A Special Thanks

to

Texas Tech University Health Sciences Center

Ulrich Bickel, M.D.

Darrin D'Agostino, DO, MPH, MBA
Provost, Texas Tech University Health Sciences Center

Ron Hall, Ph.D.

Kerry LaPlante, Pharm.D.
"The Secret Life of a PI"

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G   **G**   Devin Lowe, Ph.D.

G   Prathysusha Naidu
"Ferutinin Induces Osteogenic Differentiation of Dental Pulp-Derived Stem Cells (Dpscs) by Upregulating BMP2 Signaling"

G   **G**   - Megan Ferry, Pharm.D.

Vardan Karamyan, Pharm.D., Ph.D.

Alan Saghatelian, Ph.D.

"

G

Nadezhda German, Ph.D.

G   Meredith Sigler, Pharm.D.

G Devin Lowe, Ph.D.

Grace Kuo, Pharm.D., MPH, Ph.D.,
Dean, School of Pharmacy

G *(Sciences and Residents)*

G **G** Meredith Sigler, Pharm.D.

G Iqra Pervaiz

"
Edited Induced Pluripotent Stem Cells"

G **G** Quynh Do, Ph.D.

" *Eed Pluripotoy*P•

Keynote Speaker

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Professor
Clayton Foundation Laboratories for Peptide Biology
Dr. Frederik Paulsen Chair
Salk Institute

Keynote Speaker

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Professor and Chair of Pharmacy,
University of Rhode Island, Kingston, RI

Adjunct Professor of Medicine,
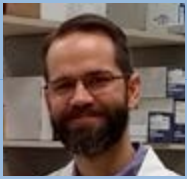Brown University, Providence, RI

Dr. LaPlante is the Department Chairperson and a tenured Professor of Pharmacy, as well as the founding Director of the Rhode Island Infectious Diseases Antibiotic Research Program at the Providence VA Medical Center.

As a licensed clinical pharmacist, LaPlante is an internationally recognized expert on antibiotic use, antimicrobial resistance, as well as health policy implementation. She remains on the frontline of the antimicrobial resistance public health crisis by leading statewide initiatives and serving as an advisor to the Centers of Diseases Control and Prevention, PEW Research Center and The Joint Commission.

She currently serves as chairperson for the Rhode Island Department of Health's Antimicrobial Stewardship and Environmental Task Force where she led the Rhode Island Antimicrobial Stewardship Expansion Initiative. In this role, she has created guidance and provided education for Antimicrobial Stewardship across Acute Care, Long Term Care and Urgent Care facilities throughout the State of Rhode Island, specifically for the CVS Minute Clinics Provider meeting at the at CVS National Headquarters in Rhode Island. During the COVID-19 pandemic, she was appointed to the COVID-19 vaccine subcommittee by the governor of Rhode Island.

Combining a clinical and scientific career, Dr. LaPlante has published over 120 peer-reviewed research articles, and she has received continuous uninterrupted funding with over 30 successfully awarded grants totaling over 20 million from the National Institutes of Health, the Department of Veterans Affairs, and Investigator-Initiated Research from Research and Development divisions of the pharmaceutical industry.

She is also Director of the Pharmacology Core for the Rhode Island NIH-COBRE Center for Antimicrobial Resistance and Therapeutic Discovery (1P20GM121344-01A1), a member of the Antimicrobial Resistance Leadership Group (ARLG), an elected Fellow of the Infectious Diseases Society of America (FIDSA) and the American College of Clinical Pharmacy, and a past president of the Society of Infectious Diseases Pharmacists (SIDP; 2018-2019). Her pharmacy research fellowship (2012-present) awarded from the Office of Academic Affiliations (OAA) at the VA's National Office is one of a limited number of nationally recommended fellowships by the American College of Clinical Pharmacy (ACCP). She is a vice-president at Making a Difference in Infectious Diseases (MAD-ID), and an Associate Editor for Clinical Infectious Diseases.
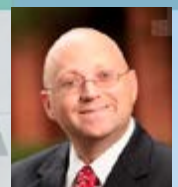
Assistant Professor, Department of
Immunotherapeutic and Biotechnology

Vice Chair, Department of
Pharmaceutical Science

Associate Professor, Department of
Pharmaceutical Science

Professor, Department of Pharmacy
Practice, Pharmaceutical Science

Assistant Professor, Department of Pharmacy Practice

Associate Professor, Department of Pharmacy Practice

Associate Dean, Office of Science
Professor, Department of Pharmaceutical Science

Associate Professor, Department
of Pharmacy Practice

Department of Pharmaceutical Science

Unit Manager, Office of Science

Department of Pharmacy Practice

Department of Pharmacy Practice

Darrin D'Agostino, DO, MPH, MBA
Provost | Texas Tech University Health Sciences Center | Lubbock

Grace Kuo, Pharm.D., MPH, Ph.D.
Dean | Jerry H. Hodge School of Pharmacy | Amarillo

Distinquished Speakers

John Griswold, M.D., FACS
Director | Clinical Research Institute | Lubbock

Theresa Byrd, DrPH, MPH, RN
Chair & Associate Dean | Department of Public Health | Lubbock

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Meredith Sigler, Pharm.D
Assistant Professor | Department of Pharmacy Practice | Dallas

Hoa Quynh Do PhD[1], Michaela Jansen PharmD -PhD[1]

Department of Cell Physiology and Molecular Biophysics and Center for Membrane Protein Research, School of Medicine,t

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Megan E. Ferry, Les P. Covington, Levi S. Campbell, Lindsay A. Courtney, Rodney B. Young, Karen J. Cutts, Michelle J. Lofranco, Eric J. MacLaughlin

G To determine if continuous glucose monitoring (CGM) is associated with improved A1c levels in older adults with type 2 diabetes mellitus (T2DM).

Uncontrolled T2DM exacerbates issues impacting many older adults. Use of CGMs in older patients is attractive due to the potential for increased risk of hypo- or hyperglycemia. While CGMs have demonstrated improved glycemic control and fewer adverse events in younger patients with T2DM, few studies have assessed their utility in older adult patients.

This study is prospective, self-controlled utilizing a pre-post pragmatic design. Eligible subjects were identified through an electronic health record (EHR) query from October 1, 2020 through September 30, 2021. Inclusion criteria include age 65 years, 1 appointment with a Family Medicine or Internal Medicine provider during the query timeframe, an ICD-10 diagnosis of T2DM, and prescriptions for prandial insulin. Exclusion criteria include being wards of the state, utilizing a CGM device prior to the study, <3 injections of insulin/day, or documented cognitive impairment. The primary outcome is change in A1c before initiation of a CGM device and 3 months following initiation. Secondary outcomes include A1c at 6 months, time-in-therapeutic range, average glucose, Glucose Management Indicator, other pertinent CGM metrics, total daily dose of insulin prescribed, and change in reported hypoglycemia symptoms. Descriptive statistics will be used for the analysis of patient characteristics. For the primary outcome and ordinal data, a Wilcoxon Signed Rank test will be utilized, and a McNemar test will be used to compare nominal variables. A sensitivity analysis will be performed on patients who have low sensor utilization.

200 subjects were identified, 74 met inclusion criteria, and 50 were eligible for study enrollment. Five subjects are currently enrolled, and recruitment is ongoing. Additional results are in progress.

Research in progress.

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Celine Zhong, PharmD, BCPS, Sze Yi Kong, PharmD, Craig Cox, PharmD, FCCP, BCPS

GOver the past two decades, the number of pharmacy schools in the United States has increased by almost 80%, urging the American Society of Health-System Pharmacists to recommend the use of a layered learning model to facilitate experiential training of student pharmacists and clinical teaching of pharmacy residents simultaneously. The primary aim of this study is to evaluate the impact of a layered learning model on student pharmacists' academic performance in the inpatient setting.

This is a multi-campus, retrospective, observational cohort study of student pharmacists in graduating classes of 2019 and 2020 between 5/1/2018 and 5/31/2020 who completed both Introductory Pharmacy Practice Experiences (IPPE) and Advanced Pharmacy Practice Experiences (APPE) in the adult medicine setting. The primary outcome is the summative/overall adult medicine clinical clerkship score received by IPPE student pharmacists precepted by a pharmacy resident versus full-time/adjunct pharmacy faculty. Secondary outcomes include final learning outcome scores on patient care process, rotation-specific, and interprofessional competencies, and professionalism for IPPE and APPE, retention of knowledge between IPPE and APPE, and IPPE student pharmacists' perception of preceptorship model. All data are obtained and blinded from the experiential office. Statistical analysis include t-tests and chi-square tests to compare continuous data and categorical data, respectively.

IPPE students in the pharmacy resident group receive statistically significant higher scores in patient care process (89.9% vs 87.4%, p=0.04) and interprofessional (96.8% vs 95.4%, p=0.0001) competencies when compared to the full time/adjunct pharmacy faculty group. The IPPE students' perception for the preceptors's commitment on educational experience was more positive in the pharmacy resident group than the full time/adjunct pharmacy faculty group (94.8%, 92.3%, p=0.04). There was no statistically difference in the other outcomes.

The layered learning model provides comparable/favorable academic performance outcomes on the students and a positive perception of having a resident preceptor.
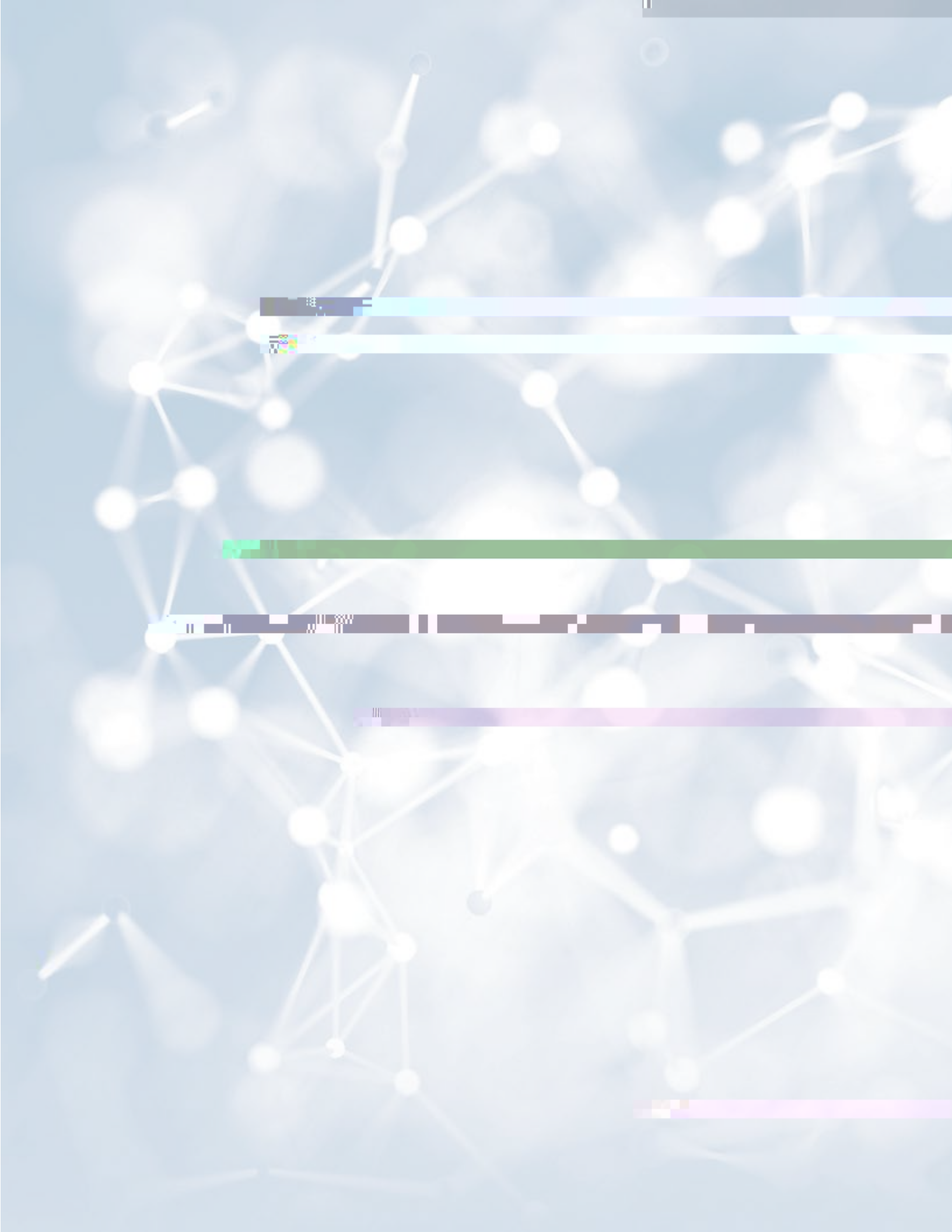
Yeseul Ahn, Ehsan Nozohouri, Sumaih Zoubi, Ulrich Bickel

T-cell receptor mimic antibodies (TCRm), a novel class of antibodies, recognize specific peptides in the context of MHC class I molecules with higher specificity and binding affinity than T-cell receptor (TCR). RL6A is one of TCRm antibodies that detects the endogenous peptide/MHC complex, YLLPAIVHI/HLA-A2 (YLL-A2). This peptide is derived from human P68 RNA helicase, which is extensively expressed in human breast cancer cells and, as well as in human brain endothelial cells. Our lab previously showed RL6A antibodies traffic via clathrin-independent endocytosis (CIE) in brain endothelial cells. In this study, we investigated RL6A internalization and trafficking mechanism, especially at the early endocytic pathway.

For quantification of the internalization process, we analyzed the amount of surface-bound TCRm antibodies on the human brain endothelial cells using flow cytometry. RL6A internalized from the surface of hCMEC/D3 cells in a biphasic pattern, rapid internalization in the early time points (>30% internalized within 10min) followed by a much slower phase at later time points. The signals for surface-bound RL6A were significantly reduced 120min after endocytosis initiation by induced Pluri-potent Stem Cells (iPSC) derived human brain microvascular endothelial cells (hBMEC). Furthermore, the mean fluorescence intensity (MFI) for surface-bound RL6A increased by around two-fold for the interferon-gamma (IFN-) treated cells. 3-D confocal images of a monolayer of hCMEC/D3 cells were obtained and analyzed for colocalization.

Patricia Ines Back, Qisheng Zhang, Ninh M. La-Beck

Liposomes are the most studied nanoparticle to enhance drug delivery and retention in tumors as a strategy to increase efficacy and decrease toxicity of cancer drugs. However, the biological impact of this lipid delivery system is poorly understood and viewed as secondary to the pharmacology of the drug cargo. The primary route of clearance for systemically administered liposomes is through macrophage internalization. Recently, we have found that liposomes induce M2 polarization in macrophages, suggesting they can modulate antitumor immune responses. We hypothesize that such effect may be related to the carrier's lipid composition, in particular cholesterol, which can be endogenously oxidized into oxysterols. Oxysterol production is related to cholesterol homeostasis and can directly affect macrophage metabolism and polarization state. Oxysterol metabolism is complex and many different oxysterols with different biological effects can be generated. Oxysterol 27-HC is linked to M2 polarization and tumor proliferation, and 25-HC can induce pro-inflammatory cytokine production. The impact and mechanisms by which liposome-derived cholesterol regulates macrophage functionality in the tumor milieu is unknown. This knowledge is necessary to engineer cholesterol analogs without protumoral activity, thereby improving the efficacy of liposomal drugs. The objective of this study is to characterize the impact of liposomes on macrophage lipid metabolism.

Macrophages were differentiated from bone marrow cells of C57Bl/6 mice and M0, M1 or M2 macrophages were generated using vehicle (no polarization stimulus), LPS 100 ng/mL or IL-4, respectively. After incubation overnight, cells were treated with liposomes (standardized at 55.7 µM phospholipids) or dextrose vehicle. After 24h, cells were collected and processed for lipidomics analyses.

Sample analyses are ongoing and we anticipate to have results in May. We expect that the effects of liposomes on different lipid pathways will depend on macrophage polarization states.

Sounak Bagchi, Nausheen Syeara, Dhavalkumar Patel, Vardan T. Karamyan

Ross Bryan, PharmD, Jamie McCarrell, PharmD, BCPS, BCGP, FASCP

Exogenous iron supplementation improves hemoglobin synthesis and aids in the repletion of iron reserves for various indications. Parenteral, or intravenous (IV), iron supplementation comes in various forms which are often utilized in cases of severe deficiency or when oral formulations are not able to be used. BSA Health System (BSAHS) currently carries three IV iron products; iron sucrose, iron dextran, and ferric gluconate. Considering the differences in cost, approved indications, and recommended dosages across these available formulations, a medication use evaluation was performed. Results are currently pending. Analysis and conclusion will be presented at Texas Tech University Health Sciences Center Jerry H. Hodge School of Pharmacy Research Days.

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Krystal K. Haase, Pharm.D. FCCP, BCPS, BCCCP, Amanda N. Charlton, Pharm.D.
Taryn B. Bainum, Pharm.D., BCPS, BCCCP, Ross Singletary

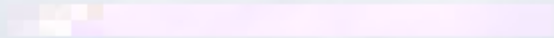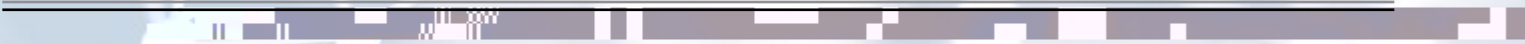**G**Stroke is the leading cause of serious long-term disability in the United States. Although current guidelines recommend against the use of antihypertensive   y   senseu   E   u   A
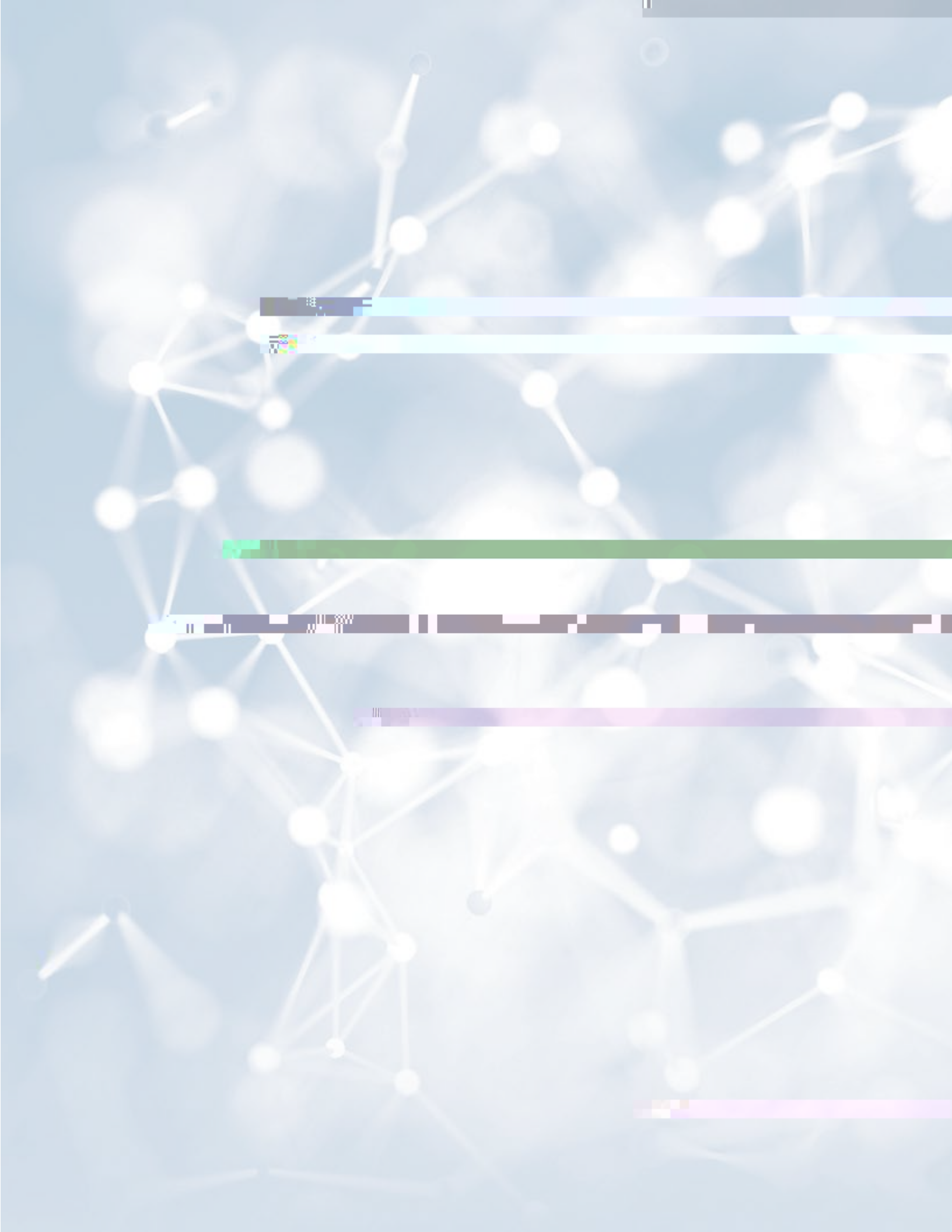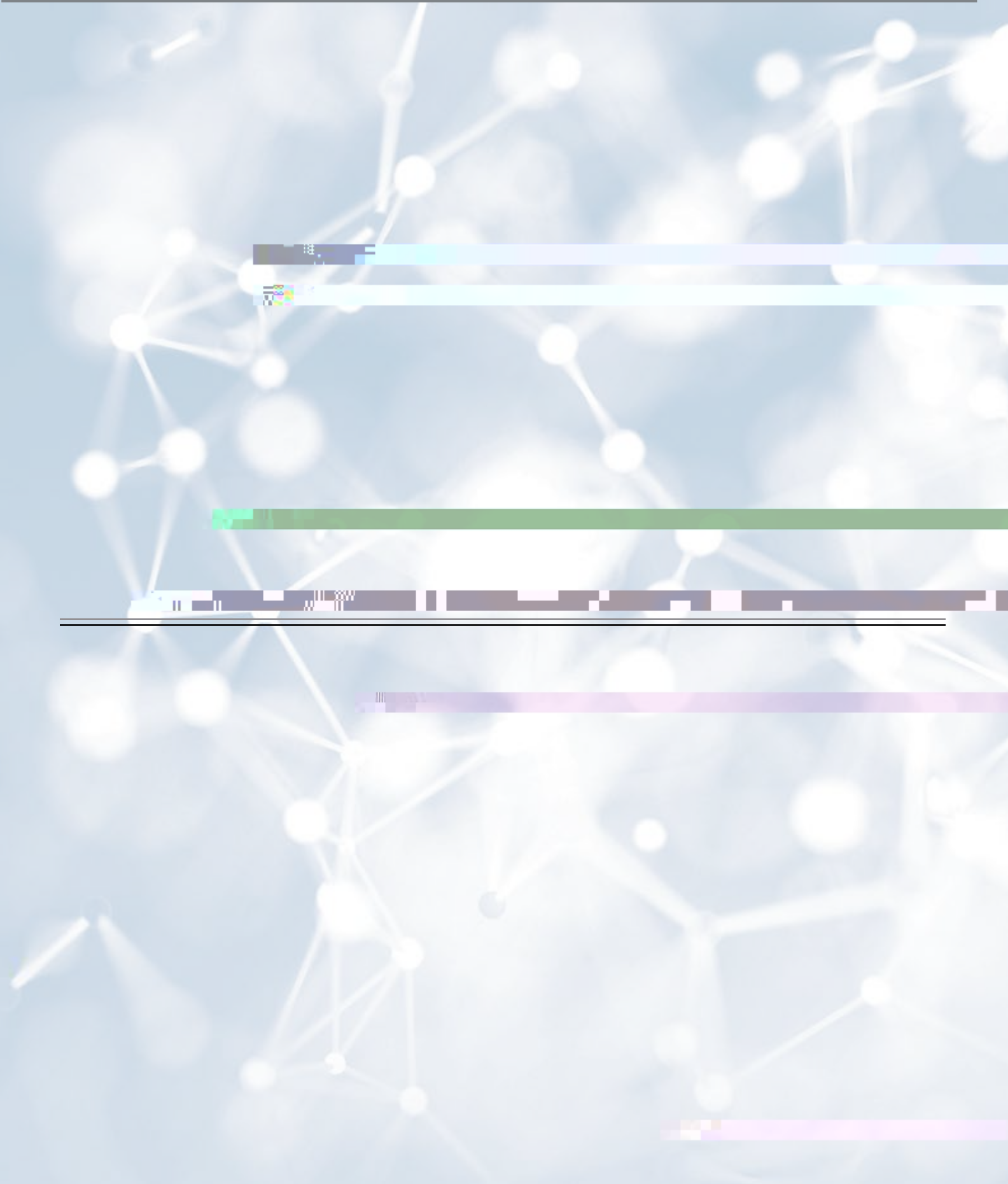
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<u>Karlyn E Hood, Pharm.D., BCPS</u>, Les P. Covington, Pharm.D., Nicole Lopez, M.D.,
Eric J. MacLaughlin, Pharm.D, Rodney Young, M.D.

G he purpose of this study was to evaluate the impact of a pharmacist-initiated spirometry clinic in patients with chronic obstructive pulmonary disease (COPD) and describe drug therapy modifications made by the pharmacist.

This is a prospective single site study of outpatients seen at Texas Tech Physicians of Amarillo Family Medicine clinic starting 12/01/2021-
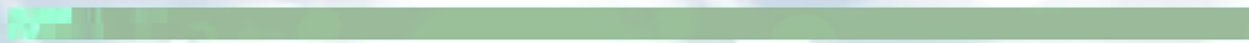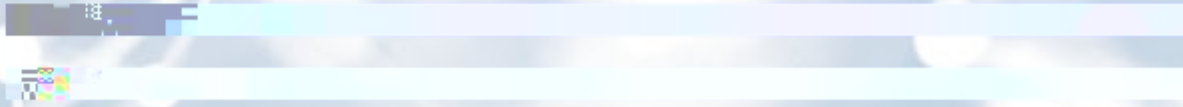
Md. Rakibul Islam,[1] Patricia Back, [1] Jalpa Patel,[1] Hilary Shmeeda,[2]
Savanna Stevens,[1] Konstantin Adamsky,[3] Alberto A. Gabizon,[2,4] Ninh M. La-Beck.[1,5]

[2]

Levco Pharmaceuticals Limited, Petah-Tikva, Israel

[4]

[4]

Fibrosarcoma is a rare and aggressive soft tissue sarcoma that occurs in infants and adults alike. For surgically unresectable or late-stage fibrosarcoma, doxorubicin is the standard of care but it has significant limitations in terms of its toxicity profile and response rate. A major mechanism of resistance to this anti-cancer therapy is immunosuppression in the tumor microenvironment (TME) mediated by myeloid and T-regulatory cells. In this study we explore the strategy to co-encapsulate doxorubicin with alendronate, an amino-bisphosphonate which modulates tumor infiltrated myeloid cells, in pegylated liposomes to make a safer and effective alternative to the standard of care. We postulate that co-encapsulating alendronate with doxorubicin in pegylated liposomes (PLAD) will favorably modulate the TME and increase the efficacy of doxorubicin since alendronate abrogates the activity of myeloid cells and liposomes target drug delivery to tumors.

WEHI-164 fibrosarcoma cells were implanted in 8-10 weeks-old male balb/c mice. Animals were randomized to PLAD, pegylated liposomal doxorubicin (Doxil), or free doxorubicin (FDox) at 8 mg/kg of doxorubicin (n=9/group), or dextrose (vehicle) or pegylated liposomal alendronate (PLA) at 3.28 mg/kg alendronate (same dose as PLAD) (n=5/group). Five days post-treatment, animals were euthanized, and tumors were processed for flow cytometric analyses.

PLAD and Doxil decreased M2-polarized macrophages, T-regulatory cells, and CD4/CD8 ratios in tumors, while activated natural killer cells were increased compared to the control. PLA decreased M2-polarized macrophages but did not have any impact on T-regs, while FDox had the opposite effect. Doxil and PLAD significantly increased uptake of doxorubicin in acrophages and other myeloids, compared to FDox. These effects were greater with PLAD than Doxil.

Co-delivery of doxorubicin and alendronate remodeled the TME towards an immune-permissive milieu. Ongoing studies will determine the anticancer efficacy of PLAD.

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Jeremy H. Johnson, Emily M. Buatois, Krystal K. Haase, Eric J. MacLaughlin, Kenna D. Payne

GTo characterize prescribing practices, including the use of guideline-recommended treatments for secondary stroke prevention at discharge and factors that influence concordant prescribing in a primary stroke center in West Texas. Prior studies have emphasized the importance of appropriate prescribing of secondary prevention medications at discharge. Appropriate and timely follow-up after discharge is also imperative. Overall, medications prescribed on discharge may be associated with improved long-term adherence.

This is a retrospective cohort study of adult patients admitted between January 2018 and March 2020 with a diagnosis of acute ischemic stroke or transient ischemic attack based on ICD-10 codes. Patients with a history of atrial fibrillation/flutter, use of an oral anticoagulant before hospital admission, intracranial bleeding during admission, history

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Kyle Mimun, Ashrafur Rahman, Thomas J. Abbruscato

Neuropathic pain following stroke, termed central post-stroke pain (CPSP), is reported in as many as 18% of poststroke patients, often manifesting as spontaneous or evoked pain in the form of mechanical allodynia and thermal hyperalgesia. To date, there is no viable treatment available for the alleviation of CPSP due to the lack of sufficient data needed to understand the pain perception pathway involved. Here, we will investigate a potential pain perception pathway that is activated after stroke, as well as its implications in the generation of CPSP. In addition, we aim to find a suitable treatment approach to alleviate stroke patient pain for maximal engagement in post stroke rehabilitation. Previous reports have shown that antagonists of the prostaglandin E2 (PGE2), EP2 and EP3 receptors, could be involved in modulating the secondary injury mechanisms responsible for the inflammatory and apoptotic reactions occurring in the ischemic cortex, demonstrating its potential involvement in neuroprotection, as well a possible role in attenuating CPSP. During stroke, a hypoxic and nutrient deprived environment proliferates at the site of lesion, resulting in neuronal damage and astrocyte activation, which may then bring about the release of various pain associated inflammatory markers associated with a prolonged, persistent pain state. In this study, we will utilize immunoblotting to examine the expression of CPSP related proteins in neurons, such as, nuclear factor kappa B, tumor necrosis factor alpha, interleukin-1 beta, cyclooxygenase-2, mitochondrial PGE2 synthase-1, PGE2 EP2 receptor, PGE2 EP3 receptor, and Neu-N. These CPSP related proteins will be examined in primary neurons exposed to the oxygen glucose deprived (OGD) condition for 3 hours, followed by recovery for various time periods under normal oxygen-glucose conditions. In addition, we will also examine the expression of CPSP related proteins in neurons treated with EP2 and EP3 receptor antagonists during the post-OGD recovery periods.

Mariam Oladejo, Hong-My Nyguyen, Laurence. M.Wood

Renal Cell Carcinoma (RCC) is the deadliest urological cancer with an abysmal overall survival probability of 12% after metastasizing. Various factors contribute to the aggressive phenotype of RCC, the most prominent of them being related to vascularization. CD105 is a 180kDa transmembrane glycoprotein that is a co-receptor for the TGF- signaling complex and is implicated in angiogenesis in various forms of cancers including RCC. In RCC CD105's expression is modulated on both the tumor cells and vasculature and this expression corelates with a poor prognosis. This dual enrichment also makes CD105 an antigen of high potential that can be targeted by an active vaccination platform such as Listeria monocytogenes-based vaccine.

The efficacy of a Listeria based vaccine directed against CD105 (Lm-LLO-CD105) was tested in syngeneic subcutaneous and orthotopic models of RCC utilizing murine renca cell line in male Balb/c mice. Lm-LLO CD105 significantly reduced the tumor growth in a subcutaneous model. Flow cytometry analysis further confirmed that this vaccine increased the population of polyfunctional tumor infiltrating lymphocytes and reduces the population of T-regs in the tumor microenvironment of the CD105 vaccine treatment group compared to the control vaccine group. Furthermore, we confirmed that the efficacy of Lm-LLO-CD105 is dependent on the activity of cytotoxic CD8+ T cells in an orthotopic model, we further observed that Lm-LLO-CD105 has appreciable effect on angiogenesis as observed by a reduced hemoglobin content in the CD105 vaccine treated tumors. Lastly, Lm-LLO-CD105 demonstrates an acceptable safety profile with minimal effect on wound healing process in vaccinated mice.

In conclusion, Lm-LLO-CD105 demonstrates a high therapeutic efficacy with minimal side effect and a high potential for translation into clinical settings.
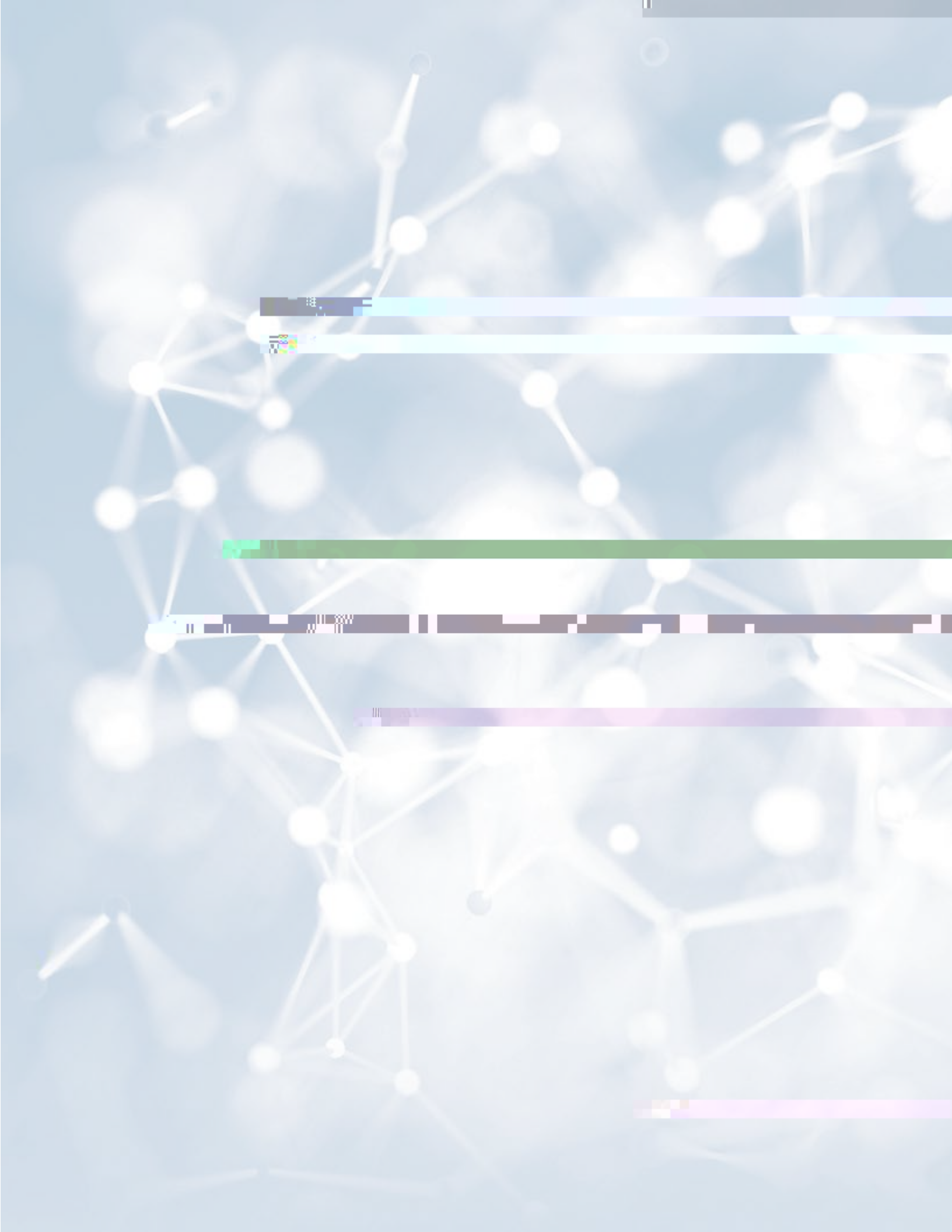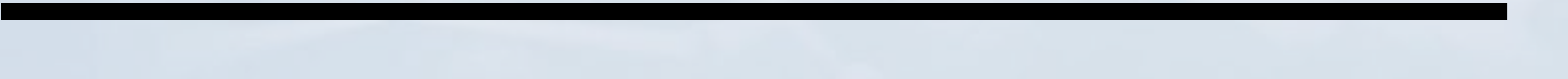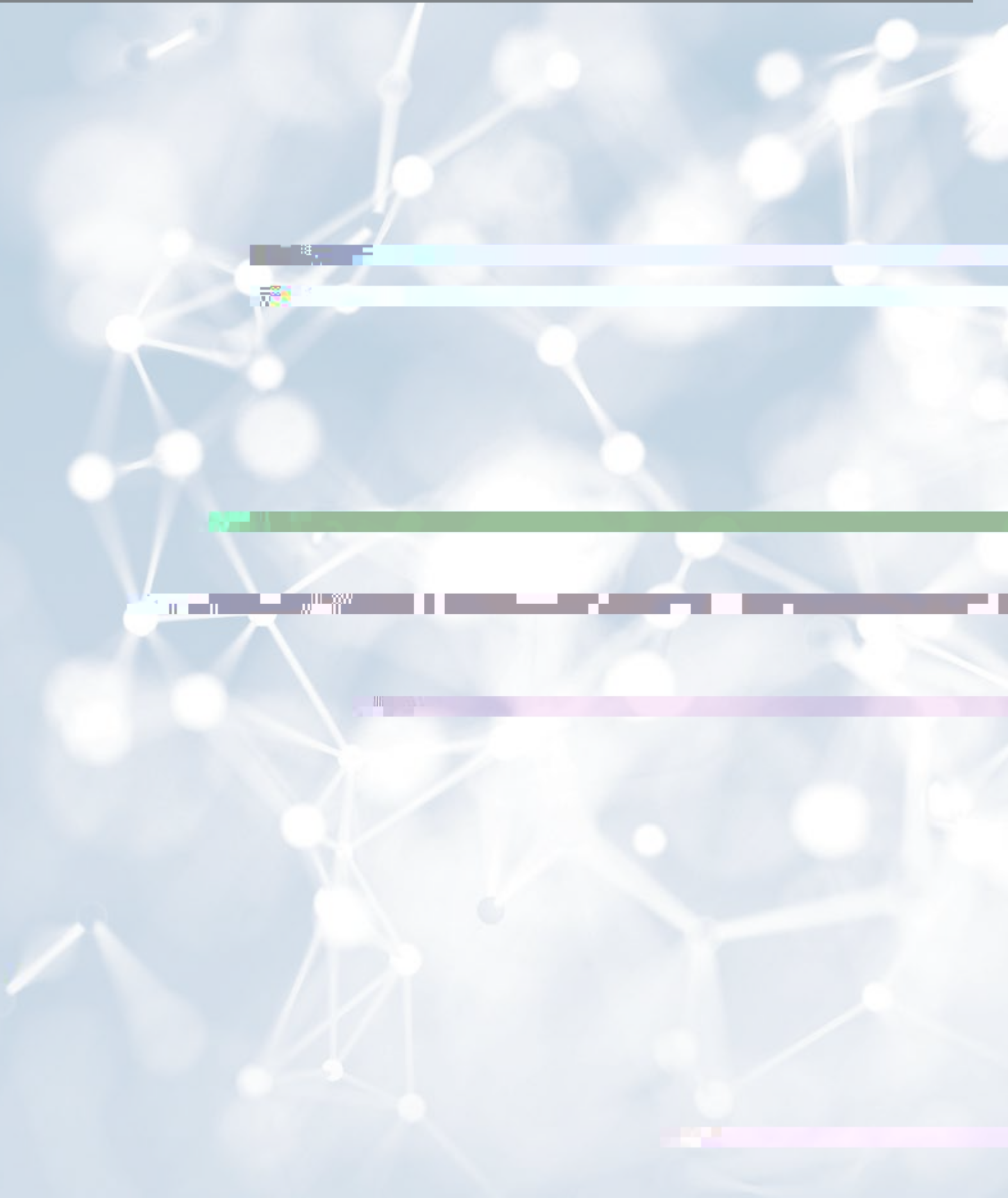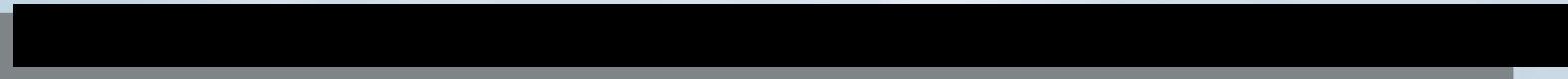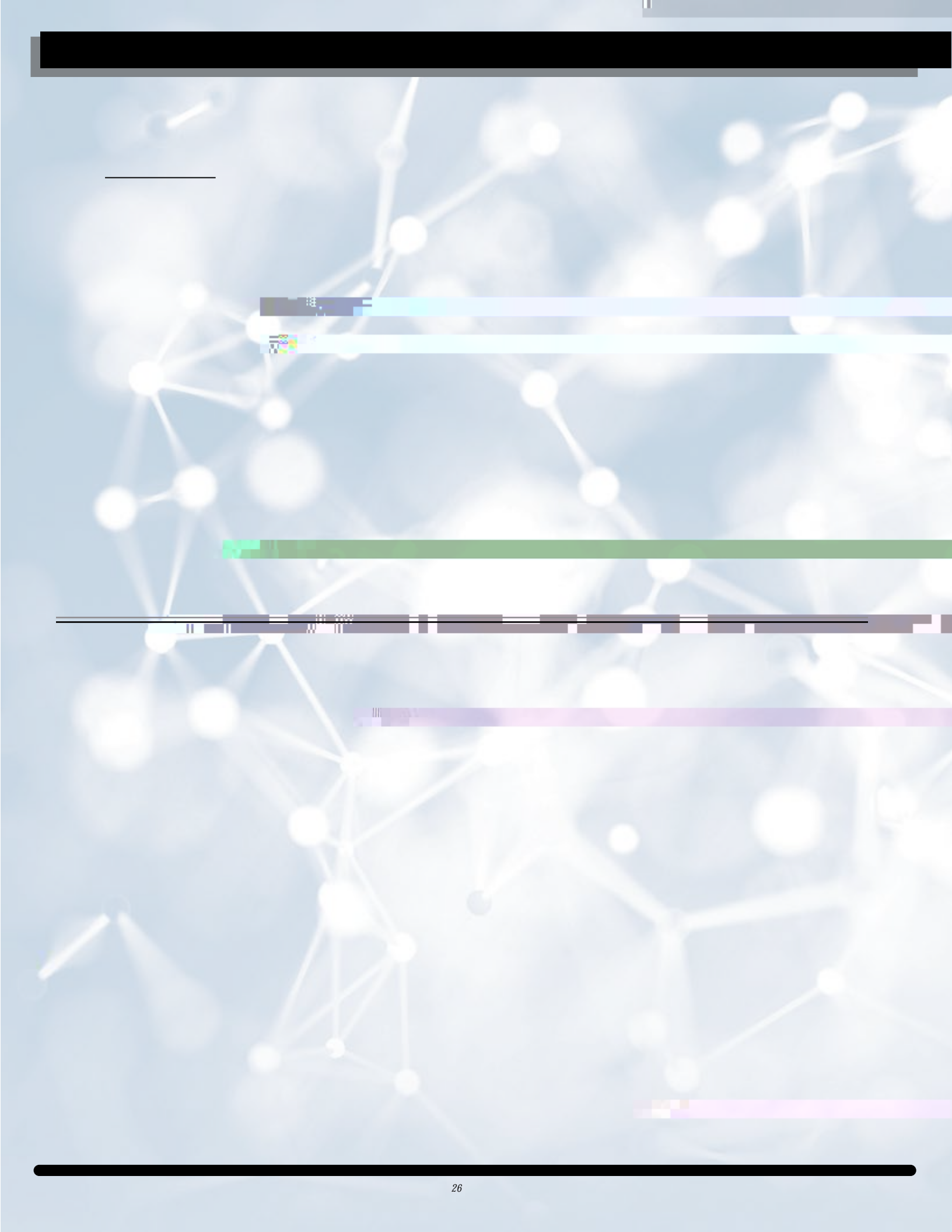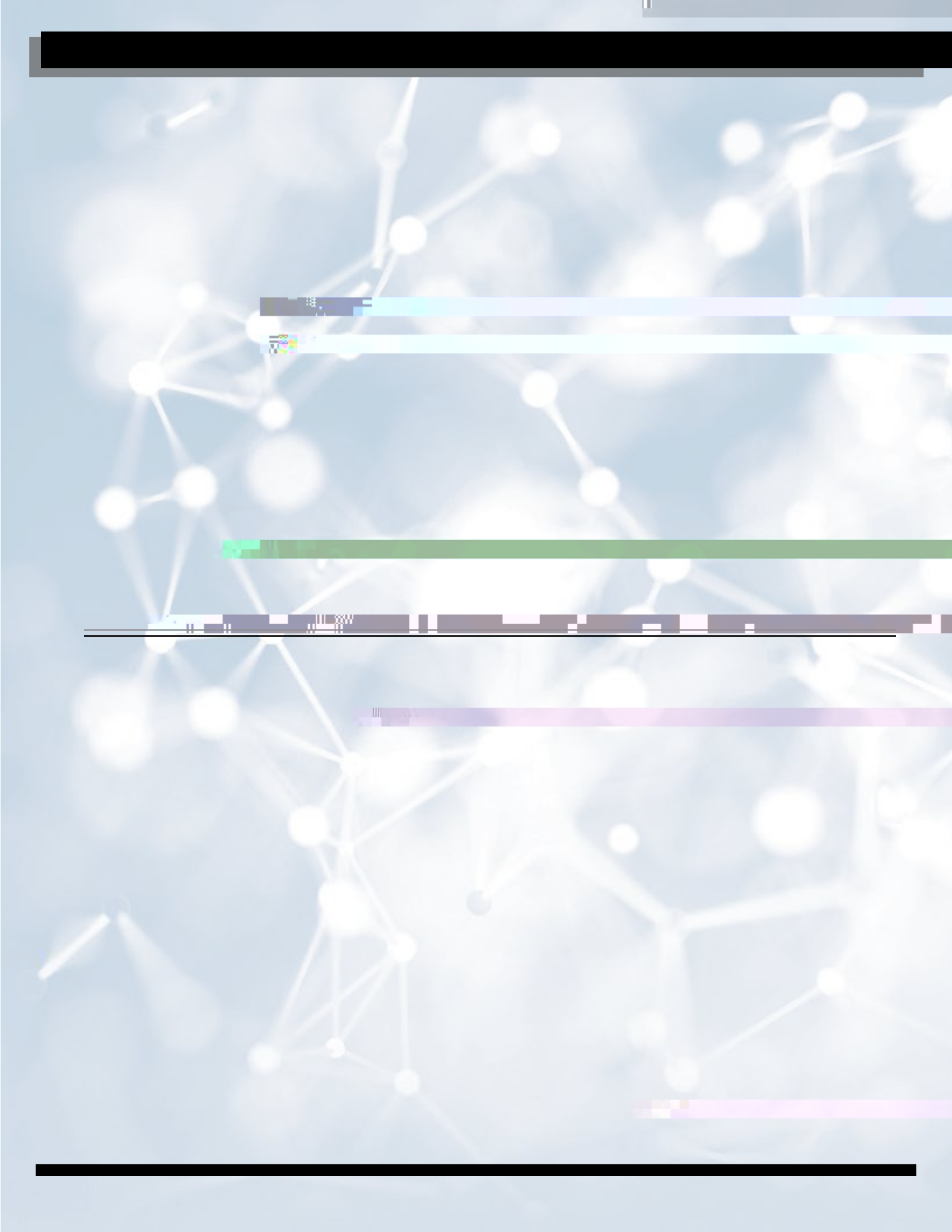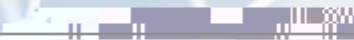
Annmarie Vallomthail, PharmD; Stephy George PharmD, BCPS, BCCCP; Kristi Carter PharmD, BCPS, BCCCP; Katie Calkins PharmD; Tanna Nelson PhD, RN-BC, CPHIMS; Margarita Taburyanskaya PharmD, BCPS

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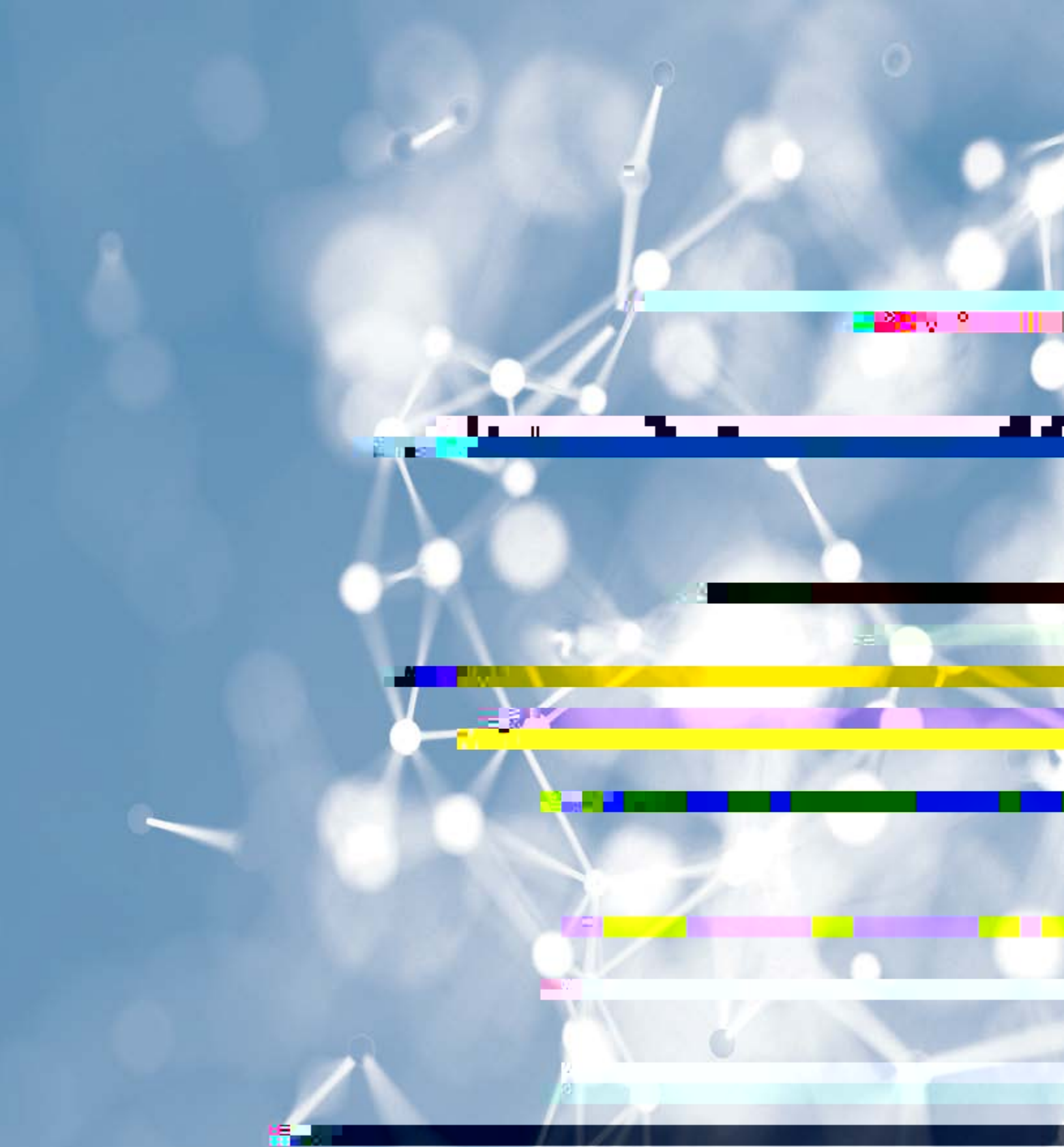
Yong Zhang[1], Sabrina Rahman Archie[1], Ghanwatkar Yashwardhan[1], Sejal Sharma[1], Saeideh Nozohouri1, Elizabeth Burks[1], Alexander Mdzinarishvili[2], Zijuan Liu[2] and Thomas J Abbruscato1

Department of Pharmaceutical Sciences, [2]Imaging Core at Office of Sciences,