U.S. on the daily basis. This type of surgery is affected by a variety of complications. The aim of our study is to analyze retrospectively the type and incidence of postoperative complications of thyroid surgery experienced

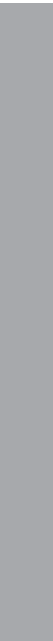
MS1-2 ALDRETE, JONATHAN

Subgaleal Osteolytic Pigmented Epithelioid Melanocytoma with Dural Infiltration

Pigmented Epithelioid Melanocytoma (PEM) is a recently described rare, dermatological tumor that shares common histological features with the epithelioid blue nevus and animal-type melanoma. Preliminary findings have shown the PEM to be prevalent with- in adolescents and young adults, mean age 28 years, with no predilection towards ethnicity or sex, and various locations through distal extremities. PEMs are also not correlated with sun exposure and display an indolent clinical presentation. Additionally, PEM has been associated with a familial syndrome, Carney Complex, that encompasses many tumors including melanomas and schwannomas. Yet, the true nature of this tumor is not fully understood, and current clinical regimens involves careful observa- due to unknown prognosis. A few case studies have given slight indication that PEM may be benign, because it rarely spreads pas- regional lymph nodes. Currently, this entity is classified as a low-grade tumor with metastatic potential.

This case encompasses a unique presentation of PEM that is not described in the literature. A 14-month old female presented to clinic by her mother who noticed two holes in the back of the child's head. Neuroimaging revealed a subgaleal lesion and an open biopsy was conducted. Following biopsy, a diagnosis of PEM was established, and further investigation revealed the PEM to be a lytic lesion of the posterior parietal calvarium. Intraoperative findings uncovered further infiltration into the dura. Partial resection of the tumor ensued, with most of the tumor removed. Intraoperative decision to leave a portion of the PEM that adhered to the was made to spare the dura from incision. Due to the ambiguity of PEM prognosis, meticulous observation of the patient is being conducted. This case is unique as the PEM has shown a subgaleal location and presented as a lytic lesion of the skull and dura has not been described by the literature to date.

School: School of Medicine | Campus: Lubbock



MS1-2 BIHARI, SANYUKTA

Sm-p80-specific antibodies play significant role in protection against *Schistosoma mansoni* challenge infection in mice

Sanyukta Bihari, Adebayo J. Molehin, Afzal A. Siddiqui

Schistosomiasis, a disease caused by parasitic helminths belonging to the genus *Schistosoma*, currently affects over 240 million people worldwide with the majority being school-aged children. The effect of schistosomiasis control programs predicated on m

MS1-2 BOYLAN, KATHRYN

Knowledge and Attitudes of Medical students about the HPV Vaccine

MS1-2 BURDEN, RYAN

Using a Retrospective Approach to Maximize Integration of Healthcare Measures and Compliance Standards within the TCUH Correctional Managed Health Care Program

Ryan Burden

OBJECTIVES This project sought to create and implement a more effective data integration network by retroactively evaluating data metrics currently in use within the TCUHSC Managed Health Care program.

BACKGROUND TCUHSC Correctional Managed Health Care program is responsible for the health care of a significant portion of the offender population throughout the West Texas sector. Effective communication and accurate reporting of health information is of critical importance and can directly affect the overall outcome of patient health management. Negative factors such as

MS1-2 CASTANEDA, KAREN

Breast-Conserving Surgery in Male Breast Cancer Becoming More Frequent in the United States

Yana Puckett, MD, MBA, MPH, MS; Karen Castaneda; Theophilus Pham; Catherine A. Ronaghan, FACS

Background: Male breast cancer (MBC) is a rare disease, comprising only 1% of all incidents of breast cancer diagnosed in the United States. Most of the treatment strategies for male breast cancer are based on the studies of female breast cancer and modified radical mastectomy (MRM) remains the standard of care for virtually all the MBC cases. Breast-conserving surgery (BCS) in MBC has been coming to the forefront as a reasonable treatment option. We elected to compare surgical outcomes between BCS and MRM in male breast cancer.

Methodology: National Surgical Quality Improvement Program (NSQIP) database was analyzed for the year 2015. We reviewed all male breast surgical patients. Mastectomy for gynecomastia, simple mastectomy, and radical mastectomy was excluded from analysis. Partial mastectomy (with and without) axillary lymph node biopsy were compared to MRM. Chi-square and independent t-tests were used to compare the two variables for demographics, comorbidities, postoperative complications.

Results: A total of 175 patients underwent breast surgery for MBC in 2015. BCS was performed on 101 males (57.7%) and MRM was performed on 74 (42.29%). Patients that underwent MRM were older than the patients that underwent BCS (57 versus 66 years, respectively) ($P < 0.0001$). Comorbidities were overall similar in both groups. Postoperative complications were overall no

MS1-2 DHIR, NIKITA

Medical versus Surgical Therapies for Pump Thrombosis: Mortality Assessed by Meta-Analysis

Nikita Dhir, Dr. Nandini Nair

Purpose: Thrombus formation is the most feared complication that impact clinical outcome in ventricular assist device patients. This study is a meta-analysis which compares mortality in medical versus surgical therapies for pump thrombosis.

Methods: Records were identified using PRISMA guidelines for literature search (PubMed, Google Scholar). Subjects >age18 supported on a continuous flow device who experienced a pump thrombosis event at least once were included. Subjects <18 and supported on pulsatile pumps were excluded. Risk of bias was assessed using the Newcastle -Ottawa <2eEeSubtilesthal thaly

MS1-2 DIAZ, RONY

The use of an online interactive module to review topics of diabetes for the United States Medical Licensing Examination (USMLE) Step 1

Rony Diaz, Jannette Dufour, Ph.D., Lillian Ene

Diabetes is becoming a common health issue in the United States. Due to its familiarity in clinical medicine, topics about this disease are commonly covered in first-year medical courses and are tested in the United States Medical Licensing Examination (USMLE) Step 1, which is taken during the second year of medical school. Medical students cover the basic concepts about this disease about a year before they take their USMLE exam and risk the possibility of forgetting key general principles. At the Texas Tech University Health Sciences Center (TTUHSC), interactive online modules have been effective resources for students to get a more detailed understanding of various topics in medicine. Based on these observations, we hypothesize that by providing these as review modules they will help medical students understand the topics associated with diabetes for their success in the test material board exams, and to provide a better understanding of this disease in clinical medicine. The module will utilize PowerPoint 2013 and the interactive e-learning tools of Adobe Captivate 8. The online interactive module will provide a single source with high information on the medical topics of the pancreas and diabetes that include, but are not limited to the basic anatomy, physiology, and pathology of the disease. The review module can be completed at the student's own pace, with the option to navigate through the different sections to guarantee full comprehension of the material. The effectiveness of the project will be measured through short assessments that medical students will take before and after completion of different sections in the module. The module will also include clinical vignette-style practice questions that will assimilate questions on the USMLE to provoke critical thinking content covered. The goal is to have this module available to medical students during year 1 and the next academic year to use their preparation for their board exam.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 DOMINGO-JOHNSON, E.L.

Peripheral Nerve repair with Nerve Allograft versus Synthetic Conduits and Nerve Autografts.

E.L. Domingo-Johnson, Desirae Mckee MD

Introduction: There are three main methods used to repair injured nerves. Autografts are harvested directly from another location on the patient. The tissue is patient specific comprised of nerve cells, and readily accessible. However, the patient would be losing nervous tissue from the donor site and will also need to heal the area. Nerve conduits are made of synthetic materials and used to promote healthy nerve regeneration. There are limitations to the type and size of injuries that nerve conduits can be used for. Nerve allografts provide a readily available option. It is composed of decellularized and cleansed extracellular matrix recovered from human donor peripheral nerve tissue. It provides the tissue components of an autograft with the availability of nerve conduits. In addition, the patient is spared from having to act as a self-donor.

Methods: In this retrospective and prospective cohort series, we followed patients who underwent peripheral nerve repair by two fellowship trained surgeons at our institution. Comparisons were made between the groups with respect to demographic data, comorbidities, complication and reoperation rates, length of injury and follow up outcomes.

Keywords: Nerve Allograft, Nerve Conduit, Nerve Autograft, Nerve repair

School: School of Medicine | Campus: Lubbock

MS1-2 D'SOUZA, PRESTON

Assessing the Activity of CRF Neurons in the Central Amygdala Following Application of Kappa Opioid Receptor Agonist: A Novel Network in Pain Relief

Preston D'Souza, Takaki Kiritoshi, Vadim Yakhnitsa, Volker Neugebauer

Chronic pain is a major health care issue with limited treatment options outside of prescribing opioids. Our previous work on pain mechanisms has identified the amygdala, a limbic brain region known for its role in emotions and memory, as a key player in emotional-affective aspects of pain and pain modulation. Specifically, the main output region of the amygdala (central nucleus, CeA) has been linked to the processing of nociceptive information and to pain behaviors through numerous interneuron networks including cells like corticotropin-releasing factor (CRF) neurons. Recent evidence suggests that activation of kappa-opioid receptors (KOR), Gi coupled metabotropic receptors, has opposing effects to mu-opioid receptor agonists, such as morphine, on CeA output. The KOR antagonist could potentially mitigate pain. This study tested the effects of a KOR agonist (U-69,593) on CeA output neurons specifically CRF cells, using in-vitro calcium imaging.

A genetically encoded calcium indicator (GCaMP6f) was injected stereotaxically into the right CeA of transgenic CRF-Cre rats. After 4-6-weeks to allow sufficient time for expression, brain slices containing the amygdala were obtained and CRF cells were visualized with multiphoton microscopy. Trains of electrical stimuli (5Hz) were delivered to the dorsomedial hypothalamus providing nociceptive input from the parabrachial nucleus (PB) to the CeA. Calcium signals were measured in CRF neurons continuously before, during and after agonist perfusion. We found that CRF neurons displayed synaptically-evoked activity following PB stimulation. Synaptically evoked activity increased during agonist perfusion.

These findings support the novel concept that KOR in the amygdala contribute to pain perception and open an avenue for KOR antagonists as novel pharmaceuticals to mitigate pain.

School: School of Medicine | Campus: Lubbock

MS1-2 EDWARDS, SAMANTHA

Internal Medicine Weight Based Demographics

Dr. Drew Payne, Dr. Marcella Rivas, Samantha Edwards, Sharan Bijlani, Hannah Fairley, Nathan Lloyd

Obesity is a contributing factor to many disease processes and continues to rise nationwide. The aim of this study was to estimate the frequency and prevalence of obesity and its association with congestive heart failure, diabetes mellitus, obstructive sleep apnea, hypertension, and myocardial infarction in West Texas adults. Data were extracted from Texas Tech HSC internal medicine clinic from January 1st, 2016 through March 31st, 2018 (n= 9,528). Average levels of income based on zip code were also extrapolated. We found statistically significant differences (p<0.001) in all variables except MI (p=0.055) and ethnicity (p=0.054). We observed lower prevalence in our sample of any degree of obesity in males compared to females (43.8% vs. 48.6%), and particularly the highest degree of obesity (20.1% vs. 27.4%). Male gender was slightly associated with lower weight, OR=0.92 (95% CI: 0.85, 1.00). Similarly, younger age (OR=0.96, 95% CI: 0.94, 0.98) and higher income level of residency area (OR=0.96, 95% CI: 0.94, 0.98) were found to have unadjusted very small protective effect on heavier weight status. Among health status predictors, we found that OSA (OR=4.56, 95% CI: 4.02, 5.17) was largely associated to heavier weight status. Diabetes (OR=2.0, 95% CI: 1.86, 2.17), HTN (OR=1.88, 95% CI: 1.73, 2.03), and HLD (OR=1.56, 95% CI: 1.44, 1.68) also showed a small effect-size association with heavier weight status. The effect size of CAD (OR=1.11, 95% CI: 1.01, 1.22) was small, and MI did not show any association with weight status. The frequency and prevalence of obesity continues to increase in West Texas and comorbidities with significant morbidity and mortality are linked to obesity. Income is a protective characteristic and likely allows access to more effective preventive interventions. Access to these preventive interventions are needed to slow the rising prevalence of obesity and its comorbidities.

School: School of Medicine | Campus: Lubbock

MS1-2 ESLINGER, CODY

Alternate telomere lengthening (ALT) cancers are a cross-disease discrete molecular phenotype with high intrinsic resistance to DNA damaging agents that may be reversible by ATM kinase inhibitors.

Cody Eslinger, Balakrishna Koneru, Shawn Macha, Austin Turner, Mikal Ramon

In order to maintain proliferation, cells require the ends of chromosomal DNA to be lengthened to avoid degradation. Stem cells as well as many cancers use an enzyme known as telomerase to ensure single growth. However, some cancers use a non-telomerase mediated telomere lengthening mechanism known as ALT. The mechanism behind ALT activation in cancer cells is not well understood, although it is thought to be homologous recombination mediated. In normal cells and cancer cells that maintain telomeres, DNA damage induces ATR or ATM kinases to repair single or double stranded breaks, respectively. Previous studies have indicated that ALT+ cells, which dysfunctional telomeres which are detected by the cells as intrinsic DNA damage which drives the ALT phenotype by activation of DNA repair pathways. Using a novel marker for ALT (C-circles) our lab has recently identified ALT patient-derived cell lines and xenografts from a variety of cancer types, including neuroblastoma, osteosarcoma, rhabdomyosarcoma, lymphoma, and leiomyosarcoma. Using these preclinical models, we have shown that cell lines from ALT cancers manifest resistance to single agent ATR/ATM inhibition as well as to standard chemotherapy. However, small molecule ATM kinase inhibitors reverse resistance to DNA-damaging chemotherapy in ALT+ cancer cell lines. We have shown that the C-circle assay can specifically detect ALT cancers in patient tumor samples. Thus, ALT cancers are a discrete molecular phenotype of cancer that spans many traditional histological cancer types and may be especially susceptible to use of ATM kinase inhibitor drug and radiation resistance that is a hallmark of ALT+ cancers.

School: School of Medicine | Campus: Lubbock

MS1-2 ESPINOSA-TELLO, ALEJANDRO

STAT3: protein-protein interactions on ribosome

Alejandro Espinosa-Tello, Alexander Ha, Elena Tikhonova, Andrey Karamyshev

Cancer is the second leading cause of death in the US. Development of new approaches for cancer treatments is a high priority. It has been found that cancer is linked to expression of the STAT3 gene (Signal Transducer and Activator of Transcription 3). Abnormal upregulation of STAT3 is associated with uncontrolled cell growth, cancer progression and linked to 70% of tumors. It was demonstrated that STAT3 knockdown reduced abnormal cell growth, decreased tumor progression in mice and induced apoptosis of cancer cells thus making STAT3 a potential target. However, recent studies had shown that direct inhibitors of STAT3 activity did not work for cancer treatment. New strategies addressing biogenesis of STAT3 are needed.

In this project we are studying the early events of STAT3 translation and protein-protein interactions on ribosomes. Our work focuses on detection of cotranslational STAT3 interactions, identification of its interacting partners and verification of role of these interactions. To study protein interactions, we developed a system for in vitro translation of STAT3 protein. We used different sources of ribosome and found that the Rabbit Reticulocyte Lysate system provided the best expression. Next, photocrosslinking was used to visualize protein-protein interactions. Specific mutations were introduced into STAT3 to direct incorporation of a Lysine tRNA with a covalently attached photocrosslinking probe. At different stages of translation newly synthesized STAT3 can interact with different binding partners therefore we introduced amber mutations at different positions. Our results showed this approach allowed detection of STAT3 interactions on ribosome. Furthermore, we observed various protein complexes at different stages of STAT3 translation, suggesting that multiple proteins are interacting with STAT3 during synthesis. The future direction will include identification of these protein partners and elucidating their role as po

School: School of Medicine | Campus: Lubbock

MS1-2 FROST, JOSHUA

Possible Clinical Implications of Peripheral Zone Changes Depending on Prostate Size

Joshua Frost, Werner de Riese, Lisa Smith

Numerous studies have observed an inverse relationship between the extent of Benign Prostate Hypertrophy (BPH) and the incidence of prostate cancer (PCa). Despite this relationship being well documented within the literature, only few studies have explored specific mechanisms by which BPH and PCa may affect one another. One possibility has been brought up that growth in the transition zone due to BPH may cause pressure induced changes in the peripheral zone leading to atrophy and causing

MS1-2 GEORGE, ASHER

The Public Health Impact of Stigma on the Current Opioid Crisis

Asher K. George & Jeff Dennis, PhD

Background: Opioid use in the United States has increased substantially in recent decades due to a combination of the availability of both prescription opioid pain medication and black tar heroin. It is widely recognized that these two sources, broadly defined, have had an enormous impact on the growth of the current opioid epidemic. A distinguishing feature of this epidemic from most substance use disorders is that many cases of opioid dependence originate with a doctor's prescription. Therefore, a greater understanding of the stigma surrounding addiction from iatrogenic origins is needed. In the case of opioids, misrepresentations of research findings have also played a substantial role in their proliferation. Relating to the stigma of addiction, some clinical professionals and organizations have advocated for an adjustment of the language used to discuss addiction and treatment. To play a meaningful role in addressing the opioid epidemic, public health must promote an accurate representation of the research and also use the most up-to-date terminologies surrounding addiction.

Aims: This study considers the theoretical underpinnings of stigma relating to opioids and follows with an exploration of how opioid use is described in public health discourse.

Data & Methods: We analyzed five years of articles from the American Journal of Public Health (AJPH), a top-tier journal in public health. We identify the number of articles using terms such as "opioid use" and "opioid abuse" to assess how well research terminologies have kept up with public health discourse on the opioid epidemic.

Results: Preliminary results suggest that the AJPH follows terminology standards for the term "substance use disorder" in most cases, although the term "substance abuse" remains prevalent in recent years. Public health research and practice should work to maintain currency with terminologies associated with clinical best practices in the study of addiction and treatment.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 GOTTAM, BHARGAVESH

Mysterious identity: The CD206+ population in surviving allogeneic Sertoli cell grafts is neither macrophages nor dendritic cell

Bhargavesh Gottam, Kandis Wright and Jannette Dufour

Sertoli cells (SCs) are immune privileged cells in the testis that protect germ cells. Interestingly, SCs survive long-term post-allo-transplantation (transplantation between the same species) without immunosuppressive therapy. However, current human transplantation recipients require life-long immune suppressive therapy to prevent tissue rejection with varying success. Therefore, by understanding the mechanisms by which SCs evade immune rejection, methods to improve human transplantation survival requiring little to no immunosuppressive drugs can be developed. Either primary SCs (pSCs) or mouse SC line (MSC-1) cells were transplanted underneath the kidney capsules of mice. The grafts were collected between days 1-20 post-allo-transplantation and the immune cells present in the grafts were characterized. The grafts predominantly contained macrophages, which can be M1 (pro-inflammatory) or M2 (CD206+, F4/80+; anti-inflammatory). M2 macrophages were present throughout the surviving pSC compared to rejected MSC-1 cell control grafts. Interestingly, there were CD206+ cells in both grafts that were not macrophages. Since dendritic cells (DCs) express CD206 and are in the grafts, we further tried to identify if the CD206+ cells were DCs by immunohistochemistry. DCs (CD11c+) were seen in the middle of the pSC grafts at day 14 (D14) post-allo-transplantation and at D14 and D20 in the MSC-1 grafts. CD206+ cells appeared near the edges of the grafts. Although there were CD11c+ CD206+ cells at D14 and D20 in both grafts, the majority of the CD206+ cells were not DCs. These data suggest that the role of macrophages, DCs and other immune cells in the grafts is complex and requires further study. Future studies will identify CD206+ cells and characterize the DCs as mature, immature, or regulatory. Overall, if the mechanisms mediating SC survival post-allo-transplantation become clearer, transplantation survival can be much improved without the use of immunosuppressive drugs.

School: School of Medicine | Campus: Lubbock

MS1-2 GUERRERO, ANDRES

Auditory Cues as Reminders to Head Scan at Intersections: A Pilot Study

Andres E. Guerrero-Criado^{1,2,3}, Jing Xu^{1,3}, Michael Wong^{1,4}, Alex Bowers^{1,3}

¹ Schepens Eye Research Institute, ² Texas Tech University Health Sciences Center School of Medicine, ³ Harvard Medical School, ⁴ University of California, Berkeley School of Optometry

Introduction: Driving is essential to patient autonomy. Recently, there has been an increase in the number of studies evaluating effects of HH (Homonymous Hemianopia), on driving performance. In this study we investigate the ability of individuals to complete a full head scan during a driving simulation, differentiating between scenarios in which these participants were in their field of vision or were simulated to have an HH.

Methods: We ran thirty-two (n=32) trials with individuals in whom we simulated HH. In each trial an auditory cue was randomized to come from either the left or right of the individual to instruct them to complete a full head scan once they reached the intersection. This was done to determine the parameters of a safe and functional auditory cue. Individuals' pupil and head movements were tracked during simulations to accurately record head scan times. Each individual was subjected to four trials driving with: a normal field of vision in no-traffic conditions, a normal field of vision in traffic conditions, with simulated HH in no-traffic conditions, and with simulated HH in traffic conditions. Two sets of these trials were run with the cue given at 50m and 30m from the intersection.

Results: Reaction time across conditions was about 0.70s. The reaction time of individuals in no-traffic conditions regardless of field of vision was 0.71s, and those in traffic conditions were 0.69s. Reaction times were significantly faster in traffic conditions (p < 0.001).

Conclusion: Auditory cues are effective in reminding individuals to scan their field of vision in traffic conditions.

MS1-2 HANSON, KEITH

Child Abuse and Deformational Plagiocephaly in a West Texas Hospital System

Keith Hanson, Preston D'Souza, Pranati Pillutla, Peyton Presto, Brandon McCarty, and Laszlo Nagy, MD

Intro: The aim of this study was to assess deformational plagiocephaly's (DP) predictive value in neglect and physical child abuse (NCA) within the pediatric population. In addition, we sought to characterize the prevalence of DP and NAT for our hospital's primary catchment area.

Methods: Data on hospitalized patients diagnosed with NAT and/or neglect between 2012-2018 was collected via retrospective chart review. All enrolled children were under the age of 4 years old at the time of diagnosis, and those without legible head MRIs during their initial hospitalization were excluded. Utilizing neuroimaging, we calculated the Cranial Vault Asymmetry Index (CVAI) and Cranial Index (CI) for each patient to assess for DP. Differences between the two groups were assessed using Wilcoxon rank sum test for continuous variables and Fisher's exact test for categorical variables. A p-value of 0.05 or less was considered statistically significant. All analyses were conducted using SAS 9.4 (Cary, NC, USA).

Results: The prevalence of DP within the combined cohort of NAT and Neglect patients is 21%, similar to that reported in the literature for the general population (20-50%). There was no difference between the prevalence of DP and a history of NAT (p>0.1) or Neglect (p>0.1). Furthermore, there was no correlation between CVAI index and characteristics of initial presentation or history of trauma for either NAT (p-value: 0.359 and 0.250 respectively) or Neglect groups (p-value: 0.116 and 0.770 respectively).

Conclusion: While there are many limitations to this study, our results suggest that abused children are no more likely to have a history of DP than the general population, and the degree of DP is not associated with severity of trauma history or initial presentation. We hope the results of this study promote future investigations for unique and subtle predictive factors of child abuse/neglect.

School: School of Medicine | Campus: Lubbock

MS1-2 HOPE, BRIANNA

Risk factors and associations with surgical site infections after cesarean sections at a local facility

MS1-2 HUSSAIN, SHABAB

Benefits of Cardiovascular Learning Modules for Major Organ Systems .6les 0 TB

MS1-2 KHAN, AISHA

Takayasu Arteritis Presenting as Atypical Kawasaki Disease

MS1-2 KUBOSUMI, AARON

Mitochondrial MicroRNAs in Aging and Alzheimer's

Kubosumi, A. Reddy, PH.

Mitochondrial dysfunction is a hallmark of Alzheimer's and other neurodegenerative diseases. In recent years, microRNAs (miRNA) have been implicated in many disease processes and their roles in these processes have increasingly been explored. How

MS1-2 LARA, STEVEN

Breast Cancer Mortality of Rural West Texans in High-risk Hale County

Steven Lara MPA MPH Aamrin Ra BSc Summre Blakley MDc Drew Rasmussen MPHc Afrina Hossain MD Lisaann Gittner PhD and Haz Khan PhD

MS1-2 LEE, SHANSHAN

RadiologicalB

MS1-2 LIN, CHRISTINE

Figurate Erythema for Twenty Years

Christine P. Lin, BA, Patrick M. Mulvaney, MD, Christine G. Lian, MD, Fei-Shiuann Clarissa Yang, MD

BACKGROUND: Diffuse large B-cell lymphoma (DLBCL) is the most common and aggressive type of non-Hodgkin lymphoma in adults. If the skin is involved, DLBCL commonly manifests on the legs as papules, nodules, or indurated plaques, but there are a few reported cases of DLBCL presenting in an annular or figurate configuration. We report a case of annular-appearing Primary Cutaneous DLBCL, Leg Type (PCDLBCL-LT), a subtype of DLBCL, which led to delayed diagnosis and treatment.

CASE: A 49-year-old man from New England presented with a twenty-year history of pink, non-scaly, arcuate plaques on the right thigh, unresponsive to mid-potency topical steroids. In the last year prior to presentation, two nodules developed within the plaques. The patient denied having fevers, night sweats, pruritus or weight loss. He denied history of tick bites and lymphadenopathy was appreciated. Biopsies showed superficial to deep dermal perivascular lymphocytic infiltrate comprised of atypical lymphocytes with round to irregular nuclei, dispersed to vesicular chromatin, occasional single nucleoli and moderate amounts of pale eosinophilic cytoplasm. Immunohistochemistry revealed CD20-positive B-cells that stained positively for Bcl-2, Bcl-6, and MUM-1, and negative for CD10. Staging for this patient revealed no extracutaneous disease. The patient underwent six cycles of R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone) plus radiation resulting in complete radiographic

MS1-2 MURPHY, ALEXANDRIA

Perception of Veteran's Healthcare in Medical Education

Alexandria Murphy, Rebecca Kernan, Ellen Wilson, Sterling Rosqvist, Tate Leatherwood, Zachary Mkhantar

Lubbock announced that we will be welcoming our new VA Hospital that will be across the street from UMC and TTUHSC. The new clinic is projected to serve 20 counties in west Texas, expanding greatly their patient population. With the expansion of the clinic students at the TTUHSC will be allowed to rotate at the new clinic. Veterans face many different challenges in the medicine

MS1-2 NARAYANAN, MONISHA

Molecular Pathogenesis of Gouty Arthritis in Hemochromatosis: The Role of ABCG2-Mediated Uric Acid Ef

Monisha Narayanan, Bojana Ristic, Dr. Vadivel Ganapathy

Hemochromatosis is caused by mutations in the iron-regulatory gene HFE, and its clinical manifestations are primarily produced by iron-induced oxidative stress. ABCG2 is a heme pump which could impact iron homeostasis due to its heme exportation, and preliminary studies show down-regulation of Abcg2 in Hfe-null mice, a model for hemochromatosis. ABCG2 also exports uric acid, and mutations in ABCG2 cause excess uric acid and arthritis. As such, iron-induced oxidative stress may not be the only factor responsible for gouty arthritis in hemochromatosis; increased uric acid may also contribute to the etiology, as uric acid promotes the uric acid crystal formation causing gouty arthritis.

We hypothesize that the etiology of hemochromatosis-induced arthritis involves both excess iron caused by loss of function in HFE and excess uric acid caused by down-regulation of ABCG2. This hypothesis was tested by comparing plasma and tissue levels of uric acid in Hfe-null mice to those in wild type mice. The uric acid concentration was significantly higher in Hfe-null serum, colon, and ileum as compared to their age-matched controls. Therefore, we hypothesize that complete deletion of ABCG2 will enhance the uric acid accumulation in wild type and, more significantly, in Hfe-null mice. We have started this study by measuring the uric acid levels in Abcg2-null mice and comparing them to age-matched wild type mice. Surprisingly, uric acid levels were found to

MS1-2 OSEMWENGIE, BRADLEY

Management of postsurgical donor site pain in burn injuries using a preoperative combination of bupivacaine plus liposomal bupivacaine injections

Bradley Osemwengie, Grant Sorensen PhD, John Griswold MD

Introduction: The skin graft donor site is often the most painful part of the healing process in a postoperative burn patient. S

MS1-2 OTI-NIMOH, JOSEPH

Using Transesophageal Echocardiography (TEE) Simulation to Improve Learning Outcomes in Preclinical Medical Students

Joseph Oti-Nimoh, Clayton Wagner, Greg Brower PhD

Learning modules that are incorporated into the TTUHSC School of Medicine (SOM) curriculum are designed to help students better understand key concepts that are covered during lecture and clinical sessions. Learning modules outlining transthoracic echocardiography (TTE) paired with interactive standardized patient (SP) encounters are currently part of the SOM preclinical curriculum; however, these learning resources are not as readily available for transesophageal echocardiography (TEE). Incorporation of a TEE simulation into the preclinical curriculum could be beneficial for a variety of reasons. One of the primary goals of development of this activity is to expand understanding of ultrasonography, specifically echocardiography (echo), among preclinical medical students. With SPs, preclinical medical students can only perform TTE and can only visualize normal anatomy. Using the Heartworks simulator in the TTUHSC SimLife center, both TTE and TEE can be performed. One of the primary advantages using TEE over TTE arises from the close anatomical relationship between the esophagus and the heart. This close anatomical relationship negates the necessity for a low frequency transducer, which is used for TTE, and thus allows the use of higher frequencies while imaging which equates to better resolution and clearer echocardiograms. We believe that the high resolution that is associated with TEE could improve understanding of how echo can be used to visualize cardiac and aorta-related structures. Additionally, the Heartworks simulator has the capacity to simulate cardiovascular (CV) related pathology. We believe that simulating CV pathology with TEE simulation will improve medical student learning outcomes as it pertains to CV pathology. We do not believe that echo simulation using the Heartworks simulator should supplant SP encounters, but it could serve as an adjunct to the SP echo experience that is already incorporated into the preclinical curriculum.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 OWOADE, DAMILOLA

Disparities in colorectal cancer incidence and survival by rural/urban residence in west Texas region compared to the rest of Texas (2005-2015)

Damilola Owoade, MPH(c) 1; Kishor Bhende, MD 2; Theresa Byrd, DrPH1; Duke Appiah, PhD MPH1

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Introduction: In Texas, colorectal cancer is ranked as the third in both cancer incidence and the cause of mortality. Rural counties known to have higher burden of cancer deaths. The west Texas region (WTR) is one of the most medically underserved regions of Texas. Therefore, we evaluated the incidence and survival for colorectal cancer cases in rural and urban counties in WTR compared to the rest of Texas.

Methods: Data were obtained from the Texas Cancer Registry. Survival estimates were obtained using the Kaplan-Maier methods. Cox regression models were used to identify potential factors that explained the disparities in mortality among persons with colorectal cancer by region.

Results: During the years of 2005-2015, 190,891 colorectal cancer cases were recorded. The age-adjusted incidence was higher in urban than rural counties (33.8 vs. 7.1 per 100,000) while the age-adjusted mortality was higher for rural counties with the highest proportion of mortality observed in rural WTR (53%). A greater proportion of cases in rural counties developed cancer at an earlier age, were current smokers and lived in high poverty locations compared to urban resident colorectal cancer cases. The 5-year survival was lower for rural counties regardless of region. Compared to urban residents living in non-WTR, the hazard ratios for mortality for urban counties in WTR was 0.99 (95% CI: 0.97- 1.02); rural-WTR was 1.09 (1.04-1.15) and rural counties not in WTR was 1.11(1.08-1.13). After controlling for age, sex, race/ethnicity, tumor stage at diagnosis, body mass index, smoking and county level poverty, there was no significant difference in the risk of mortality among cancer cases from rural or urban counties ($p>0.05$).

Conclusion: Intervening in behavior and lifestyle factors offers an opportunity to reduce the disparity in survival among rural and urban residents of Texas, regardless of region.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 PEIRIS, CRAIG

Pituitary hyperplasia: A clinical and imaging chameleon.

Craig D. Peiris, MS; Muhittin Belirgen, MD; Roy Jacob, MD

Enlargement of the pituitary gland is usually associated with pituitary adenomas, a condition less frequent in the pediatric population. Pituitary hyperplasia is an under-recognized cause of pituitary enlargement. Pituitary hyperplasia can rarely simulate a pituitary adenoma in children. The best-known example of pituitary hyperplasia relates to Nelson syndrome in which the expansion of the pituitary into adjacent structures occurs following bilateral adrenalectomy for Cushing's disease.

We report the case of an 11-year-old girl with new-onset seizures. She was started on phenytoin for seizure control. An MRI demonstrated a greatly enlarged pituitary, measuring 15 mm in the cranial to caudal dimension, abutting the optic chiasm. The patient had intact visual fields. A second MRI with contrast revealed a homogeneously enhancing pituitary gland raising suspicion for pituitary hyperplasia.

Subsequent testing revealed a markedly elevated TSH value of 60.0 mIU/L (normal range less than 5.0 mIU/L). Serum prolactin level was also elevated at 54.4 ng/mL (normal range less than 23 ng/mL). It is important not to mistake the elevated prolactin due to hypothyroidism with a prolactinoma. Phenytoin can impact free T4 estimation; however, it does not affect TSH value. The marked elevation of TSH in this patient is consistent with severe primary hypothyroidism. The patient was started on thyroid hormone replacement. Follow up MR imaging after three months showed pituitary gland size had decreased to 7 mm in the cranial-caudal dimension with a resolution of the mass effect on the optic chiasm. At last, follow up the patient is doing well.

This case highlights the uncommon presentation of pituitary hyperplasia mimicking a pituitary mass. It is vital that surgery is performed for pituitary hyperplasia.

School: School of Medicine | Campus: Lubbock

MS1-2 PHILIP, STACY

Unilateral Tessier 7 Cleft: Case Report of Z-plasty with Geometric Broken Line Repair and Literature Review

Stacy Philip, Dr. Cynthia Schwartz, Dr. Winslo Idicula, Dr. Joshua Demke

Introduction: Tessier clefts are rare, with an incidence of only 1.43 to 4.85 per 100,000 live births, and Tessier 7 clefts account for 0.3-1.0% of the total spectrum of facial-cleft deformity. Facial clefts typically run parallel to relaxed skin tension lines (RSTLs) whereas Tessier 7 clefts are perpendicular to these lines. Z-plasty, w-plasty, mucosal flaps, Pfeiffer wavy incisions, and straight-line closures have been reported in the literature for reparation, though undesirable scars may result. Geometric broken line closure (GBLC) creates a randomly irregular scar by interdigitating triangles and trapezoids in a random pattern to optimize the ultimate scar.

Case Presentation: We present a review of the literature and a case of a four-month-old female patient with Goldenhar syndrome, right-sided Tessier 7 cleft, macrostomia, preauricular appendages, a branchial cleft remnant on the right cheek, and a type 1 adenoid cystic carcinoma for which a combined z-plasty and GBLC were chosen for surgical repair. The Tessier 7 cleft involved muscular diastasis at the commissure extending laterally toward the tragus. We describe a novel reconstruction technique wherein z-plasty reorients part of the scar parallel to RSTLs, and GBLC further camouflages the scar perpendicular to RSTLs.

Conclusion: Z-plasty repositions a portion of the scar to be parallel to the eventual nasolabial fold and RSTLs. GBLC breaks up a scar that is otherwise both linear and perpendicular to RSTLs by creating small geometric shapes, making the scar less noticeable. We present this case to expand the armamentarium of surgical options to address Tessier 7 clefts.

School: School of Medicine | Campus: Lubbock

MS1-2 PIRES, BRANDON

A Student-Generated, Peer-Led Teaching Activity for MSK and Bone Disorders

Brandon Pires, Kristie Benejan, Taylor Brown, Jacob Darter, Chandon Loya, Emily Mendez, Jackson Reynolds, Joshua Sorenson, Gurvinder Kaur, Cassie Kruczek, Jennifer Mitchell, David Edwards, Betsy Jones

Background: TTUHSC School of Medicine has a 3-year MD curriculum leading to FM residency, the FMAT program. An 8-week course between the M1 and M2 years includes one week devoted to the MSK system. Immediately following, FMAT students participate in the Multisystems Disorders block with their peers in the traditional curriculum, including MSK and bone disorders.

Methods: For this initiative, FMAT students developed a student-generated/ led activity for the MSD course. Objectives were to assess whether FMAT students 1) developed proficiency in MSK exams and clinical reasoning; 2) can serve as effective peer teachers; and 3) perform better on relevant block exams compared to peers. At the beginning of the 2018 FMAT1 course, students measured their baseline knowledge and skills about MSK conditions and tests. During FMAT MSK week, they developed a teaching case for bone disorders for a peer-led session in the fall MSD course. Outcomes include FMAT and traditional student performance on pertinent exam questions during the MSD course.

Results: Significant improvement on MSK related questions was observed following peer-led instruction; however, no significant difference in scores on summative and formative assessments was observed between groups. Small differences in scoring are likely attributable to the in-house unit exam content being broader than the scope of a single STS session. Some limitations in varying population sizes between groups with presenters making up the smallest sample (n=30) and most affected by variation in scores. Also, the formative assessment included questions not from STS session material.

Discussion: Future iterations should include feedback for each presentation, appropriateness to the current block material, and back of the presenter groups. While significant score improvement was not observed, overall, the presentations were regarded as useful and enjoyable and promoted independent learning.

School: School of Medicine | Campus: Lubbock

MS1-2 SANKOORIKKAL, NIKI

MS1-2 SETTERQUIST, HANA

The effect of mild, chronic sleep restriction on kidney function

Hana Setterquist, Marie Pierre St-Onge

Background: Observational evidence suggests a relation between short sleep duration and chronic kidney disease. However, is little experimental evidence on the effects of sleep on kidney function in healthy individuals.

Objective: To evaluate the effect of chronic, short sleep duration on glomerular filtration rate.

Methods: Thirty-one healthy, normally sleeping (7-9h/night) participants without chronic kidney disease (CKD) or diabetes (20 men, 11 women) were randomized to 6 wk of habitual sleep (HS) or sleep restriction (SR= HS -1.5 h) in a crossover outpatient design. Kidney function was measured using estimated glomerular filtration rate (eGFR) at baseline and endpoint of each sleep phase.

MS1-2 SHABANEH, OBADEH

Gender Differences in Prevalence of Myocardial Infarction in Rural West Texans

Obadeh Shabaneh MPHc Aamrin Ha BSc Drew Rasmussen MPHc Summre Blakely MD PhD Han PhD Lisaann Gittner PhD and P Hemachandra Reddy PhD

Heart disease is the leading cause of death in the United States. Incidence rates of myocardial infarction (MI) in rural West Texas signify a lack of effective, risk-specific prevention programs. The purpose of this study was to identify gender-specific factors for MI in rural West Texans as well as identify the nature of the distributional pattern of risk parameter gender differences. Retrospective patient data for those with and without a history of MI were obtained from the Project FRONTIER (Facing Rural Obstacles to Healthcare Now Through Intervention, Education, and Research) database, which aims to observe the long-term impact of a variety of chronic diseases in rural West Texas counties. We used statistical software, such as SPSS, R, and WinBUGS to detect and understand the nature of MI risk factors. Statistical methods like t-tests, Chi-squared, logistic regression, and a Bayesian approach were utilized to analyze data. Additionally, to reduce multicollinearity, we conducted correlation analysis among independent variables and removed variables that had variance inflation factors (VIF) greater than 3. Various MI significant risk factors were obtained for both males and females. For females, they were systolic blood pressure ($p = 0.002$), diastolic blood pressure ($p = 0.004$), pulse ($p = 0.015$), and smoking ($p = 0.002$). Male risk factors included glucose ($p = 0.022$), age ($p = 0.050$), body fat ($p = 0.034$), and smoking ($p = 0.017$). The mean risk parameter followed a normal distribution while the precision parameter depicted skew for both gender. Since gender-specific differences in MI risk factors exist, incorporating such variables can guide relevant policymaking to reduce MI incidence in rural West Texans. Since smoking is a risk factor for both genders, we recommend population-based epidemiologic research to estimate the potential benefit of targeted health care and public health efforts within rural West Texas communities.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 SMITH, NICHOLAS

Water Softener Combinations Promote Growth of Pseudomonas

Cody Fell, Dr. Kendra Rumbaugh, Nicholas Smith

Pseudomonas aeruginosa is an opportunistic pathogen that has a prominent role in nosocomial infections. Its success as an opportunistic pathogen is greatly enhanced by its ability to make *kerbans*, which are polysaccharide-rich structures that surround and protect the bacteria. Patients that are immunocompromised or have other underlying issues commonly become infected with this organism. Hospital staff have procedures in place to eradicate bacteria throughout the hospital in order to prevent nosocomial infection, but despite these efforts, many patients still become infected *P. aeruginosa*. We have seen persistent high levels of *aeruginosa* infections at our institution (TTUHSC and UMC), which exceed national levels. Our hypothesis for this study was that the increased rates of *P. aeruginosa* infections are at least in part due to the type of water softeners used by the City of Lubbock and UMC. Specifically, we propose that chloramine, used by the city, and phosphates, used by the HSC, may promote growth and support the persistence of *P. aeruginosa*. By testing the growth of *P. aeruginosa* *in vitro*, we observed that the presence of both a phosphate and nitrogen source promoted the growth of *P. aeruginosa*. Our results support current efforts being made by the institution to alter water-softening strategies.

School: School of Medicine | Campus: Lubbock

MS1-2 THOMPSON, CHRIS

Incidence of Depression in Medical Training: a longitudinal study

Christopher Thompson, James Bunch, Paul Duggan, Allison Perrin

Medical students and residents are faced with substantial academic, psychological, and existential stressors during and after medical school. Resultantly, it has been previously shown that medical students are at an increased risk of developing depression as feelings of burnout relative to the general population. Additionally, prior studies have suggested that students' mental health declines once beginning medical school and typically remains reduced throughout medical training. This phenomenon may lead to an increased risk of adverse outcomes personally and in the context of medical training and physician retention. It is therefore prudent to study the prevalence of symptoms and incidence of depression among students across the years of medical training. We are conducting a longitudinal observational study to evaluate the incidence of sadness and depression among medical school students both undergraduate and graduate, at Texas Tech University Health Science Center School of Medicine, across multiple years using

MS1-2 TURNER, AUSTIN

Alternative Lengthening of Telomeres: Frequency of a Possible New Therapeutic Target

Austin Turner

Immortalization is a key to cancerous transformation. Telomerase is often expressed to achieve this, preventing the loss of DNA material after multiple rounds of mitosis. The Alternative lengthening of telomeres (ALT) pathway is a method of immortalization utilizing non-chromosomal circular DNA molecules to replicate and arrange telomeric DNA (C-Circles) rather than telomerase. ALT can present insensitivity to treatment due to lacking telomerase and a high degree of DNA damage tolerance, but may present new targets for therapy. This project intended to identify the presence of ALT in patient derived cell lines, research models, and in patient tumor samples to elucidate the clinical frequency of ALT.

DNA was extracted from frozen cell pellets as well as from patient tissue samples, and run in a PCR using a bacterial circular polymerase to amplify telomeric DNA contained in C-Circles. The results were assessed using QT-PCR against established ALT positive and negative controls. Samples were also investigated for telomerase expression using RT-PCR for telomerase mRNA. Telomere length, using QT-PCR. ALT positivity was determined by the presence of C-Circles at greater than 1/3 of positive control telomerase negativity, and a high degree of telomere content.

The cell study included 286 cell lines and found positivity in 1 breast, 3 colon, 1 lung, 3 lymphoma, 1 myeloma, 4 osteosarcoma, 1 ovarian, 7 neuroblastoma, 3 rhabdomyosarcoma, and 1 leiomyosarcoma lines. The patient study has run 53 samples of colorectal PNET, and pancreatic cancer, including 1 positive PNET.

These results show that while ALT is rare, it can exist in many cancer types, may be more prevalent than thought, and the estimate of prevalence from the cell study may underestimate the true prevalence as ALT cancers often do poorly in culture. All cell lines and patient samples continue to be screened, and work has been done to extract DNA from patient samples for eventual screening.

School: School of Medicine | Campus: Lubbock

MS1-2 UMELO, JONATHAN

The role of Sm-p80-specific antibodies in protection against *Schistosoma mansoni* challenge infection in mice

Jonathan Umelo^{1,2}, Adebayo J. Molehin^{1,2} and Afzal A. Siddiqui^{1,2}

Schistosomiasis remains a major global health issue caused by parasitic helminths belonging to the genus *Schistosoma*. There are major schistosome species that can cause infection in humans. *Schistosoma mansoni*, the major cause of schistosomiasis in Africa and South America, will be the focus of this study. *S. mansoni* lives in fresh water snails. The cercariae (infectious form) emerge from the snail and contaminates fresh water. The cercariae penetrates the skin of individuals who come in contact with the contaminated water leading to intestinal disease. Over 240 million people are estimated to be currently infected worldwide with the majority being school-aged children. Current control measures centered on mass drug administration of praziquantel are inadequate due to lack of sustainability, inadequate coverage and sustained re-infection rates. Hence, there is an urgent need for the development of an effective schistosomiasis vaccine for long term protection. In addition, experts believe that elimination of schistosomiasis is feasible through an integrated approach combining current control measures with an effective schistosomiasis vaccine. Previous efficacy studies by our group have shown that the large subunit of *Schistosoma mansoni* calpain, Sm-p80, conferred immune protection against *S. mansoni* infections in rodents and non-human primate models of infection and disease. A balanced Th1/Th2 immune response in immunized animals are thought to be associated with immune protection against schistosomiasis. However, our understanding of the mechanisms involved in Sm-p80-mediated immune protection is limited. In this present study, we evaluated the role(s) of passively-transferred Sm-p80-specific antibodies in vaccine-mediated immunity against *S. mansoni* infections in C57BL/6J mice. We report a significant worm burden reduction of 53.7% ($p=0.034$) in experimental mice compared to their control counterpart. We also observed moderate reduction in liver egg burden (36%) and intestine egg burden (10%) de[rr[trating]]

MS1-2 WAGNER, CLAYTON

Using Systematic Oral Care to Prevent Hospital-Acquired Pneumonia in Non-Mechanically Ventilated Patients: A Preliminary Study

Clayton Wagner, Brandon Bradley, Alec Egan, Clarissa Ramirez, Elmira Ahnood, Maricela Chavez, Cynthia Jumper, MD, MPH

In March of 2015, a research article was released which showed significant reductions in Hospital Acquired Pneumonia (HAP) rates over a two-year period following implementation of a simple oral hygiene protocol in admitted non-ventilated patients. A series of similar studies have been performed in a variety of hospital settings in the years since and have yielded similar results. This element of care appears to make a significant impact on HAP rates, though its role is not definitive. This study sought to determine HAP rates among admitted patients at UMC in Lubbock, TX and to advocate for policy changes, if warranted. Our group approximated UMC's HAP rates using semiannual American College of Surgeons (ACS) NSQIP reports, as well as MedMined quarterly nosocomial infection marker (NIM) scorecards from January 2015 to April 2017. ACS guidelines for the avoidance of respiratory complications and primary literature were compared with UMC policies. Using the aforementioned resources, a new policy for systematic oral care in non-ventilated patients was then produced. We determined that from January 2015- April 2017 UMC had rates higher than NSQIP expected rates for HAP. NIM scorecards showed that HAP represented approximately 20% of the total recorded nosocomial infections at UMC over the same time period. Additionally, there was no policy for routine oral hygiene for admitted non-ventilated patients. Our group brought these results to the attention of UMC's administration and then produced an oral care policy which was ultimately approved by the surgical ICU nursing unit-based council and was subsequently made into a hospital-wide protocol. HAP is a significant cause of morbidity and mortality nationally. Recent studies have shown the connection between routine oral care and the avoidance of HAP in non-ventilated patients. We hope the implementation of our oral care protocol will have significant influence on HAP rates among patients at UMC.

School: School of Medicine | Campus: Lubbock

MS1-2 YOUNG, JONATHAN

Differentiation of Patients with Vestibular Hypofunction vs Normal Subjects Using a Low Cost Small Wireless Wearable Gait Sensor

Jonathan H Young and Tam Q Nguyen and Amanda Rodriguez and Steven Zupancic and Donald YC Lie

Balance disorders present a significant healthcare burden due to the potential for hospitalization or complications for the patient, especially among the elderly population when considering intangible losses such as quality of life, morbidities and mortalities. This work is a continuation of our earlier works where we now examine feature extraction methodology on Dynamic Gait Index (DGI) tests and machine learning classifiers to differentiate patients with balance problems versus normal subjects on an expanded cohort of 60 patients. All data was obtained using our custom-designed low-cost wireless gait analysis sensor (WGAS) containing basic inertial measurement unit (IMU) worn by each subject during the DGI tests. The raw gait data is wirelessly transmitted from the WGAS for real-time gait data collection and analysis. Here we demonstrate predictive models that achieve high accuracy, sensitivity and specificity in distinguishing abnormal from normal gaits. These results show that gait data collected from our very low-cost wearable wireless gait sensor can effectively differentiate patients with balance disorders from normal subjects in real time using various classifiers. Our ultimate goal is to be able to use a remote sensor such as the WGAS to accurately stratify an

MS3-4 ADAMS, KAKA

Scrupulosity-type OCD symptoms in a Child with Pediatric Acute Neuropsychiatric Syndrome (PANS) Following Acute Otitis Media (OME)

Adams KL, Kureishy MK, Ahmed AF, Chalia A, Rivera R

Pediatric Acute Neuropsychiatric Syndrome (PANS) is a rare clinical condition characterized by acute onset of OCD, tics, other psychiatric symptoms due to infection. Scrupulosity-type OCD is characterized by excessive guilt and ruminations over on thoughts and actions, as well as compulsive behaviors such as confessions, prayers or rituals. We present a unique case of a

MS3-4 ARGUE, JAY

Eczema Herpeticum: Recognition and Treatment

Jay (Riley) Argue B.S., MS3 & Robert Alexander B.S., MS3 Mentor: Dr. Naqvi MD

Patients with atopic dermatitis are at risk of developing a secondary viral infection. One of the most severe forms of this secondary infection is with HSV-1 and this is called "eczema herpeticum." Patients taking immunosuppressive agents to treat their atopic dermatitis or other skin pathology are at increased risk of secondary infection. Eczema herpeticum presents with painful and rapidly expanding skin lesions secondary to HSV-1 spread. If the patient has severe eczema, differentiating eczema herpeticum may be difficult.

Case: A 15 year old male presented with a rash that started two days prior. Patient has a history of eczema but states this rash is like anything he's ever experienced before. He had moderate eczema at baseline. Two days prior, the patient developed a blistering rash that started on his hands and buttock as diffuse 1 cm pustules with a clear slightly yellow accumulation underneath. They spread from his hands to his trunk and other extremities. Two to three hours after the pustules appeared they began to rupture and began to ooze a clear/yellow fluid.

Conclusion: Atopic dermatitis and other disorders of the skin predispose individuals to eczema herpeticum. A disease caused by the dsDNA virus Herpes Simplex of the family Herpesviridae. This disease is a dermatologic emergency that can lead to blindness and potentially death when misdiagnosed or improperly treated. The most common complication is bacterial superinfection and an antibiotic regimen should be added, taking care to cover the most common culprit, Staphylococcus aureus. Diagnosis requires an index of clinical suspicion coupled with PCR and culture studies and treatment with acyclovir should be initiated immediately. Any patient presenting with papulovesicular lesions with punched out ulcers should be carefully evaluated for potential infection and treated accordingly.

School: School of Medicine | Campus: Amarillo

MS3-4 ASAD, USMAN

Paraneoplastic Eczematous Eruption Associated With Hodgkins Lymphoma

Usman Asad BS Brett Austin MD Ashley Sturgeon MD Cloyce Stetson MD

Hodgkin's disease (HD) is a common malignant lymphoma. Unlike other lymphoproliferative disorders, cutaneous involvement with HD is uncommon. We present a case of a 28-year-old Caucasian female who presented to our dermatology clinic with a 1 month history of lymphadenopathy of the right supraclavicular fossa, a 2 month history of lymphadenopathy of the right axilla and severely pruritic eczematous dermatitis. She was initially prescribed antibiotics, but in the ensuing months, she developed a widespread diffusely pruritic rash. Skin examination was significant for multiple nummular eczematous scaly plaques distributed over the bilateral upper and lower extremities, abdomen, and right eye. Two 4mm punch biopsies were obtained of the skin of the left upper arm and left lateral calf. Regular epidermal acanthosis with spongiosis, moderate exocytosis of lymphocytes into the spongium, and a superficial perivascular lymphocytic infiltrate with rare neutrophils were observed. Histologic findings were interpreted as a spongiotic psoriasiform dermatitis that was suggestive of subacute to chronic eczema or contact dermatitis. WBC blood cell count was $8.5 \times 10^9/L$, with 81.8% granulocytes and 14.5% lymphocytes, hemoglobin 12.2g/dL, and hematocrit 37.3%. Biochemical studies were within normal limits. A specimen from excisional biopsy of the right supraclavicular lymph node showed classical Hodgkin's lymphoma (nodular sclerosis type) positive for CD15 and CD30. The patient was treated with two cycles of adriamycin, bleomycin, vinblastine, and dacarbazine chemotherapy; her eczema and pruritus resolved after the second cycle suggesting a paraneoplastic phenomenon.

School: School of Medicine | Campus: Lubbock

MS3-4 BAKER, BERNADETTE

The Impact of Step Two Course on Step Two CS Outcomes and Satisfaction

Bernadette Baker

Step 2 CS is a significant component of a medical student's residency application. Residency program directors, in particular family medicine program directors, have cited this exam as being an important factor in both interview invitation and ranking applicants for match. Texas Tech Health Sciences Center School of Medicine students had a decline in performance from a 99% pass rate to a pass rate of 93% over a four-year period. In response, the Family Medicine Interest Group developed a Step 2 CS "crash course" (a

MS3-4 BLAY-TOFEY, MORKEH

Government Political Structure and Gender Differences in Violent Death: A Longitudinal Analysis of Forty-Three Countries, 1960-2008

Morkeh Blay-Tofey, Phillip Marotta, Ph.D, Bandy Lee, M.D., M.Div, James Gilligan, M.D., Kelsey Schuder

Objectives: Little global and longitudinal scholarship exists on the relationship between regime type and mortality over time. The purpose of this study is to examine the effect of democracy on violent death rates (homicide, suicide, and combined) by gender (men and women).

Methods: Three measures of democracy were used to quantify regime type. Homicide and suicide rates were obtained from the World Health Organization. Multi-level regression analyses examined associations between regime characteristics and logged rate of homicide, suicide, and violent deaths. Models were adjusted for unemployment and economic inequality.

Results: Nations that scored higher on democracy indices, especially emerging democracies, experienced increased mortality due to violence. Women possessed higher rates of homicide and suicide in democracies compared to men.

Conclusions: Violent deaths appear to be more prevalent even in stable democracies, and women are more affected than men. This study overturns the common assumption that democracies bring greater equality, and therefore lower death rates over long-term. Future analyses might examine the aspects of democracies that lead to higher rates of violent death so as to help mitigate them.

School: School of Medicine | Campus: Lubbock

MS3-4 BROGAN, JOSHUA

Acute Pancreatitis with Normal Amylase and Lipase

MS3-4 BYRD, ALYSSA

Incidental Finding of Right-Sided Aortic Arch

David Foley, MS3⁽¹⁾, Alyssa Byrd, MS3⁽¹⁾, Chandralekha Ashangari, M.D.⁽²⁾, Muath Alsharif, M.D.⁽²⁾, Richard Murray, M.D.⁽³⁾

(1)TTUHSC School of Medicine, (2) Internal Medicine Residency Program, Texas Tech University Health Sciences Center Amarillo, (3) Department of Radiology, Northwest Texas Healthcare System

Introduction: In this case, we explore an incidental finding of Right-Sided Aortic Arch (RAA). RAA is rare and can be associated with cardiovascular anomalies. Aortic malformation beginning in the 4th-7th weeks of embryogenesis is responsible for RAA.

MS3-4 CABALLERO, BEATRICE

Open Abdomens with Ongoing Intraabdominal Pathologies Successfully Closed Using a Dynamic Tissue System and Biologic Xenograft

Beatrice Caballero MS, Yana Puckett MD, Michelle Estrada MD, Shirley McReynolds, Robyn E. Richmond, MD, Catherine A. Ronaghan MD, FACS

Introduction: Closure of catastrophic open abdomens (OA) after damage control laparotomy presents many challenges, particularly in complex pathologies that make achieving myofascial closure exceedingly difficult. This case series presents an alternative approach for definitive myofascial closure and accelerated wound healing in the setting of OAs with ongoing intraabdominal pathology. The implantation of Porcine Urinary Bladder Matrix (PUBM) allows for primary skin closure of contaminated wounds.

Methods: 5 patients managed with the ABRA Dynamic Tissue System (DTS) in combination with a PUBM xenograft. PUBM particulate is implanted directly on the myofascial closure. A PUBM 2-layer sheet is then placed subcutaneously utilizing a suture technique followed by definitive skin closure. Data was collected on the mechanism of injury, patient presentation, surgical management and patient outcomes via retrospective chart review. All 5 patients presented to our tertiary referral center for emergency general surgery issues or penetrating traumatic injuries. These patients had ongoing complex intraabdominal pathology, including a duodenal stump blowout, anastomotic failures (ileocolonic, colocolonic and hepaticojejunostomy/jejunajejunostomy) and pancreaticoatmospheric fistula associated with multiple intraabdominal injuries sustained following an abdominal gunshot wound.

Results: Average maximum myofascial gap was 22.8 cm (range: 11cm - 29cm). Average visceral extrusion was 9.2 cm (range: 4.5 - 13cm). The DTS remained in place an average of 11.6 days (range: 8-14 days). Delayed primary myofascial closure was achieved in 5/5 patients (100%) with no fascial dehiscence or surgical site infection (SSI) observed.

Conclusion: This technique essentially eliminated the need for negative pressure wound therapy postoperatively. Utilization of DTS in conjunction with a xenograft combines both mechanical and biologic advantages for definitive closure and complete wound healing.

School: School of Medicine | Campus: Lubbock

MS3-4 CALLIER, KYLIE

Pilot Study to Assess Barriers to Colorectal Cancer Screening in Rural African American Populations

Jefferson Lines MS3, Kylie Callier MS3, David Foley MS3, Dr. Izi Obokhare MD

Previous studies have shown decreased rates of colorectal cancer (CRC) screening in underserved populations, African-American and rural populations. In this descriptive study we aim to elucidate potential barriers to CRC screening for these populations by examining the shared experiences of members of a population who satisfy three criteria, underserved African-Americans in the rural Texas panhandle.

In an effort to improve the outreach of our own CRC screening program, Get F.I.T. to Stay Fit, we recruited 12 members of underserved, rural, African-American population to participate in focus group sessions, and relate their own experiences with CRC screening. The focus group consisted of 12 individuals, 6 females and 6 males, and lasted an hour and a half in length. We asked them to identify the barriers to CRC screening they have encountered in the past. The most commonly identified barriers were distrust of doctors, fear of unpleasant experiences when prepping for and undergoing CRC screening, misconceptions about the effectiveness of treatment in improving outcomes, lack of access and transportation, and social stigma regarding the invasive nature of colonoscopies.

While these individual experiences on barriers to CRC screening do not constitute a definitive solution to the problem, they do provide a productive starting point for further research and will be a launching pad for our work involving larger populations of African-Americans. By first examining the issue through the perspective of those most affected by it, it is our hope their experiences will help direct future research on CRC screening outreach towards more evidence-based outcomes.

School: School of Medicine | Campus: Lubbock

MS3-4 COOK, ELIZABETH

The impact of obesity and sex on necrotizing soft tissue infection mortality

Hannah Zhao-Fleming, PhD, Elizabeth Cook, Armand Northcut, Diana Mitchell, Crystal Ike, Kendra Rumbaugh, PhD, Sharmila Dissanaik, MD

Necrotizing soft tissue infections (NSTIs) are rapidly progressive infections of the skin and underlying tissue. Despite aggressive treatment, mortality is still high (~25%). The focus of this study is to determine if obesity is associated with a worse clinical outcome or prolonged hospital course in NSTIs. We conducted a retrospective chart review of NSTI patients presenting to University Medical Center in Lubbock, Texas from 2010-2017 (88 patients total). All patients had their BMI measured at intake and the decision to include a computed tomography (CT) scan was based on clinical judgement at the time of hospitalization. In patients who received a CT scan during their admission, abdominal fat thickness at vertebral level L4/L5 was measured. We found no association between either BMI or CT fat thickness at L4/L5 with mortality. Additionally, there was no association between our measures of

MS3-4 DADASHAZAR, SAMAREH

Chronic Granulomatous HSV Encephalitis in a Child

Samareh Dadashazar, Jovaria Khalid, Daniel Hurst, MD, Roy Jacob, MD, Fatma Levent, MD

Herpes simplex virus (HSV), type 1 and 2 are enveloped, double-stranded linear DNA viruses that infect the sensory nervous system after inoculation through the mucosa or breaks in the skin. Most neonatal infections with HSV are introduced during passage through the birth canal in a mother with active shedding of the virus, but infection can also be acquired transplacentally and orally after contact with oral or skin lesions. Encephalitis with HSV classically involves the temporal lobes but in neonates the brain can be involved. The clinical presentation includes irritability, lethargy, fever, poor feeding, and seizures within the first few weeks of life. Neonatal HSV encephalitis is typically an acute disease treated with intravenous acyclovir for a total of 21 days followed by prophylaxis until 6 months of age. Rarely, though, neonates have been found to develop a chronic granulomatous disease later in childhood in response to the infection, despite appropriate treatment.

We present a case of a 4-year-old female who is brought to the emergency department at University Medical Center for 1-minute tonic-clonic seizure, worsening right-sided weakness, slurred speech and left-eye ptosis. The patient was born vaginally at term to a mother with no prenatal care who tested positive for methamphetamines during pregnancy. Patient was diagnosed with neonatal HSV encephalitis as an infant leading to acquired right sided cerebral palsy, epilepsy, developmental delays, and recurrent herpes labialis despite appropriate treatment. After admission, extensive workup ruled out an infectious or autoimmune etiology of encephalitis and the patient was subsequently diagnosed with chronic granulomatous HSV encephalitis per magnetic resonance

MS3-4 DANAJ, ALEXANDER

Never-ending Nipple Discharge

Alexander Danaj, Haley Belt

Introduction: Galactorrhea is the spontaneous flow of milk from the breast, unassociated with childbirth or nursing, and can affect men or women for a variety of reasons. The most common cause for galactorrhea is idiopathic, meaning no cause is identified. Approximately 35% of galactorrhea is idiopathic. In these cases, prolactin may be found to be elevated (hyperprolactinemia) for an unidentified reason, or prolactin can be normal (euprolactinemia), such as in this patient. We present an unusual case of a patient with euprolactinemic galactorrhea.

Case Report: Patient is a 34 year-old G5P3023 who presents in 2018 with a 5 year history of bilateral galactorrhea cessation c after she stopped breastfeeding her last child in 2011. Two years later in 2013 galactorrhea began. She had a detailed workup including TSH, prolactin, pituitary MRI, and mammogram, all of which were normal.

Discussion: The initial workup for galactorrhea is b-HCG, prolactin level, TSH, and renal function tests. In this patient, who

MS3-4 DASH, AKSHAR

A Curious Case of Primary Pancreatic Lymphoma

Akshar Dash Francis Mogollon Duffo MD Fred Hardwicke MD Lisa Smith DO

Primary pancreatic lymphoma (PPL) is a rare case of pancreatic malignancy caused by a form of non-Hodgkin's lymphoma. Only a few cases of PPL have been reported with fewer than 2% of extra-nodal malignant lymphomas and fewer than 0.5% of pancreatic malignancies representing PPL. PPL presents with abdominal pain, weight loss, and jaundice; thereby, closely mimicking the symptoms of pancreatic adenocarcinoma. In addition, Carbohydrate Antigen 19-9 (CA 19-9), an important tumor marker for pancreatic adenocarcinoma, can also be elevated in PPL. Over 80% of cases involve a mass located at the pancreatic head along with enlarged retroperitoneal lymph node involvement. PPL is more responsive to chemotherapy than pancreatic adenocarcinoma, and therapy consists of the R-CHOP regimen for non-Hodgkin's lymphoma: Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, and Prednisone. We report a case of a 77-year old man who was hospitalized for diffuse abdominal pain, jaundice, and weight loss. CT revealed a pancreatic mass with lung metastases and pancreatic and lung biopsies revealed Diffuse Large B-cell lymphoma, leading us to the diagnosis of PPL with lung metastases. Due to concerns for toxicity, the patient was treated with a R-CHOP regimen (Rituximab, Cyclophosphamide, Mitoxantrone, Vincristine, and Prednisone), which is an alternative to R-CHOP therapy for treating diffuse large B-cell lymphoma.

School: School of Medicine | Campus: Lubbock

MS3-4 DIXON, TIMOTHY

A Case of Disseminated Coccidiomycosis in a Nonimmunocompromised Patient in West Texas

Timothy Dixon, Brandon Mccarty, Austin Lunney

Pt is a 25yo African American male who presents to the ED with a painful abscess on his chest. He noted this abscess 3 days ago and stated that it was about 1cm in width. Today he states that it is now 3cm in width, has ruptured, and is now draining. The abscess is located on the anterior chest localized over the body of the sternum. He describes the pain from the abscess as a "burning pain" The pain was initially a 2/10 and is now currently a 7/10. The pain does not radiate. He noticed this when he was working his job as a truck driver in Midland, where he states he frequently is in dusty areas. Nothing seems to make the pain better or worse. Associated symptoms include a nonproductive cough. He denies fever, weight loss, dyspnea, or night sweats. He has had these symptoms on average 3x/year since 2014. Each of these symptoms have been followed up by a diagnosis of coccidiomycosis.

On physical exam an draining 2x2cm abscess was visible on the chest with surrounding erythema. He also had a large 12x14 cm nodule over his right scapula that was warm and indurated. A CT of the chest, abdomen, and pelvis was obtained.

The results showed densities in his thorax and spine.

MS3-4 ESQUIVEL, ESTEBAN

Laparoscopic Omental Patch Reduces Length of Stay and Complications in Perforated Peptic Ulcer Disease: a SWSC Multicenter Study

E Esquivel, J Lung, A Alhaj Saleh, B Eaton, BR Bruns, G Barmparas, DR Margulies, A Raines, C Bryant, CE Crane, EP Scherer, TJ Schroepfel, E Moskowitz, J Regner, R Frazee, EM Campion, M Bartley, S Gordy, J Ward, S Dissanaik

Background: Randomized studies have shown benefit of Laparoscopic (Lap) repair of perforated peptic ulcer (PPU); however it is unclear how often these procedures are performed in general practice, and whether they are consistent across populations. The SWSC Multi-Center Trials Group sought to evaluate whether Lap omental patch repairs compared to Open improved outcomes in PPU

Methods: Data from patients who had omental patch repair for PPU at 9 SWSC institutions from 2011 -2018 were analyzed. Patients undergoing additional or alternate procedures, such as vagotomy or Bilroth II were excluded. Variables included demographics, Charlson Co-morbidity Index (CCI), operative time, 30-day complications, length of stay (LOS) and mortality. Analysis was performed with SPSS.

Results: Omental patch was performed in 465 patients: Open in 312 (67%) patients, Lap in 132 (28%) with 21(5%) patients converted from Lap to Open, who were excluded from analysis. Groups were similar at baseline, except Lap was more commonly

MS3-4 GAVIN, MEREDITH

To Be or Not to Be: Contrast Induced Generalized Bullous Fixed Drug Eruption versus Stevens-Johnson Syndrome

Meredith Gavin, BS; Kendra Walker, BS; Leigha Sharp, MD; Emily Behrens, MD; Russell Akin, MD

A 59-year-old black female with a past medical history of hypertension, hepatitis C, and end-stage renal disease on hemodialysis presented to the emergency department with painful, dusky brown-red atypical targetoid macules and patches with superimposed tense bullae primarily on the bilateral lower extremities but also involving her upper extremities, trunk and face affecting 20% total body surface area. Two days prior, the patient underwent a CT angiogram after complaining of a severe headache. During administration of an iodinated non-polar radiocontrast media (iohexol), she experienced discomfort and pruritus. That evening, she noticed a painful, pruritic rash on her lower legs that subsequently worsened the following day. Upon chart review, it was discovered that the patient had three previous episodes of a generalized, bullous eruption: after a thrombectomy, and an arteriovenous fistula revision. All of these procedures required iohexol administration. Biopsies taken after the second eruption demonstrated full-thickness epidermal necrosis, and she was diagnosed with Stevens-Johnson Syndrome (SJS) thought to be due to her allopurinol use. However, despite medical advice she continued taking allopurinol for gout and was without symptoms until the third eruption. Based on the clinical appearance and timeframe of the eruption after radiocontrast infusion, the patient was diagnosed with generalized bullous fixed drug eruption (GBFDE) due to iohexol. She was treated with topical clobetasol and radiocontrast was highlighted as an allergy in her medical record. Generalized bullous fixed drug eruption is a drug reaction with well-demarcated, dusky circular

MS3-4 JACOB, DARON

Older patient age and longer duration of symptoms significantly increases perforation risk in appendicitis; time to operation and antibiotics do not.

Keith Hanson BA, Daron Jacob BS, Adel Alhaj Saleh MD, Sharmila Dissanaikie MD

Introduction: Controversy exists regarding how quickly an adult with appendicitis requires surgery to prevent perforation and higher risk of post-operative complication; the recent literature on antibiotic use pre-operative treatment has complicated this question further. We hypothesized that longer time to surgery would be associated with an increased incidence of perforations in patients with an initial diagnosis of non-perforated appendicitis, regardless of timing of antibiotics.

Methods: A retrospective review of adult patients with acute appendicitis from 2012-2017 with initial CT read of non-perforated appendicitis. We measured reported time of symptom onset, presentation to ER, antibiotic administration and surgery to evaluate association with intra-operative diagnosis of perforation. A logistic regression model was used to test the relationships.

MS3-4 KIBUULE, GRACE

Atypical Kawasaki disease secondary to Streptococcal pyogenes pneumonia in a healthy female toddler

Grace Kibuule, Montana O'Dell, Vijay Linga

Group A Streptococcus (GAS, Streptococcus pyogenes) is a major cause of bacterial illness in children and adolescents. We report the case of a 2-year-old female who recently migrated from Guatemala that presented with GAS pneumonia with pleural effusion and empyema that received appropriate therapies of PE drainage, antibiotics and supportive care. Despite standard treatment of she continued to have recurrent high-grade fever with severe respiratory distress which required 12 days of care. Further laboratory studies, imaging, and physical presentation lead to a high index of suspicion for atypical Kawasaki disease. Our suspicion for atypical Kawasaki was confirmed with patient's immediate, positive response to treatment with IVIG and high-dose aspirin. Other possible etiologies including drug fever, sepsis, malignancy, tuberculosis, malaria, and endocarditis were ruled out. A literature search revealed very limited number of case reports showing an association between GAS pneumonia with pleural effusion and atypical Kawasaki disease in a healthy female toddler.

School: School of Medicine | Campus: Amarillo

MS3-4 KIRKPATRICK, CARSON

Incidental Superficial Leiomyosarcoma treated with Mohs micrographic surgery

Carson Kirkpatrick, BS; Brett Austin, MD; Jeannie Nguyen, MD; Leigha Sharp, MD; Ashley Sturgeon, MD; Cloyce Stetson, MD

We report a case of a 79-year-old male who presented for treatment with Mohs micrographic surgery (MMS) of a 20x12 mm erythematous eroded nodule on the left forehead with an initial biopsy diagnosis of poorly differentiated squamous cell carcinoma (SCC) with sarcomatoid transformation and spindle cell morphology. Due to clinical presentation and spindle cell morphology, the first stage involved debulking and was sent to pathology. No tumor was noted after two stages. Pathology showed malignant spindle cell tumor in the dermis with numerous atypical mitoses. Smooth cell actin was strongly and diffusely positive. CD10 showed focal positivity. Pancytokeratin showed tumor positivity of less than 10%. Thus, the diagnosis of superficial leiomyosarcoma (SL) was made. SL is a rare neoplasm derived from smooth muscle making up about 3% of all soft-tissue sarcomas. Patients typically present in middle age with no gender preference. SL usually presents as a subcutaneous nodule or plaque commonly on extremities but can appear anywhere on the body. Histologically, SL appears as spindle cells with atypical mitoses. Thus, it can be mistaken for SCC if the differential is not kept in mind and immunohistochemistry not performed. Currently, treatment recommendations commonly include wide local excision with 1-5 cm margins with recurrence up to 40%. In last few decades, SL has been treated with MMS with reports of recurrence of less than 20% and the advantage of tissue sparing. Our patient will be closely followed every six months to monitor for recurrence.

School: School of Medicine | Campus: Lubbock

MS3-4 LE, AUDREY

Developing a Database for Forensic Analysis: Impact of Exposure Time and Water Temperature on Scald Burns in Human Skin.

Audrey Le BA, Evan Nix BS, Natalie Tully BS, Sharmila Dissanaik MD

Introduction: It has been previously published that scald severity is related to water temperature and length of exposure in a linear manner¹. There have been numerous studies utilizing simulation to validate this model², but minimal study has been done on human tissue. Additionally, other studies have shown that increasing the surface temperature of skin results in an increase in tissue temperature as the exposure lengthens in time³. Therefore, the model will be challenged by exposing freshly amputated or otherwise surgically removed skin to discrete insults at given temperatures and times, and then determining how temperature and time alter scald severity. This study will make use of human skin that is removed in amputations, abdominoplasties, and panniculectomies to determine the relationship of time and temperature to scald severity.

Methods: Patients undergoing elective removal of healthy skin (eg. abdominoplasty) donated the removed tissue for this experiment. Immediately after surgical removal, skin was cut into 2cm x 2cm samples and was exposed to water baths of varying temperature for intervals starting at 1 second, and increasing in length by 1 second per trial until second and third degree burns visualized, or a time period of 300 seconds was reached. Pictures were taken of skin samples before exposure, and then after 2- and 3- degree scalds had been visualized.

Results: Skin was obtained from 20 subjects varying in age and representing myriad racial and ethnic groups was obtained, of which 9 were excluded due to incorrect experimental technique and incorrect specimen location. As seen in Tables 1 and 2, time to 2- and 3- degree burn decreased rapidly as water temperature increased.

Conclusions: There is variability in time to scald in human skin at lower temperatures, which narrows with increasing water temperature. There are individual differences in time to scald which likely represent a complex interplay of a variety of patient factors.

School: School of Medicine | Campus: Lubbock

MS3-4 LINDGREN, TAYLOR

IgG4-Related Sclerosing Disease Involving The Extradural Tissue: A Diagnostic Challenge with Dramatic Response

Taylor Lindgren, MS4; Deborah Lin, MS3; Nooraldin Merza, MD, PGY2; Ahmed Taha, MD, PGY3; Mazin Saaldin, MD

Immunoglobulin G4 (IgG4)-related sclerosing disease is known for forming soft tissue mass lesions that may have compressive effects. The most frequently involved area is the pancreas presenting as autoimmune pancreatitis, and the disease may also present as sclerosing cholangitis or in salivary glands, lacrimal glands, or other tissues. In our case report, we describe a challenging diagnosis of IgG4-related sclerosing disease affecting a 60-year-old female who presented with cervical spinal cord compression and multiple neurological features. After laminectomy and excision surgery, the mass was revealed to have dense lymphoplasmacytic cell infiltration and stromal fibrosis with IgG4 and plasma cells. The patient's neurological symptoms and ability to perform daily activities improved dramatically after starting pulse maintenance doses of steroids. This case was challenging and interesting because--while idiopathic hypertrophic pachymeningitis commonly causes spinal cord compression--there are no other cases that describe extradural IgG4-related sclerosing disease presenting with spinal cord compression. Thus, this unique case is important to keep in mind as a clinician, especially because of its dramatic response to treatment.

School: School of Medicine | Campus: Amarillo

MS3-4 LUNNEY, AUSTIN

Supraclavicular Lipoblastoma

Austin Lunney Karla Leal John Fitzwater

Introduction: Lipoblastoma is a rare soft tissue tumor that occurs mainly in the abdomen and extremities in infants and children however, few cases have been found in the neck.

Presentation of case: We present a case of a 19-month-old male that had an enlarging mass on the left cervical region of his neck. He underwent an en bloc resection and pathology described a lipoblastoma. He had no post-operative complications.

MS3-4 MACLEAY, KATELYN

MECP2 Duplication Syndrome: A Case Study in Childhood Seizures

Katie MacLeay and Jay Riley Argue; Mentor Dr. Naqvi

MECP2 Duplication Syndrome is characterized by duplications or triplication of the MECP2 gene, causing severe to profound intellectual disability in males. Females with this duplication are often asymptomatic or have very mild cognitive impairment. This syndrome, in addition to intellectual disability, is associated with infantile hypotonia, autism, poor speech development, recurrent infections, especially respiratory infections, neurological symptoms such as epilepsy or seizures, progressive spasticity, gastrointestinal motility problems, and even developmental regression in some cases. While most of the cases are inherited, with 100% penetrance in affected males, some de novo cases have been reported. Those males affected often have structural brain anomalies and a distinct facial dysmorphism. Feeding difficulties are often evident within the first few weeks of life due to the hypotonia leading to difficulty swallowing. This in turn also leads to comorbidities including gastro-esophageal reflux, failure-to thrive, and extensive drooling resulting in the need for nasogastric tube feedings. Up to 70% of affected individuals suffer from recurrent respiratory infections, while some also endure meningitis and urinary tract infections. The recurrent infections are thought to lead to further decline in the patient's neurological function and overall status, even leading to death.

We present a case study into the types of seizures patients with this syndrome can present with. Patients affected with this syndrome typically have neurological symptoms such as epilepsy or seizures, and our patient fits this picture. Our patient is a 3 year old male who presented with recurrent tonic seizures and other typical sequelae of MECP Duplication Syndrome.

School: School of Medicine | Campus: Amarillo

MS3-4 MUYSSON, MARCELLA

Newborn care among refugee populations: a study of the influence of cultural background in West Texas

Marcella Muiysson, Alan Gonzalez, Alyssa Byrd, Mubariz Naqvi MD

As health care providers, our cultural competency is challenged daily. In the community of Amarillo, TX, for every 100,000 local residents, there are about 254 refugees. The goal of this study is to learn more about newborn care traditions between these refugee groups when compared to the local native population in order to increase our awareness and ability to provide adequate health care.

Data was collected via surveys distributed among mothers of newborns in the postpartum unit of Northwest Texas Hospital (NORTH TEXAS HOSPITAL).

MS3-4 NGUYEN, THINH

Von Hippel-Lindau with early onset of hemangioblastoma and multiple drop-metastases like spinal lesions: A case report

Thinh H. Nguyen, PhD; Teresia Pham, MD; Thea Strickland, MD, MPH; Daniel Brewer, DO; Muhittin Belirgen, MD; and Mohamad M. Al-Rahawan, MD, MPH

Background: Hemangioblastoma is a rare tumor of the central nervous system (CNS), usually observed in patients with von-Hippel-Lindau (VHL). The peak age for hemangioblastoma is 20 to 50 years of age. Surgical resection of hemangioblastoma is considered the standard of care but Everolimus, an mTOR inhibitor, was shown to be effective in a patient with VHL and multiple organ involvement. Objective: We present our 3-year experience of a female with a rare VHL mutation (c.337C>T) who was diagnosed with multifocal CNS and retinal hemangioblastomas at a young age. Case presentation: At 17-years of age, our patient presented with obstructive hydrocephalus due to a large cystic cerebellar mass. Imaging showed multiple lesions resembling drop metastases throughout her spinal cord. Pathological confirmation of hemangioblastoma on a cerebellar biopsy triggered testing for and diagnosing VHL. Subsequent multi-stage resection of her primary and drop-metastases like disease was done. Six months later she presented with retinal hemangioblastoma while her other lesions were stable. After failing to follow for two years, she presented with multiple new brain, spine and retinal hemangioblastomas. Abdominal MRI showed a 14-mm enhancing nodule in the left lobe of her liver and multiple cystic lesions involving her pancreas. Surgical management of her extensive disease was deemed too risky. Results: Our patient had a rare VHL mutation and very aggressive disease. Surgical management was not feasible, but her systemic disease stabilized while on Everolimus for seven months. She had no toxicity; however, she developed new retinal lesions warranting ophthalmic cryotherapy. Conclusion: Our patient had multiple drop-metastases like spinal lesions, which has been reported in the literature to be associated with hemangioblastoma. Her disease was very aggressive, and Everolimus stabilized it except in her eyes. More research on genotype/phenotype association is needed in VHL.

School: School of Medicine | Campus: Lubbock

MS3-4 OPOKU, AKWASI

Re-expansion pulmonary edema - a rare but fatal complication of thoracentesis

Akwasi Opoku BA, Kenneth Iwuji MD, John Fisher MBA, Brady Holstead MS

Re-expansion pulmonary edema (RPE) is a type of pulmonary edema that typically occurs unilaterally after re-expansion of a chronically collapsed lung. Rarely, it may develop soon after the removal of large volumes of pleural fluid. The clinical presentation ranges from asymptomatic, isolated radiographic changes to complete cardiopulmonary collapse. The exact pathophysiological mechanism is complex and still not completely understood. To avoid complications and mortality, early detection, diagnosis, and subsequent treatment are crucial.

School: School of Medicine | Campus: Lubbock



MS3-4 PHAM, THEOPHILUS

Surgeons Maintained Focus Working 12-Hour In-House Shifts While Experienced Severe Decline in Focus Working 24-Hour In-House Calls

Yana Puckett, MD; Theophilus Pham, MBA; Beatrice Caballero, MS; Karen Castaneda, BS; Benedicto Baronia, MD; Sharmila Dissanaiké, MD; Robyn E. Richmond, MD; Catherine A. Ronaghan, MD

Introduction: Visual eye-tracking is a research tool that records eye movement and can provide a dynamic measurement of a surgeon's visual attention and focus. Little research exists on the impact of 24-hour in-house call on the surgeons. Chronic fatigue is a risk factor for burnout.

Physician burnout reaching epidemic proportions among physicians in the United States. 24-hour in-house call may be a risk factor for fatigue and physician burnout. Frequent 24-hour in-house call likely has a significant impact on surgeon well-being.

Methods: A prospective quality improvement project was performed on surgical residents and attending physicians (APs) working at a busy tertiary referral safety-net hospital with Level 1 trauma and burn centers. A visual tracking system was used to measure visual attention before and after a 12-hour in-house shift and a 24-hour surgical in-house call. Classification of the test results ranged from 0-6: Severely Impaired- 0, Superior - 6

Results: 21 surgeons provided a total of 61 visual tracking tests for analysis. Study population was 46% men, with a median age of 31 years IQR (28-33).

Residents accounted for 48 tests, medical students for 2 tests, and attending surgeons for 11. Average hours of sleep reported before the shift/call was 6 IQR (6-7). There was almost no overall change in focus in individuals before and after a 12-hour in-house shift -0.06 (SD 1.9) Focus dropped by almost two full grades -1.8 (SD 1.6) after 24-hour in-house call ($p=0.013$). No significant difference was found in focus and attention scores between 12-hour day shift and 12-hour night shift. There was no significant difference in focus between male and female surgeons. There was no significant difference in focus between PGY level and attendings.

Conclusions: 12-hour shifts, whether during the day or overnight, may preserve visual focus in surgeons compared with 24-hour in-house calls.

School: School of Medicine | Campus: Covenant

MS3-4 PILLUTLA, PRANATI

Intrathyroidal Parathyroid Carcinoma: A Case Report and Comprehensive Literature Review

Pranati Pillutla, BS; Cynthia Schwartz, MD; Tam Nguyen, MD

Introduction: Intrathyroidal parathyroid carcinoma is a rare presentation of parathyroid malignancy. While it may be asymptomatic, it often presents with signs of hypercalcemia, including gastrointestinal disturbances and recurrent nephrolithiasis.

Case Details: A 31-year-old man with a past history of hyperparathyroidism managed with subtotal thyroidectomy and subtotal parathyroidectomy was noted to have persistent hypercalcemia and elevated parathyroid hormone. There was abnormal radiotracer uptake in the left thyroid gland. Neck exploration with left parathyroidectomy and revision thyroidectomy was performed. A candidate left inferior parathyroid was found within the remnant of the left thyroid lobe, and was identified as parathyroid carcinoma. Immunostains found an intrathyroidal parathyroid carcinoma with lymphatic space invasion. After surgery, his calcium and parathyroid hormone levels normalized.

Review: A systematic review of the literature identified 19 cases. 20 cases were analyzed, including our report. The average presenting age was 48 years (Range: 14-76). 65% (95% CI 43-82%) of patients were female. Intrathyroidal parathyroid carcinomas were found on the right lobe of the thyroid in 55% (95% CI 34-74%) of cases. The majority of these types of carcinomas occur in the inferior aspect of the thyroid (95% CI 53-89%). Of the reported cases, only one was associated with a MEN syndrome.

Conclusions: Intrathyroidal parathyroid carcinoma is a rare and challenging diagnosis due to similarities with more common endocrine abnormalities. Correct diagnosis requires high clinical suspicion and specialized stains. This review suggests that intrathyroidal parathyroid carcinoma is more common in the inferior parathyroids than the superior parathyroids. An inferior intrathyroidal lesion presenting with hypercalcemia may raise suspicion for intrathyroidal parathyroid carcinoma.

School: School of Medicine | Campus: Permian Basin

ABSTRACTS

MS3-4 RITTMANN, RANDALL

Case Report: Peptic Ulcer Disease Disguised as Acute Cholecystitis

Randall Rittmann MS3, Rebecca Brady MS4, David Carlsen-Landy MS3, Max Schimelpfenig MS3, Dr. Muhammad Nazim

Case PTm [(MS3-4 Rnnig)/pelvisfely use suciy.v2 TD4i255.25.470827 0 TD 0 Tw (p)Tj /TT16 1 Tf .2781 0 T* -.0288 Tw [(5)66.

MS3-4 ROSALES, ABIGAIL

Laparoscopic Removal of a Primary Retroperitoneal Mucinous Cystadenoma: A Case Report

Allison Gracey BS BA; John Lung BS; Abigail Rosales MBA; Eva Bashover MD, FCAP; Muhammad Harris Nazim MD, FACS; Ferdinand Rico MD, FACS

Background: Primary retroperitoneal mucinous cysts are rare occurrences and benign mucinous cystadenomas are the rarer type. Case reports of mucinous cystadenoma with an origin from the mesentery are very rare with 19 cases reported. We present a case report about an innovative laparoscopic removal of a retroperitoneal mucinous cystic neoplasm.

Objective: To review the literature and present a case report of a laparoscopic removal of a retroperitoneal mucinous cystic neoplasm.

Methods: A 22-year-old female who presented with a two day history of bloating, mid-epigastric pain, and nausea without vomiting. A CT scan of her abdomen/pelvis showed a large possible mesenteric cyst. The surgical plan was for a laparoscopic excision with possible bowel resection. During the surgery the mass was observed to be retroperitoneal in nature, abutting the left colon. The cyst was successfully excised and placed within a surgical bag. It was then aspirated within the surgical bag and delivered out of the body.

Results: The final pathology report revealed a benign mucinous cystic neoplasm mesenteric in origin that was located in the retroperitoneum. Postoperatively, the patient was placed on the surgical ward where she progressed well and was discharged the following day.

Conclusion: Primary retroperitoneal mucinous cystic neoplasms rarely occur. Although there had been previous caution in using a laparoscopic approach due to potential seeding intraoperatively, we have shown through our case that it is possible to safely and safely use such an approach.

School: School of Medicine | Campus: Amarillo

MS3-4 SAA, LISA

Popliteal Artery Entrapment Syndrome: Clinical Pearls

Lisa Saa, Peter K. Firouzbakht, Mohammad Otahbachi

Popliteal artery entrapment syndrome (PAES) is an uncommon cause of lower extremity claudication that is often overlooked as a possible differential diagnosis by healthcare providers. PAES most commonly presents in young men without risk factors for atherosclerotic disease. Dorsiflexion and plantar flexion can be performed during the physical exam of the initial visit if PAES is suspected. Angiography can then be used to diagnose PAES. Surgery provides definitive treatment in most cases. It is important to maintain a high clinical suspicion of PAES when those with claudication and without atherosclerotic risk factors present to the clinic in order to prevent negative outcomes, including limb ischemia requiring amputation. Here we aim to highlight the clinical presentation, classification,

MS3-4 TELLO, NADIA

Intentional Foreign Body ingestion: An Unusual Case of Hypopharyngeal Foreign Body Missed on CT

Nadia Tello, BS, MBA, Pranati Pillutla, BS, Rahul Varman, MD, Joshua Demke, MD

Intentional foreign body (FB) ingestion in adults is rare. Small FBs commonly lodge in the cervical esophagus and are generally detected on soft tissue neck exams. We present an unusual FB ingestion leading to posterior pharyngeal perforations, requiring endoscopic

MS3-4 WILLMS, JOSHUA

Development of a premedical student volunteering/mentorship program designed to address the economic problem of the caregiver-patient ratio in skilled-care geriatric memory units

Willms J, Brown S, Chavez A, Zon A, Moseley K, Perez A, Wolpert J, Young K, Culberson J

MS3-4 YOUNES, LENA

Vulvar Leiomyoma, a case of a rare genital tumor

Lena Younes MSIII, Hena Tewari MD

Introduction: Leiomyomas are benign monoclonal tumors that arise from smooth muscle cells. Uterine leiomyomas the most common benign tumor in women, with a prevalence of 60-80% by the age of 50. Although extra-uterine leiomyomas are quite rare, vulvar leiomyomas are in fact the most common benign solid tumor of the vulva. The relative rarity and presentation as a painless solid mass may lead to a misdiagnosis of a Bartholin cyst.

Case Report: A 74-year-old postmenopausal obese female presented with a left labial mass. The mass was present for the last 10 years but was progressively enlarging in the last three months. She denied any symptoms of pain, discharge, bleeding. She denied any difficulty urinating or walking. The mass was lanced in the past year but did not resolve. On exam, there was vaginal atrophy and a left labial swelling measuring 10x8 cm. The mass was cystic and mobile. Incision and drainage of the mass was performed. Pathology of the specimen revealed a 3.5x2.5x1.7 cm tan-gray, rubbery, and homogenous tissue suggestive of a leiomyoma of the vulva; the report was also negative for malignancy.

Discussion: Leiomyoma arising within the external female genitalia are rare and often confused for other diagnoses such as Bartholin cysts. The presentation of these tumors can be difficult to distinguish from malignant tumors, and factors such as diameter, margins, and cellular atypia can suggest an atypical leiomyoma or leiomyosarcoma. Excisional biopsy is the most reliable way to establish the correct diagnosis, but in some cases, ultrasound and MRI can be used to help characterize the growth. Wide excision of the mass is the treatment of choice and has been shown to have low recurrence rates.

Conclusion: Although not prevalent in the literature, vulvar leiomyoma should be considered in the differential diagnosis in a patient presenting with a genital mass.

School: School of Medicine | Campus: Amarillo

MS3-4 ZHAO-FLEMING, HANNAH

Creutzfeldt-Jakob disease presenting with recurrent falls, visual hallucinations, and altered mental status.

Hannah Zhao-Fleming Ph.D.*, Dominique Gagnon Ph.D.*, and Byungkwan Hwang M.D.

*co-Prst authors

Creutzfeldt-Jakob disease (CJD) is a rapidly progressive disease presenting with dementia, motor dysfunction, and myoclonic movements. Our patient was a 63-year-old Caucasian male inmate presenting with recurrent falls, visual hallucinations, and auditory and visual hallucinations. His past medical/surgical history was significant for adenocarcinoma of the lung, status post (s/p) lobectomy, bilateral cataracts, s/p removal, and right subdural hematoma. Physical exam was challenging due to his agitated and confused sensorium and his physical restraints. Exam was notable for bilateral low light reflex, blurriness from left eye, no vision in the right, urinary incontinence, and muscle weakness noted by the Montfort physician. On admission to our current hospital, our patient had a normal neurologic exam including intact cranial nerves II-XII. On hospital day 3, he developed abnormal bilateral movement of his upper extremities and fasciculations. Neurology, Infectious Disease, Psychiatry, Cardiology, and Ophthalmology were consulted. The differential diagnoses were encephalopathy (Wernicke's, metabolic, and viral), metastatic stroke, and epilepsy. Numerous studies were obtained by the different teams at different time points; his tests were negative for cardiac arrhythmias, carotid stenosis, valvopathy, drugs of abuse, sexually transmitted diseases, infectious viral panel, and heavy metals. Magnetic resonance imaging (MRI) showed small lesions of the cerebellum consistent with metastasis or stroke and overall picture suggesting hypoxic injury. Electroencephalogram (EEG) was consistent with non-specific cerebral dysfunction and no seizures were noted. Cerebrospinal fluid (CSF) analysis showed presence of coccidioidomycosis, as well as a higher than normal level of protein 14-3-3, which was received postmortem. Retrospectively, clinical presentation, MRI, EEG, and CSF findings were consistent with CJD.

School: School of Medicine | Campus: Lubbock

SCHOOL OF NURSING

NURSE CASTLE, LAURA & HIGGS, AMBER

Inhaled Corticosteroids Use in Pregnancy

School: School of Nursing

NURSE DUFFY, MELISSA & EARLE, BRYAN

Post Concussion Recovery In Adolescents – Is Rest The Best Recommendation?

School: School of Nursing

NURSE EDWARDS, ALISA & BRIONES, JESSICA

Concussion Management in Adolescents

School: School of Nursing

NURSE BROWN, DINA

A Comparison of Attention Deficit-Hyperactive Disorder (ADHD) Interventions in Children Ages 6-12

School: School of Nursing

NURSE GUERRA, LISA & FINLEY, GESSICA

CAUTION!! Are you at risk for alert fatigue?

School: School of Nursing

NURSE DILLARD, DE VONN & THOMPSON, CATHERINE

Healing the Silent Victims: TF-CBT for Children of Incarcerated Parents

School: School of Nursing

NURSE HOBBS, STACY; STRAKER, MONIQUE & URBAN, LINDSAY

Trauma Focused Screening and CBT with Adolescents Living with HIV in Swaziland: A Student Perspective

School: School of Nursing

R&CF BOKAIE, HASSAN

Resource Utilization And Acute Management For Children Presenting To The Emergency Department (Ed) With Abdominal Pain

Hassan Bokaie, Lara Johnson

Abdominal pain is a common presenting complaint to the ED for children. Variation exists in both diagnostic and treatment approaches.

Objective: We sought to characterize resource utilization and patient management approaches in a representative sample of pediatric patients presenting to the emergency department with a chief complaint of abdominal pain.

Methods: We utilized the National Hospital Ambulatory Medical Care Survey emergency department sample from 2005-2015. We defined our population as having a reason for visit of abdominal pain or appendicitis with no indication of trauma or injury. Key



R&CF JIN, DONGKWAN

Predicting Necessity of ICU Care for Acute Ischemic Stroke.

Dongkwan Jin, MD, Yazan J Alderazi, MD, Smathorn Thakolwiboon, MD, Walter Duarte-Celada, MD

Background and Purpose: With continuous rise in medical expense for stroke, there is a growing need for a strategy to safely triage patients with stroke among different levels of care. We studied on clinical variables to identify characteristics which could be used to predict severity requiring high level of management in intensive care unit.

Methods: We retrospectively characterized consecutive patients who presented with acute ischemic stroke to a single comprehensive stroke center. 130 patients who were admitted within 2 days of stroke symptoms were enrolled for the study. Retrospective

R&CF JOGINPALLI, SHARANYA

ANCA Associated Vasculitis Following Hematopoietic Stem Cell Transplantation

Dr. Sharanya Joginpalli, Dr. John Pixley

A 16 year old male who underwent a donor-related (brother) hematopoietic stem cell transplant for aplastic anemia due to paroxysmal nocturnal hemoglobinuria > 1 year prior was transferred to our children's hospital for new-onset fever, chills, cough, dyspnea on exertion and hemoptysis. Prior treatment for community acquired pneumonia was not effective. Initial laboratory analysis revealed a normal complete blood count and differential, elevated C-reactive protein (CRP) and elevated procalcitonin. Urinalysis was normal. Imaging revealed bilateral pulmonary infiltrates. Broad-spectrum antibiotics and anti-fungal agents were not effective. Studies to identify viral, bacterial, disseminated fungal, and mycobacterial infections were negative. Patient continued to deteriorate clinically requiring supplemental oxygen. High dose steroid therapy was initiated on hospital day 6. The patient rapidly improved the second day of steroid administration. Due to positive response to steroids, rheumatologic studies were performed. Anti-myeloperoxidase antibody was positive at high titer while anti-proteinase 3, anti-glomerular basement membrane, anti-nuclear antibody and rheumatoid factor were negative. Sinus imaging demonstrated ethmoid, sphenoid and maxillary sinus mucosal thickening and fluid. Upon further history, mother noted a cousin who died of Wegener's disease. Recent chimerism analysis revealed >98% donor engraftment. Animal models of organ specific and systemic autoimmunity are transferable by bone marrow transplantation. We have identified two reports of ANCA associated vasculitis, one following an autologous and the other following allogeneic bone marrow transplantation. This and the positive family history leaves open the possibility that susceptibility to ANCA associated vasculitis rests in the hematopoietic stem cell.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF LEACH, CHRISTOPHER

An Unusual Cause of Neck Pain in a Cross Athlete

Naticia Mortensen MD; Christopher Leach MD; David Edwards MD, Keeley Hobart MD

History: A 32 year old healthy Cross athlete presented with a 3 day history of neck pain of moderate severity. He denied recent injury. The pain was non-radiating and accompanied by nausea and diffuse headache. He sought evaluation in our hospital's emergency department. We were called to evaluate him for hospital admission. ROS was significant for photophobia and body aches. He had no chronic medical conditions. Family history was non-contributory.

Physical Exam: Tmax 102.2 - BP 131/76 mm Hg, HR 84 beats/min, RR 16 breaths/min, 97% on room air, BMI 31

He was in moderate distress due to neck pain. HEENT exam showed no trauma, MMM, EOMI, and PEERLA. The neck was rigid without tenderness. He had TTP of the paracervical muscles and bilateral upper trapezius muscles. No rashes. Neurologic exam intact CN II-XII, no focal weakness, no sensory deficits, and negative Brudzinski's and Kernig's signs.

Differential Diagnoses: 1. Meningitis; 2. Subarachnoid hemorrhage; 3. Encephalitis

Tests and Results: CBC: WBC 11.7; RapidFlu test negative; CMP/lactate were unremarkable; Head CT: WNL; CSF: clear, WBC 225 (63% lymphs), RBC 10, glucose 55 mg/dl, protein elevated at 113 mg/dl. CSF culture negative. CSF PCR panel negative. CSF + West Nile IgM 4.84 (> 1.10 is +, neg for IgG).

Final Dx: Meningitis due to West Nile Virus

Discussion: Patient started on treatment with vancomycin, ceftriaxone, and acyclovir. He had improvement in nuchal rigidity and resolution of headache. Upon 48 hours of negative cultures, he was discharged to complete a 14 day course of acyclovir. The Cou Health Department was notified of West Nile Virus meningitis. Presence of West Nile Virus IgM in the CSF suggests infection since it does not cross the blood-brain barrier easily.

Experts estimate that only about 1% of West Nile disease presents with neurologic signs. Neuro-invasive disease carries a 9-15% mortality with up to 35% in the elderly

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF LOYA VALENCIA, CARLOS

When You Can't Just Walk It Off

Carlos Loya-Valencia, MD, Almond Toledo, DO, Jennifer Mitchell, MD; Jeff Paxton, MD, Cyrus Caroom, MD

20-year-old college male soccer athlete with acute right ankle pain after landing from a header while defending a corner kick during a soccer match. The pain was associated with an audible cracking sound leading to obvious ankle deformity. Initial assessment revealed a right anterior-lateral ankle dislocation with concern for decreased perfusion as evidenced by sluggish capillary refill. Sideline reduction techniques were performed with restoration of brisk capillary refill and evidence of preserved sensation and motor function. After closed reduction, the patient was splinted and transferred to a nearby Emergency Center. Imaging revealed an acute lateral and posterior malleolus fracture with evidence of syndesmosis widening. Furthermore, anterior subluxation was reduced under fluoroscopic guidance to an anatomical position. Surgical intervention was delayed allowing for edema to improve. Following an open reduction with internal fixation of the lateral malleolus, external rotational stress was applied which was noteworthy for persistent syndesmosis widening. For this reason, the posterior malleolus was fixed with screws in order to stabilize the posterior inferior tibiotalar ligament and restore syndesmosis stability.

The case of this 20-year-old male soccer athlete with a right ankle bi-malleolar fracture with syndesmosis instability serves as a demonstration of the importance of sideline medical management and provides evidence for an alternative procedure to provide syndesmosis stability. Traditionally, syndesmosis instability requires fixation with position screws or a suture button if there is tibiotalar diastasis, a Maisonneuve fracture or persistent syndesmosis disruption after closed reduction. However, in this Weber B3 injury, stability of the syndesmosis was successfully achieved with fixation of the posterior malleolus in order to support the posterior inferior tibiotalar ligament.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

ABSTRACTS

R&CF LU, HO-CHENG

Fatigue alters coordination variability during the Wingate Trials

HoCheng Lu, Josh Gills, Braden Romer, C. Roger James, and David Szymanski

INTRODUCTION: Neuromuscular fatigue is a risk factor for acute musculoskeletal injury. The effects of central and peripheral fatigue on motor coordination have been explored during prolonged locomotion. However, only a few studies have focused on the effects of fatigue induced by a short, high intensity exercise. **PURPOSE:** The purpose was to examine the effect of peripheral fatigue on coordination variability during the execution of a Wingate Test (WT) in men. **METHODS:** Twenty-three health male (height = 175.5 ± 7.4 cm, body mass = 76.4 ± 11.4 kg and VO_2 peak = 55.4 ± 9.0 ml \cdot min $^{-1}$) voluntarily participated in this study. Subjects completed VO_2 peak in the first session. After one-week recovery, subjects returned to complete the WT, which involved pedaling as fast as possible for 30 seconds. Two-dimensional sagittal plane kinematics were collected using motion capture camera recording at 120 Hz. A custom MATLAB program was utilized to calculate continuous relative phase (CRP) ratio representing inter-segment coordination. Sagittal plane segment angles and velocities were calculated to determine CRP mean and deviation phase (DP) of the thigh-shank and shank-foot. WT duration was divided into thirds as follows: Part 1: 0-10 seconds, Part 2: 10.1-20 seconds, and Part 3: 20.1-30 seconds. One-way repeated measures ANOVA was used to examine differences in CRP mean and DP across temporal parts. **RESULTS:** A significant difference in the shank-foot CRP mean was observed between Part 1 (-40.85 ± 12.58) and Part 2 (-45.99 ± 9.51). A significant difference in the shank-foot DP was observed between Part 3 (24.39 ± 4.39) and Parts 1 (21.40 ± 3.84) and 2 (21.32 ± 3.73). **CONCLUSION:** During high intensity cycling to fatigue, subjects showed significant alterations in coordination between the shank and foot. Altered coordination could indicate a greater demand on the hip and knee extensors, and result in increased injury risk.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SCHWARTZ, CYNTHIA

A Novel Repair Method of Temporal Bone Encephalocele with Cerebrospinal Fluid Leak and Review of Literature

Cynthia Schwartz, MD, Pranati Pillutla, BS

Objective: To present a case of temporal bone encephalocele with cerebrospinal (CSF) leak, demonstrate a novel repair method, and perform a literature review of repair techniques.

Patient: A 55 year old female presented with complaints of recurrent ear infections, aural fullness, and hearing loss. Her past history included right canal wall up mastoidectomy and tympanoplasty and sinus surgery. A CT of the right ear showed significant tegmen tympani defects, suspicious for CSF leak. Upon operation, a right temporal lobe herniation into the mastoid cavity was noted, which was amputated. A cortical mastoid base and two cartilage grafts were harvested and layered into the 7 mm by 2.5 cm defect. Norian Drillable (DePuy Synthes, Raynham, MA, USA) bone glue was used as sealant. No leak was found upon inspection.

Results: Our patient has no evidence of CSF leak to date. The transcranial approach, transmastoid approach, or a combination are the most commonly described procedures to treat temporal bone encephalocele with CSF leak.

Conclusions: Using bone glue, temporal lobe herniation and large CSF leak were resolved by a transmastoid approach. A MCF approach requiring cranioplasty, a surgery often needing placement of a lumbar drain, prolonged hospitalization, and the risks brain retraction, was avoided. This case report, containing a novel use of bone glue, suggests that patients with defects up to 2.5 cm may be able to avoid the MCF approach.

Level of Evidence - LEVEL V - Case study with no controls

IRB: Exempt

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SECKEL, SHANNON

R&CF SONG, ELISA

How to Improve Medication Administration Sheet

Elisa Song, MD ; Michelle Tarbox MD

Texas Tech Dermatology Clinic is a busy outpatient clinic in which thousands of patients are seen each year. Many procedures are done in the outpatient setting - such as intralesional kenalog (ILK) or candidin injection (immunotherapy)- on a daily basis. In order to perform the appropriate procedure - the medication being administered has to be matched to a diagnosis, using the ICD-10 system. In the past- frequent errors were created as the diagnosis code had to be individually looked up each time. A new and improved medication administration sheet was created where the most commonly used ICD-10 codes, along with frequently performed procedures- were all displayed on one sheet, in which the physician simply has to circle the diagnosis from a list. After this intervention- based on a post-intervention survey that was administered to both the physicians and other medical staff- it became clear that this method of medication administration facilitated and simplified the process. This new sheet has been used the dermatology for

R&CF TOLEDO, ALMOND

No Contact, Yet Two Surgeries?

AR Toledo DO, J Mitchell MD, M Phy DO and K Crawford MD

History: A 23-year-old college football player sustained a non-contact right knee injury during an outdoor team scrimmage. He attempted to pivot and change direction with his right foot planted on a natural grass field when he felt a pop with associated pain. Medical staff noted a knee deformity with a posterolateral translation of the tibia. Had weak distal pulses to the compared contralateral extremity. Pulses returned to normal with successful reduction of the joint. He was placed in a knee immobilizer and transported to the hospital for further evaluation.

On-Field Physical Exam: General: In considerable amount of pain; Musculoskeletal: Grossly deformed right knee with circumferential swelling; Vascular: Faint distal pulses; Physical Exam Status-post EMS Transport to ED; Vitals: BP: 151/96, HR: 88, RR: 18
General: Pain well controlled with narcotics; Cardiovascular: Normal distal pulses

Musculoskeletal: Right Knee - Skin intact. TTP along the lateral and medial joint line. Proximal tibia nontender to palpation. All compartments throughout the right lower extremity soft. Able to dorsiflex and plantar flex.

R&CF WARD, JENNIFER

Inter-professional Education in Long Term Care Setting

Jennifer D Ward, MD; John Culberson, MD; Rebecca Sleeper, PharmD

Background: Collaboration among medical professions is essential when caring for elderly patients in long term care. Without this approach, care is severely fragmented and unable to address the needs of individual patients. While efforts to stimulate in medical training, inter-professional education allow for the mimicking of this collaboration as students and residents learn to work for patients in a controlled environment (Solberg 2015). However, most medical learners have not had the opportunity to interact with other healthcare professions (Montagnini 2014). To address this de

SHP CHEN, YO-RENG

Does Movement Strategy Change Y Balance Test Performance Variability? - A Pilot Study

Chen YC, Munger L, Hooper T, James R



SHP KAPILA, JEEGISHA

Intra-rater Reliability of Infraspinatus and Posterior Glenohumeral Capsule Shear wave Elasticity Measurement During Sustained Posterior Glide Mobilization.

Kapila, J, James, CR, Briscoe JM, Gilbert KK, Hooper, TL

Background: Posterior shoulder joint capsule and infraspinatus stiffness are hypothesized causes of decreased mobility and function. Manual therapy may improve shoulder capsule flexibility by decreasing capsuloligamentous stiffness.

Purpose: The purpose of this study was to investigate the intra-rater reliability of shear wave elastography (SWE) of posterior der capsule and infraspinatus elasticity measurements and humeral head position during a sustained posterior glide mobilization.

Methods: Eight subjects [4 Male & 4 Female; BMI= 25.7 (4.2)] aged 30-47 years (36.6) were recruited to establish intra-rater reliability of SWE elasticity measurements and humeral head position (ICC3,3). They were positioned in supine with the shoulder abducted to 45 degrees. An investigator applied sustained posterior gliding mobilization force (90 N) to the anterior shoulder 30 seconds using a hand-held dynamometer. A second investigator placed a 10-2 MHz linear ultrasound transducer on the posterior shoulder to evaluate humeral head displacement, infraspinatus tendon, and posterior capsule SWE elasticity measures before and during each mobilization.

Results: The ICC values for posterior capsule SWE elasticity at rest and during sustained posterior glide mobilization were 0.7

SHP LIU, YILAN

Acoustic Analysis of Vowel Nasalization for Mandarin and English speakers

Yilan Liu, MA; James Dembowski, PhD, CCC-SLP

“Nasality” refers to nasal resonance in speech production. Variations in nasal resonance may characterize special populations, as people with hearing loss and cleft palate, but may also be language differences. Nasal resonance may be estimated from specialized equipment (a nasometer) or from a standard acoustic signal. A pilot study found Mandarin speakers produced higher nasometer values (“nasalance”) than native English speakers on selected speech samples, but whether these values were evident in the acoustic signal was not explored. This project aims to compare nasalance scores to acoustic measures of nasality in Mandarin and English speakers. Acoustic measures are based on comparisons of the amplitude of the first formant (sometimes labeled A1) with harmonics thought to be nasal resonance (usually labeled P0 and P1). The expectation is that acoustic values based on A1-P0/P1 differences, together with nasalance scores, will provide evidence of higher vowel nasalization in Mandarin speakers than English speakers.

School: School of Health Professions | Campus: Lubbock

SHP MURPHY, BRANDI

Graph Area Activations: An Investigation Using fMRI Techniques

Brandi Murphy, Eric Walden, Jiang Hu, Weihong Ning, & Nakul Padalkar

Graphs are strategic visual representations that offer meaning in various ways. Within the healthcare industry, graphs may be used to display information regarding patient health states. An author from Palapa Consulting Affiliates. Graph by iStockphoto.com

SHP NICHOLS, CHARLES

Glenohumeral Joint Capsule Tissue Under Tension Loading Correlates Highly with Shear Wave Elastography: A Cadaveric Investigation

Nichols Jr CW, Brismée JM, Hooper TL, Bertrand-Grenier A, Gilbert KK, Sobczak S

Background: Joint capsular tissue restrictions result in joint range of motion (ROM) limitations. The effects of joint immobilization and tension loading on capsular tissue remain unknown. Ultrasound shear wave elastography (USWE) has been used in vivo to measure stiffness in organs, tendons, and muscle. However, no study has investigated the reliability and validity of USWE readings in measuring capsular tissue property changes against a reference standard.

Objectives: To investigate capsular tissue mechanical property changes using USWE and a durometer, a device validated to measure tissue hardness, under various tensile loads and determine USWE and durometer measurement reliability and correlation of USWE with durometer measurements.

Methods: The inferior glenohumeral joint (GHJ) capsule was harvested from 10 fresh human cadaveric specimens. Tensile loading was applied to the capsular tissue using one, three, and eight-kilogram (kg) weights with measurements taken during loading with USWE and a Shore A durometer.

Statistical Analysis: Descriptive statistics were calculated. The Shapiro-Wilk was performed to assess data normality. Reliability was established for the USWE and durometer using intraclass correlation coefficients (ICC3,5). A Pearson Product-Moment Correlation assessed the association of USWE with a durometer.

Results: Reliability for the durometer measurements was 0.90 (95% CI 0.79-0.96) and for USWE was 0.95 (95% CI 0.88-0.99) respectively with a Pearson Correlation Coefficient of 0.62 (CI 0.25-0.86) to measure tissue tension loading properties.

Conclusion: Both the durometer and USWE measurements were highly reliable and correlated moderately for measuring GHJ capsule elasticity. These results suggest that SWE can be used to assess joint capsule tissue properties changes during tension loading.

School: School of Health Professions | Campus: Lubbock

UNDERGRADUATE

UNDG AFTABI, ALI

A Comparison Between Past, Present, and Future Treatments Against Poly-Microbial Chronic Wound-Associated Biofilms

Ali Aftabi, Whitney K. Redman, Angel R. Cueva, Kendra P. Rumbaugh

Chronic wounds have a high potential to become infected with pathogenic bacteria, that frequently leads to the development of biofilms. Biofilms are communities of bacteria that secrete an extracellular polymeric substance (EPS). *Pseudomonas aeruginosa* (PA01) and *Staphylococcus aureus* (SA31) are two virulent microorganisms that are frequently found in chronic wounds. Effective treatment of biofilms is a difficult task since the EPS prevents therapeutic agents from reaching the bacteria. The associated bacteria are metabolically inactive, further inhibiting the efficacy of therapeutic agents. Recently, there have been studies to suggest that the use of enzymes that degrade the EPS increases the efficacy of antibiotics. Various herbal-based essential oils have also demonstrated antibacterial properties, although there have been no studies suggesting these oils work against associated bacteria. The aim of this study was to compare past (herbal remedies), present (antibiotics), and future (enzymes) treatments a biofilm-associated bacteria as well as to determine the essential oil with the highest antibacterial activity. In order to replicate wound environment, we implemented an in vitro model previously described as the Lubbock Chronic Wound Like Media (LC-WLM). This wound-like media contained both PA01 and SA31. 48-hour biofilms were treated with either essential oils, antibiotics, or enzymes. Percent dispersal was calculated using colony forming units (CFUs). To determine the essential oil with the highest antibacterial property, the zone of inhibition was calculated against 5 bacterial species. The essential oils worked as well as antibiotics in the LCWLM, while the enzymes dispersed the most bacteria from the biofilms compared to antibiotics and essential oils. Out of the essential oils that were used in this study, Oregano and Cinnamon Bark were found to have the largest zones of inhibition.

School: Texas Tech University

UNDG BRITO, MARITZA

Effects of cycad toxins on the blood-brain barrier function in vitro using a human induced pluripotent stem cell-based model

Martiza Brito¹, Glenn Kisby², Abraham Alahmad¹

Background: Cycads are a gymnosperm plant commonly found in the Northern Pacific Region of the American continent and in Oceania. Cycad seeds have a documented neurotoxicity as such seed contains beta-methylamino-L-alanine (BMAA), cycasin and methylazoxymethanol (MAM). Such compounds are commonly associated with dog poisoning (due to ingestion of cycad seed), yet several studies highlighted a higher incidence of several neurodegenerative diseases (such as ALS and parkinsonism-dementia complex) amongst Chamorro people living in Guam compared to other populations. Yet, the effect of such toxins on the blood-brain barrier (BBB) remains undocumented. In this study, we investigated the toxic effects of cycad toxins on the human BBB function in vitro.
Methods: Two induced pluripotent stem cells (iPSCs) cell lines were used in this study. Such cells were differentiated into brain vascular endothelial cells (BMECs) and neurons using published protocols. Cells were treated with BMAA, cycasin, MAM for 24 hours at concentrations ranging from 10-1000 microM. Barrier function was assessed by measuring changes in transendothelial electrical resistance (TEER) and fluorescein permeability. Barrier integrity was assessed by immunofluorescence, cell metabolic activity was assessed by MTS.
Results: We observed no signs of toxicity in BMECs monolayers for concentrations up to 1000 microM. Although we did not observe decrease in TEER, we noted an increase in fluorescein permeability for BMAA, and in lesser extent for cycasin and MAM. We observed a discrete alteration in tight junction complexes. Notably, glucose uptake was significantly affected by 10⁻⁴ M concentrations. BMEC neuron co-cultures were significantly affected by such treatment.
Conclusion: Our data indicates the presence of possible toxicity of cycad toxins, in particular by affecting the barrier function in BMECs and possibly impairing glucose metabolism and metabolic coupling. We are currently investigating extent of absorption.

School: Texas Tech University

ABSTRACTS

UNDG CRISTY, SHANE

Ammonium sulfate is a potential alternative therapy to treat *Pseudomonas aeruginosa* infections

Shane Cristy and Kelsie Beasley and Abdul Hamood

Severe burns are characterized by the loss of the skin barrier and the concomitant depression of the local and systemic immune responses. Patients with severe burns are susceptible to bacterial infection which leads to sepsis, multi-organ failure, and death. Among the different pathogens that cause sepsis in burn patients is the opportunistic pathogen *Pseudomonas aeruginosa* which is inherently resistant to several antibiotics. The multidrug resistance of *P. aeruginosa* combined with the high cost of producing antibiotics necessitates the search for potential alternative therapies such as compounds that reduce *P. aeruginosa* virulence without inhibiting its growth. Therefore, unlike antibiotics, *P. aeruginosa* mutants resistant to these compounds are unlikely to emerge. One such potential compound is ammonium sulfate $[(NH_4)_2SO_4]$. We hypothesized that $(NH_4)_2SO_4$ could significantly reduce *P. aeruginosa* virulence without affecting its growth. Using suitable enzyme assays, we examined the effect of $(NH_4)_2SO_4$ on the production of LasB, LasA, pyoverdine, and pyocyanin by the virulent *P. aeruginosa* strain PAO1. In addition, using transcriptional fusion analyses, we determined the effect of $(NH_4)_2SO_4$ on the expression of several virulence as well as the virulence related quorum sensing (QS) genes. Results showed that at concentrations of 12.5 mg/ml to 25 mg/ml, $(NH_4)_2SO_4$ had no significant effect on PAO1 growth but significantly reduced the production of LasB, LasA, pyoverdine, and pyocyanin. In addition, $(NH_4)_2SO_4$ significantly reduced the expression of *lasR*, *lasB*, and *rhlR*. $(NH_4)_2SO_4$ also significantly reduced the level of the PQS autoinducer produced by PAO1. These results suggest $(NH_4)_2SO_4$: 1) interferes with *P. aeruginosa* virulence by significantly reducing the production of different virulence factors, and 2) is a potential alternative therapy that may be used, in conjunction with lower doses of antibiotics, to treat *P. aeruginosa* infections.

School: Texas Tech University

UNDG GOMEZ, ANDRE

Bacterial fluorescence imaging detects planktonic bacteria and biofilms in vitro

Andre Gomez, William Little, Andrea J. Lopez, Klara C. Keim, Monique Y. Rennie, Liis Teene, Allie Clinton Smith

Chronic wounds commonly harbor polymicrobial biofilms, and certain combinations of microbes may result in more aggressive infections. Culture-based diagnostics identify dominant microorganisms as well as their antimicrobial susceptibility, however the long lag time to obtain those results (3 days to 4 weeks) significantly impacts wound care and treatment. Bacterial fluorescence imaging with the MolecuLight i:X imaging device uses safe violet light to detect fluorescent properties of bacteria. Many species of bacteria utilize aminolevulinic acid (ALA) to produce porphyrins, which fluoresce red under specific wavelengths of light. The MolecuLight i:X imaging device allows physicians to detect bacterial bioburden in a wound in real time, and can direct specimen sampling to the area with the heaviest bioburden, improving diagnostic capabilities. Prior work demonstrated its detection of bacteria from in vitro and in vitro monomicrobial planktonic cultures. We have investigated its capability to detect bacteria using our polymicrobial in vitro biofilm model, consisting of Bolton's broth and bovine plasma, which is representative of the chronic wound environment. *Staphylococcus aureus*, *Escherichia coli*, and *Enterobacter cloacae* were selected as representative wound pathogens. When grown in an in vitro wound-like model for seven days, followed by the induction of porphyrin production by the addition of ALA for 24 hours, we demonstrated that the device can readily detect bacterial fluorescence from both monomicrobial and polymicrobial biofilms. These data demonstrate that bacterial fluorescence imaging detects porphyrin-positive species of bacteria growing both planktonically and as a biofilm, as well as monomicrobial and polymicrobial communities, which further validates the clinical capability and relevance of the device for use in wound care.

School: Texas Tech University

UNDG KEIM, KLARA

The Clinical Significance of Staphylococcus aureus Small Colony Variants

Klara Keim and Dr. Allie Clinton Smith

A novel phenotype of Staphylococcus aureus (SA) called Staphylococcus aureus Small Colony Variants (SA-SCV) have been identified, principally associated with chronic and recurrent infections. This phenotype is induced spontaneously as a result of a

UNDG LITTLE, WILLIAM

An investigation of *Pseudomonas aeruginosa* cyanofluorescence with the MolecuLight iX bacterial fluorescence imaging device

William Little Andrea J Lopez Andre Gomez Klara C Keim Monique Y Rennie Allie Clinton Smith

Chronic wounds are a current area of major clinical concern, resulting in immense morbidity and mortality of a large patient population annually. These wounds do not typically respond to normal courses of antimicrobial treatment and often require drastic therapies, including amputation of the affected limb. Many different bacterial species are known to cause infections in chronic wounds, with *Pseudomonas aeruginosa* often playing a major role in these wounds, due to its virulence and persistence. MolecuLight developed a bacterial fluorescence imaging device to detect the fluorescent properties of many chronic wound pathogens to aid in real-time visualization and direct specimen sampling. Bacterial species that produce the exoproduct porphyrins will glow red under the MolecuLight i:X device. While *P. aeruginosa* is a known porphyrin producer, this organism typically fluoresces blue-green cyan under the device both in vitro and in vivo. It is thought this is due to the production of additional exoproducts with different properties, such as pyocyanin. We have partnered with MolecuLight to elucidate the mechanism of cyanofluorescence production of *P. aeruginosa* in order to optimize the detection and utilization of the device with *P. aeruginosa*-infected chronic wounds.

UNDG WELCH, GARRETT

Determining the Efficacy of Multi-Enzyme Cocktails to Degrade Biofilms

Garrett S. Welch, Whitney K. Redman, Derek Fleming, Kendra P. Rumbaugh

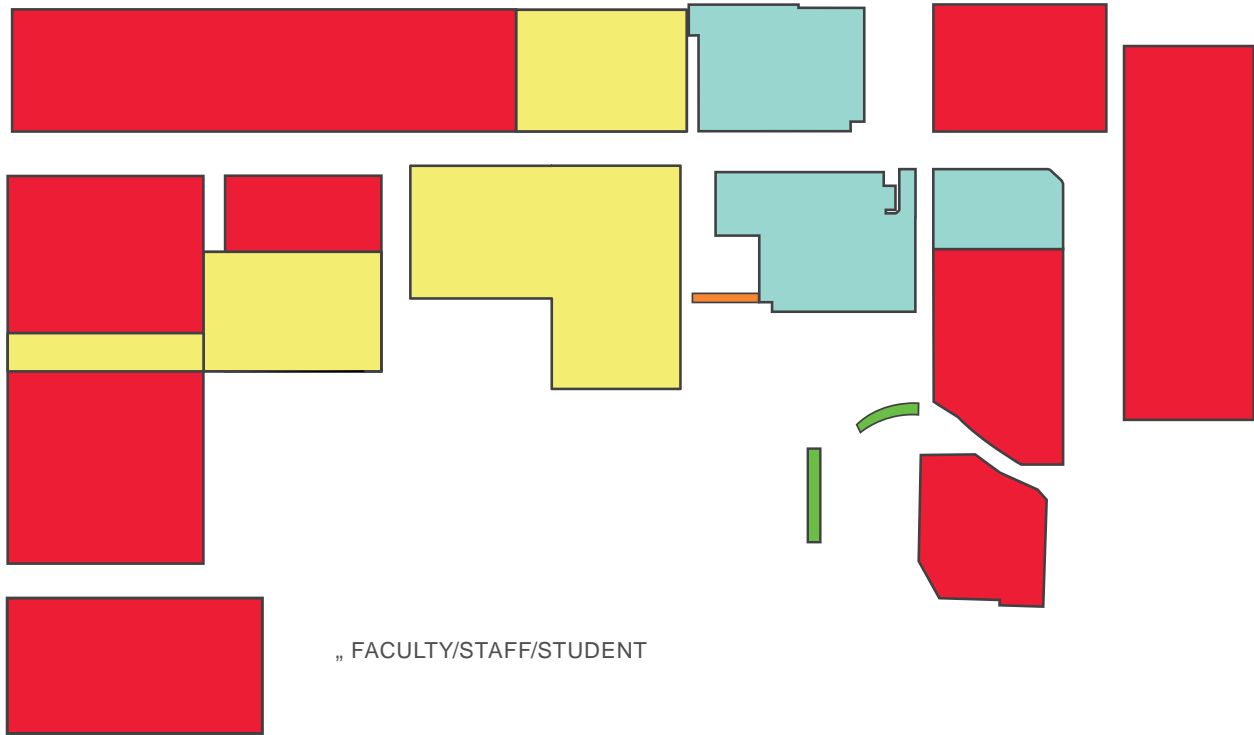
Bacteria in biofilms are more tolerant to antibiotics, antimicrobials, and host immune system defenses when compared to their free-floating, planktonic, counterparts. This increased tolerance has been attributed to the self-synthesized extracellular polymeric substance (EPS), made up primarily of exopolysaccharides and extracellular DNA (eDNA), as well as the physiological changes that occur in biofilm-associated bacteria. Due to this increased tolerance, treating biofilm-associated infections has proven difficult with traditional methods. Many researchers have begun to develop treatments that target the biofilm, reducing its integrity and dispersing the associated bacteria into their more susceptible planktonic form. This method of treatment focuses on us catabolic enzymes to target various parts of the EPS. Glycoside hydrolases (GH) target linkages in the exopolysaccharides while DNase targets linkages in the eDNA. We have previously shown that two GHs, α -amylase and cellulase, reduce the integrity of the EPS and lead to bacterial dispersion. However, these enzymes are not universally effective due to the complex communities of bacteria, suggesting that multi-enzyme cocktails may be required. In order to determine if we subjected biofilms, grown in vitro either in multi-well plastic plates or in a clinically relevant wound model, to different enzyme cocktails containing cellulase, α -amylase, xylanase, alginate lyase and/or DNase. We determined that the efficacy of enzyme cocktails depended upon the specific bacteria present, rather than the sheer number of species present. We next hope to test our cocktail in a murine wound model. By attacking different components of the EPS with multiple enzymes, we hope to create a cocktail that degrades the complex biofilms found in various human infections. We believe that a cocktail of enzymes coupled with current antibiotics could combat biofilm-associated infections more effectively.

School: Texas Tech University



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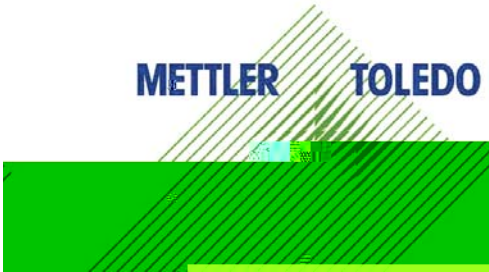
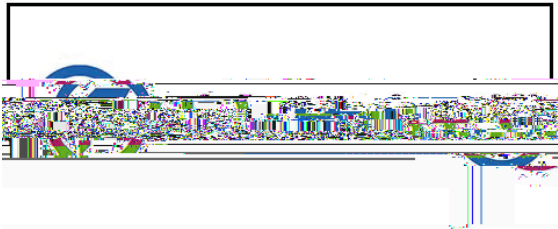
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