

*Path*FINDER

WINTER 2023

Lomas and Yale



SCHOOL OF MEDICINE
DEPARTMENT OF PATHOLOGY

*Path*FINDER

Welcome to the Winter 2023 issue of the PathFINDER. 2023 looks to be a busy year as we work to finalize the laboratory plans for the new Critical Care Tower opening in October 2024. The new tower will have a second TriCore laboratory with a blood bank, point of care, phlebotomy services and gross and frozen section rooms to serve the new 18 operating rooms and ICU units housed in the tower. Huge thanks to Matt Luke and the TriCore team of Marcia Wooley, Kim Schneider, Channelle Salazar, and Ivana Bononcini, who have doggedly advocated for the space and equipment for us to provide the necessary lab services.

Our faculty feature is of Dr. Jay Raval, Associate Professor, Senior Director of Transfusion Medicine and Apheresis, and newly appointed Vice Chair for Clinical Affairs. In addition to his leadership with our clinical operations and his own clinical practice, Dr. Raval has a strong research program focusing on transfusion medicine. Our department's Medical Laboratory Sciences program is highlighted as Dr. Barbara Masten provides introductions to the MLS faculty with their recent recruits and returning faculty of Ms. Nykkole McCary and Ms. Julia Allen, and Dr. John Scariano. The MLS program serves to expand our laboratory workforce and has a remarkable record of attracting a diverse undergraduate class reflecting the diversity of New Mexico.

It is a pleasure to feature our talented Pathology Biomedical Sciences Graduate students! We currently have nine students, and report on the important research they are conducting in our department's research laboratories. We welcome two new Pathology faculty, Dr. Aysha Mubeen in Anatomic Pathology and Dr. Audra Kerwin, our former resident and forensic fellow, joins the Office of the Medical Investigator. Two significant faculty retirements are noted, Drs. Richard Larson and I-Ming Chen, both of whom have had long, productive, and impactful careers at UNM.



In News and Awards, congratulations to Dr. Jennifer Gillette as the 2022 recipient of the Regents Lecturer Award, for her outstanding accomplishments in research, education, service, and mentoring. Dr. Larry Sklar is an inductee in the Associated Alumni Hall of Fame for Central High School, Philadelphia, the nation's oldest high school (187 years), based on his outstanding achievements as an inventor of significant new medical technologies. Dr. Dario Marchetti's lab recently published in *Cancer Research Communications* ground-breaking research on a melanoma Circulating Tumor Cells signature associated with brain metastases.

Lastly, please note on the last page of PathFINDER the list of five departmental funds available for your charitable giving, largely focused on supporting Pathology resident and fellow training. Gifts are appreciated any time of the year!

Nancy Joste, MD

Professor & Chair of Pathology

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COVER IMAGE: UNM Hospital Tower view from Lomas and Yale courtesy UNM Hospitals: In 2021, UNM Hospital broke ground on a seven-level, 96-bed critical care tower. Over a decade in the making, this contemporary medical facility will help UNMH further its mission of caring for more New Mexicans in New Mexico when it debuts in 2024.

Feature

OUR NEW DEPARTMENT VICE-CHAIR FOR CLINICAL AFFAIRS

BY JAY RAVAL, MD, ASSOCIATE PROFESSOR & VICE-CHAIR FOR CLINICAL AFFAIRS



YOU BECAME THE PATHOLOGY DEPARTMENT VICE-CHAIR FOR CLINICAL AFFAIRS A FEW MONTHS AGO. HOW WOULD YOU DESCRIBE THE TRANSITION TO THIS LEADERSHIP ROLE?

It was a privilege to be selected by Dr. Joste to succeed her as our department's Vice-Chair for Clinical Affairs and have the opportunity to help continue to make our department even better. When I accepted this position, I had four major goals:

- Assist our faculty to create, improve, or remedy clinical processes in our department.
- Address issues and assess opportunities that impact clinical operations or clinical research.
- Continue to build upon and improve our relationships with our clinical colleagues.
- Support Dr. Joste's goals for our department.

Through my experiences in the Section of Transfusion Medicine and Therapeutic Pathology, obtaining a better understanding of our department and TriCore, and serving on committees and working groups comprised of clinicians, pathologists, technologists, researchers, nurses, and/or administrators, I have been able to interact collegially and collaboratively with members of this diverse group and cultivated many positive relationships throughout our UNM system. I believe this background will assist me in the duties of my new role.

HOW WOULD YOU DESCRIBE SOME OF THE CHALLENGES FACED BY THE DEPARTMENT OVER THE PAST COUPLE OF YEARS?

The COVID-19 pandemic disrupted so many things – our families, both at home and at work, were abruptly flung into the largest global health emergency the world has seen in a century. Finding ways to continue our routine operations while also improvising and innovating to address the challenges caused by the pandemic challenged everyone. The Department of Pathology and its members had crucial services to offer our hospital, university, government, and patients. Phlebotomists, technologists, nurses, pathologists, researchers, educators, and administrators all had unique issues to tackle in order to perform their duties while simultaneously juggling the specter of illness. Admirably, we persevered and succeeded in so many endeavors to fulfill our various missions.

WHAT IS YOUR VISION FOR OUR DEPARTMENT'S CLINICAL MISSION?

UNM Pathology will continue to provide excellent and effective diagnostics and therapeutics. Our faculty, staff, and learners will support our hospital, healthcare members, and patients to the best of their abilities, and in turn expect to be supported to achieve their goals and find joy in their work. Where problems exist, we will solve them. Where things are working well, we will bolster those individuals and processes. When we encounter the next new challenge, we do what UNM Pathology has always done: brainstorm, innovate, and implement. And if we fail, then we fail fast, fail forward, and make it better.

WHICH ACCOMPLISHMENTS ARE YOU MOST PROUD OF IN YOUR CLINICAL AND RESEARCH ENDEAVORS?

I am thankful to work in a department that values innovation and effectiveness. Many of the changes that have been made in the Section of Transfusion Medicine and Therapeutic Pathology are the result of encouraging and supporting such values. During the pandemic, our team opened the Therapeutic Apheresis Program Clinic, further optimized blood product ordering and distribution by leveraging information technology tools, onboarded novel blood products and apheresis technologies, created/improved several blood bank-related processes and policies at UH and SRMC, contributed to the development of a cellular therapies laboratory, and participated in clinical trials for a myriad of patients suffering from conditions like COVID-19, myocardial infarction, and traumatic injury. These have been proud accomplishments for me and our wonderful team in the past few years. As I continue in my new role to serve the department, I hope to be able to support others to achieve their goals.

WHAT ARE YOUR FAVORITE MOMENTS?

Spending time with my family and friends, both near and far. Appreciating the understanding and patience of my immediate NM family (Marian, Sydney, and Pearce) when things get busy. Brainstorming with colleagues - including technologists, nurses, trainees, administrators, and faculty within and outside of Pathology - about how to best solve a problem. Long hikes. Seven hours of sleep. Pathology 'Happy Hour'.

Feature

MEET THE UNM MEDICAL LABORATORY SCIENCES PROGRAM FACULTY

BY BARBARA MASTEN, PHD, PROFESSOR & MLS PROGRAM DIRECTOR

A LITTLE ABOUT THE PROGRAM

The UNM Medical Laboratory Science (MLS) Program is the pipeline for Medical Laboratory Scientists in New Mexico and beyond. Medical Laboratory Scientists are highly skilled professionals and a vital part of the healthcare team that provides accurate, timely, and reliable results that help physicians determine the best treatment for their patient. The MLS Program has five faculty and two staff members. The Department of Pathology gives a warm welcome to the three newest faculty members, Nykkole McCary, Dr. John Scariano, and Julia Allen, who all have ties back to UNM. Read below to gain an insight into all the members of the MLS Program.

NYKKOLE MCCARY, MLS(ASCP)CM

Nykkole McCary is the Instructor for Clinical Microbiology and Parasitology, Co-Instructor for Molecular Diagnostics, and the Clinical Coordinator for the UNM MLS Program.

Nykkole graduated from the UNM MLS Program in 2013 and began her Microbiology career at CHRISTUS St. Vincent hospital in Santa Fe, NM. She worked there for eight years, with four of those years as the Microbiology Section Coordinator, before returning to UNM to teach while continuing to work per diem at St. Vincent. Nykkole joined the UNM MLS faculty in December, 2020. To quote Nykkole, "I wanted to come back "home" to UNM because I had such a great experience in the program that I wanted to be a part of making the experience great for future students and share my clinical experience with students."

JOHN SCARIANO, PHD

Dr. John Scariano is the Instructor for Clinical Chemistry and Urinalysis for the UNM MLS Program. Dr. Scariano graduated from the University of Colorado Medical Technology Program in 1984 and subsequently worked at Swedish Medical Center outside of Denver, Saint Vincent Hospital in Santa Fe, and Ochsner Medical Center in New Orleans, gaining experience in the areas of hematology, blood bank, clinical chemistry and toxicology. Dr. Scariano became an Instructor for the UNM MLS Program in 1989 and taught from 1989-2015 and delivered content to other student cohorts, consulted for the UNM Division of Endocrinology, and advised a clinical laboratory in Santa Rosa, NM. In 1998 and 2002, Dr. Scariano earned an M.S. and Ph.D., respectively in Biomedical Sciences from the UNM School of Medicine. Dr. Scariano retired from UNM in 2015 and remained as a facilitator for the Clinical Reasoning block and a Lecturer for the Division of Endocrinology. This past year, Dr. Scariano returned as faculty in the UNM MLS Program. Dr Scariano shared that his "home department has always been Pathology and it is wonderful to be back."



**SCHOOL OF
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**MEDICAL LABORATORY
SCIENCES PROGRAM**



Medical Laboratory Sciences Program faculty and staff from left to right: Amalia Estanislao, Barbara Masten, Nykkole McCary, Julia Allen, Rosalia De Leon, Margaret Alba, John Scariano.

JULIA ALLEN, MLS(ASCP)CM

Julia Allen is the Instructor for Hematology for the UNM MLS Program. Julia earned a B.S. in Biology from right here at UNM, then attended a hospital-based MLS program in Pueblo, Colorado to become ASCP certified. After working in the laboratory and being a clinical preceptor for several years, Julia furthered her laboratory education and earned a M.S. in MLS from the University of North Dakota. Julia's laboratory experience mostly centers around hematology and microbiology, along with experience as a generalist. Julia's husband was in the military, so the past 15+ years was a "tour de U.S. Army style" providing Julia with experience at a number of clinical laboratory locations, including Colorado, Texas (both San Antonio and El Paso), and Tennessee. Prior to joining the UNM MLS faculty this past summer, Julia was an Instructor and Clinical Education Coordinator for the MLT Program at Volunteer State Community College, Gallatin, TN. To quote Julia, "Our family considers NM to be home, and now that my husband's Army journey has come to an end, we are so happy to finally have landed back in the Land of Enchantment!"

MARGARET ALBA, DOM, MLS(ASCP)CM, BB(ASCP)

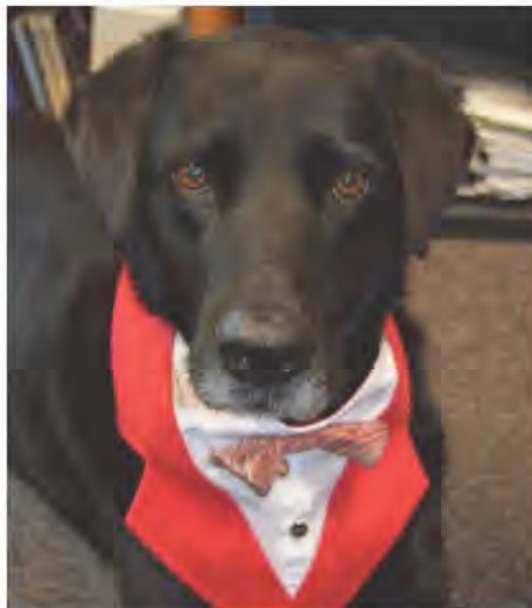
Margaret Alba is the Associate Director of the UNM MLS Program. Margaret received a B.S. in Medical Technology from the University of Texas, El Paso, Texas in 1989. Margaret worked in trauma hospital labs as a generalist and blood banker in Arizona, Nevada, New Mexico, and Texas for 20+ years and joined the MLS faculty in 2007. Margaret is also a Doctor of Oriental Medicine and ran a private acupuncture practice for 18 years. Her 'lab' dog Louie (a rescue from Gallup, NM), helped to ease stress for many of her patients. Louie now brings smiles to students in Margaret's classes (Blood Bank, Management, Serology and other classes). To quote Margaret, "I work with students of all ages and majors, from junior high to medical program students so I'm inspired to create innovative ways to learn based on the student's need. You may find my students learning while playing interactive games like Serology Labopoly or Lab Review Bingo. It's awesome!"

BARBARA MASTEN, PHD, F(ACHI), MLS(ASCP)

Dr. Barbara Masten is a Professor and the Director of the UNM MLS Program, and the Medical Director of the HLA Lab at TriCore Reference Laboratories. Barbara has a B.S. in Metallurgical Engineering (1980) from the University of Cincinnati, Cincinnati, Ohio, a B.S. in Clinical Laboratory Sciences (1988) from Weber State University, Ogden, Utah followed by a Ph.D. in Microbiology and Immunology (1993) from Texas Tech University, Lubbock, Texas. Barbara joined the Department of Pathology in 1994 as a Post-Doc for Dr. Mary Lipscomb. Barbara completed a Pathology-TriCore co-sponsored Histocompatibility Director-In-Training Program in 2005 and earned Diplomate status from the American Board of Histocompatibility and Immunogenetics in 2006. Barbara joined the MLS faculty in 2007 and currently teaches Clinical Immunology, Clinical Management and Education, and Molecular Diagnostics for the MLS Program; and is a team instructor for the BioMed graduate Immunology course and for medical students in the Microbiology and Immunology Block. To quote Barbara, "I have the best of both worlds by directing a clinical lab and preparing students for a career as a Medical Laboratory Scientist."

AMALIA ESTANISLAO, TEACHING ASSISTANT

Amalia Estanislao is the Teaching Assistant for the UNM MLS Program. Amalia received a B.S. in Medical Technology in 1983 from the University of Santo Tomas, Manila, Philippines. Amalia expanded her healthcare knowledge by taking some nursing courses at UNM, but found Medical Technology is what she truly loves. Amalia worked at Quest Diagnostics at Lovelace Westside Hospital as a generalist for more than 27 years. Amalia joined UNM MLS as a teaching assistant in April, 2019. Amalia is the backbone of the MLS student laboratory! She assists the MLS instructors with preparing laboratory activities, maintains the equipment and supplies, and keep the laboratory clean and organized, while helping students during lab time. To quote Amy, "What brings me the most joy is helping the students and sharing my experiences with them."



Louie the MLS Program Mascot.

ROSALIA DE LEON, EDUCATION SUPPORT COORDINATOR

Rosalia De Leon is the Education Support Coordinator for the UNM MLS Program. Rosalia performs a wide variety of administrative duties that support the faculty, staff and UNM. Her main focus is the students. Rosalia started her journey with UNM in 2010 and been part of the MLS Program since 2016. Rosalia has an A.A. degree in Business Operations/Accounting from Brookline College, Albuquerque, NM. To quote Rosalia, "The MLS Program is my second family and I love helping students with their needs."



Medical Laboratory Sciences Program students 2022-2023.

Pathology Research Laboratory Graduate Students

PARISA NIKEGHBAL - STEINKAMP LAB

I started working in Dr. Steinkamp's lab as a rotation student in Jan 2022 and I joined the lab officially two months later. During my rotation, I found out that I will never be alone if I join the lab as all the people are always willing to help and contribute. In addition, the most important reason to join this lab was Dr. Steinkamp. She helped me to gain a deeper understanding of the scientific process, learn how to plan different experiments and report my findings. She is so supportive and always provides the guidance and feedback that I need to thrive on this path. Moreover, the research focus of Dr. Steinkamp's lab was so interesting to me as I have always wanted to learn more about cancer. Our lab is interested in ovarian cancer because, despite important advances in the treatment of this disease, the lethality remains high due to diagnosis at a late stage when cancer cells have already metastasized to the peritoneal cavity.

The main focus of my research is on the effect of macrophages on ovarian cancer chemoresistance and how these macrophages can be targeted to treat ovarian cancer. Immunosuppressive macrophages associate with ovarian cancer spheroids and release growth factors that influence cancer cell growth and chemoresistance. The hypothesis of my project is that spheroid-associated macrophages contribute to chemotherapy resistance in ovarian cancer cells and therefore can be targeted for therapy. To test this hypothesis, we are co-culturing macrophages with human ovarian cancer cells grown as monolayers or as 3D spheroids and treating them with varying

concentrations of the chemotherapies paclitaxel and carboplatin to demonstrate that macrophages reduce the sensitivity of ovarian cancer cells to chemotherapies in 2D and 3D cultures. Our lab has developed patient-derived xenograft (PDX) models from primary spheroids isolated from the malignant ascites fluid of ovarian cancer patients during cytoreductive surgery. We are using these PDX models and established cell lines in our studies. We are also testing whether low-dose chemotherapies or macrophage-targeted therapies can repolarize tumor associated macrophages in order to boost anti-tumor immune responses in our ovarian cancer models. The long-term goal of my research is to identify combination therapies that can promote an anti-tumor immune microenvironment and improve patient response.

In my free time, I enjoy outdoor hobbies, hiking, and camping, and indoor hobbies such as baking cakes, as it has always been my dream to run a bakery shop.



RAHUL KUMAR - GULLAPALLI LAB

My name is Rahul Kumar, and I am currently working as a research assistant at The University of New Mexico in the Department of Pathology. I am currently in the gallbladder and liver cancer laboratory under the guidance of Dr. Rama Gullapalli. My project is focused on hepatocellular carcinoma biology titled, "Understanding the role of heavy metal exposures as key drivers of hepatobiliary cancers in New Mexican populations." I joined UNM in the fall of 2021 as a graduate PhD student and came to this lab simultaneously as a research assistant.

I completed my master's from the Indian Institute of Technology (IIT), Jodhpur, India, in December 2020 in the department of Bioscience and Bioengineering. My research interests from the start were in cancer biology, so I joined the Inflammation and Tumor Biology laboratory at IIT Jodhpur during my master's as well. After completing my master's program, I was searching for a lab that could support me in enhancing my knowledge and allow me to do in-depth research in cancer biology. I hope my PhD degree will help me strengthen my scientific aptitude and troubleshooting skills in research. Getting a PhD is not a bed of roses. It requires ample patience, hard work, and a great mentor. Mentorship is the most crucial aspect of one's PhD degree. A mentor provides a specific direction with the proper scientific aptitude and nourishes students to shape them into great scientists. In this context, the Department of Pathology at UNM has a fantastic group of faculty experts in their respective areas.

I identified Dr. Gullapalli's lab, working on cancer biology, while I was searching for a PhD position. Working under the supervision of a physician-scientist gave me additional motivation to join his lab. My research will undoubtedly take wings at this excellent department. With my mentor's guidance, I hope to complete my PhD with flying colors. In addition, the world-class infrastructure of UNM and the available resources make this unique campus a great place to work. In my spare time, I love to play badminton and cricket and explore new places in New Mexico.



ANSHIKA MISHRA - GULLAPALLI LAB



My name is Anshika Mishra and I am a new graduate student in Dr. Gullapalli's lab. I got my Master's degree from India and moved to the USA in August 2022. I decided to join this lab because I had a keen interest in understanding molecular aspects of chronic diseases. I am excited to work on investigating the effects of long-term heavy metal exposure on human liver cells. During the course of my PhD, I intend to gain the skills and experiences which would help me towards a career in research. Outside of the lab, I like reading mystery novels, gardening and playing musical instruments.

ERIC BURNS - LIDKE LAB

I'm a PhD student in UNM's School of Medicine Biomedical Sciences Graduate Program in Diane Lidke's lab. I was attracted to Diane's lab by the lab's interdisciplinary approach to studying cancer through utilizing cutting-edge microscopy, biophysics, cellular biology, and computing methods to understand how and why oncogenesis occurs. Being in the Pathology Department has been outstanding with a multitude of opportunities to collaborate and directly interface with clinicians and other researchers.

I have been in Diane's lab for the past year and a half, where I have been studying the molecular dynamics of receptor tyrosine kinases (RTKs) such as the EGF-receptor and HER2 and their involvement in oncogenesis. My research involves imaging these receptors at the single-molecule scale through various imaging modalities, such as super-resolution microscopy, single-particle tracking and FRET-FLIM imaging to understand how these receptors organize and interact with each other, and how this may lead to aberrant signaling and cancer progression. Part of my work is to understand the dynamics of these receptors upon treatment of various clinically used antibodies in chemotherapy, and how we may design more effective therapies in the future.

My research career goals are to continue to keep studying how and why oncogenesis occurs at the cellular level, as well as to study how we may better treat cancer in the future, hopefully one day as a tenure-track professor! In my spare time, I enjoy traveling, playing music, hiking, exercising, and spending time with friends and family.



DEREK RINALDI - LIDKE LAB

My name is Derek Rinaldi and I am a 6th year PhD student in Diane Lidke's lab. I was initially excited about the type of work that our lab does involving single molecule interactions and nanoscale protein dynamics. However, I was more interested in how the answers were acquired, notably all the different high resolution microscopy techniques that she is famous for. Now I think I can say I am proficient in at least six different microscopes ranging from confocal microscopy to dSTORM super resolution and everything between. These skills allow me to study the signaling pathways and molecular mechanisms that govern the allergic response. More specifically, I am exploring: 1) the biophysical and nanoscale changes that the FcεRI receptor and signaling partners undergo to regulate activation, 2) The contribution that integrins add to the signaling pathway and to the secretion of allergy-causing granules, 3) The trafficking and secretion pathways of secretory granules and how the small GTPase Arf6 regulates those processes.

I enjoy asking questions in the immunology field, but what I really enjoy is helping others in my lab ask their questions and supporting their science. I want to leverage my, now extensive, knowledge of microscopes to help other labs use them properly. A Field Application Scientist position will allow me to be on the science front line, but in a support and teaching role.

Outside of lab time, as much as that exists as a PhD student, is devoted to building computers and anything I can do to be in the wilderness. I have been whitewater rafting since I was 5 years old and I find any excuse to be on a river. I grew up in Colorado and was a competitive swimmer, so I spent many winters on skis and the rest of my time in a pool. Essentially, water is a main theme in my life (otters are my spirit animal). All in all, I am ready to take my expertise and experience out into the world and help the next generations of scientists with their advanced microscopy.



TAYLOR USELMAN - BEARER LAB

When I began my search for potential research mentors after joining the Biomedical Sciences Graduate Program, one of the first professors I desired to meet was Dr. Elaine Bearer. Her cutting edge internationally recognized research fell in line with my interests. Our meeting quickly led to an interest in a research rotation where I worked with former lab members Drs. Christopher S. Medina (UNM BA-MD, 2020) and Daniel R. Barto (UNM ASERT Postdoc, 2019). Eventually our experience together led to my joining Dr. Bearer's lab to begin PhD research in Spring of 2019. After 4 years in her lab, my thesis developed into understanding "brain-wide neural signatures of stress," a significant health issue in New Mexico. We use an emerging neuroimaging technology called manganese-enhanced MRI combined with transgenics, neuromodulation, and advanced data analytics to map transitions in brain-states after adverse experiences. We further seek to elucidate roles of different brain systems in vulnerability to mental illness, such as mood and substance use disorders, and in Alzheimer's disease.

While an undergraduate student at New Mexico State University, my coursework focused on engineering-physics and biochemistry. I also gained neuroscience research experience as a scholar in the NIH's BP-ENDURE program. This program trains undergraduates for careers in neuroscience, specifically those from underrepresented backgrounds such as coming from a lower socioeconomic status in rural New Mexico as I did. This amalgam of undergraduate studies nourished my early interests in systems neuroscience and neuroengineering, which I now apply working with Dr. Bearer in the Department of Pathology. Throughout my undergraduate and graduate studies at New Mexico Universities, I have received world-class training that provides both confidence and tools to actively pursue my research goals, which are to develop technologies for investigating, diagnosing, and treating brain disorders.

Beyond research, I enjoy mentoring and training other students and being involved in public outreach and service projects. I am also completing a concurrent MBA at UNM to obtain managerial and technology transfer expertise for application to future research in academia or industry. I see each of these activities as a component of my professional and research ambitions. Outside of these professional interests, you are likely to find me hiking a New Mexican landscape or playing guitar!



MOHSEN RANJBAR - BEARER LAB

I am a member of Dr. Bearer's Lab. Unofficially, I started in January, with affiliation beginning in August 2022. As a pharmacist who aims to be a researcher in the field of biological/medicinal chemistry, I traveled from Iran because I was attracted by the productive Center for Molecular Discovery at the University of New Mexico. Due to the pandemic, my graduate studies were postponed from fall 2020 to the fall 2021 semester. Sadly, some of the key people, well-known scientific researchers of that center, such as Dr. Larry Sklar and Dr. Tudor Oprea left UNM just before I arrived here. Fortunately, I could still be connected to the people on



the north campus. Dr. Amir R. Nafchi, now an alumnus of the UNM Electrical and Computer Engineering program (PhD, UNM '22) and a former member of Dr. Bearer's lab introduced us and I became familiar with her research group. The research projects in Dr. Bearer's group are totally in line with my interests and very exciting to me. Addressing biological issues - particularly Alzheimer's Disease - using in silico tools is the main focus of my research here. I know that what I will learn from Dr. Bearer, which not only covers science but also contains great lessons for life and success, will help me become an extraordinary researcher who can assist people by addressing needs for accurate diagnosis and novel therapies.

It is a great honor to be a member of a lab where the supervisor is not only a brilliant scientist but also a magnificent musician because most of my free time is filled with music. I enjoy playing Spanish/flamenco guitar. Additionally, I am highly interested in reading books about the history and philosophy of science.

ERICA PASCETTI - GILLETTE LAB

My name is Erica Pascetti and I am a 5th year graduate student in the lab of Dr. Jennifer Gillette. I have worked in Dr. Gillette's lab for seven years, including one year as an undergraduate and one year as a post-bacalaureate. I choose to work in Dr. Gillette's lab because of the amazing mentorship I knew I would receive and because she was conducting outstanding research in hematology. I was also interested in the Pathology Department because it is one of the few departments that has both a clinical and research side. I knew that as a graduate student being able to experience clinical research and basic science research would be a unique and remarkable opportunity.

My graduate project is studying how the tetraspanin CD82 regulates quiescence of hematopoietic stem and progenitor cells (HSPCs). HSPCs are a rare pool of tissue specific stem cells that are maintained in a quiescence state. However, upon hematopoietic stresses, such as infection, radiation exposure or

myelosuppressive therapy, HSPCs are activated, but must return to quiescence to prevent exhaustion of the hematopoietic system. My project is to understand the mechanism of how HSPCs return to quiescence after stress because the ability to transiently modulate HSPC return to quiescence has the potential to extend the activation of HSPCs and significantly improve overall patient outcomes from hematopoietic stresses.

After completing graduate school, I hope to obtain a post-doctoral appointment, and eventually obtain a scientist position in the field of industry. When I am not in the lab I enjoy walking with my dogs, reading or listening to books and podcasts, as well as watching movies with my husband, Johann.



SEBASTIAN RESTREPO CRUZ - GILLETTE LAB

My name is Sebastian Restrepo Cruz and I am a PhD Candidate in the laboratory of Dr. Jennifer Gillette. During my first year in the Biomedical Sciences Graduate Program, I rotated in several departments at the UNM Health Sciences Center. I found that the interdisciplinary nature and collaborative atmosphere of the Pathology Department would be an excellent fit for my PhD studies, and in June 2018, I joined the Gillette Lab.

My research focuses on the fundamental processes governing cell signaling, particularly the mechanisms that impact molecular organization and signal transduction at the plasma membrane. To address this question, my studies utilize super-resolution microscopy techniques to identify organizational changes in integral membrane proteins. Specifically, we are interested on the impact of the tetraspanin CD82, a membrane scaffolding protein, on the spatial organization and activity of the Epidermal Growth Factor Receptor (EGFR), a key cell surface receptor that has been implicated in numerous developmental processes, as well as several disease states. Importantly, our studies show that expression of CD82 alters the organization of EGFR on the plasma membrane and is associated with significant changes in EGFR signaling, suggesting that CD82 may be a promising target for the treatment of EGFR-related diseases. In the future, I hope to use the skills I have acquired to further develop methods and techniques to study molecular interactions at the nanoscale.

In my spare time, I enjoy bird watching and going on hikes around the bosque with my wife, Rina, and our pup, Hazel.



Faculty News & Awards

NEW FACULTY



AYSHA MUBEEN, MD

Visiting Assistant Professor, Anatomic Pathology, Sept. 1, 2022



AUDRA KERWIN, MD

Assistant Professor Clinician Educator, OMI, Feb. 1, 2023

FACULTY RETIREMENTS

I-MING CHEN, PhD

Research Professor, Comprehensive Cancer Center, Oct. 1, 2022



RICHARD LARSON, MD, PhD

Professor & Vice President of Research, Health Sciences Center, Jan. 15, 2023



NEWS & AWARDS



DR. JENNIFER GILLETTE

The School of Medicine, Office of Academic Affairs and the Regents' Awards Selection Committee has awarded Jennifer Gillette, PhD, with the Regents' Lecturer Award for 2022. Regents' Lecturer is a special title bestowed on selected tenured faculty members who, in the judgment of the Dean and on the advice of a faculty selection committee, merit recognition of their accomplishments as teachers, scholars and leaders both in university affairs and in their national/international professional communities. Congratulations to Dr. Gillette on receiving this award and thank you for your remarkable contributions to the Department of Pathology and the School of Medicine..

DR. LARRY SKLAR

Larry Sklar, Ph.D., Distinguished Professor Emeritus of Pathology, was inducted into the Associated Alumni of Central High School Hall of Fame along with other notable inductees in October 2022.

Central High School, where Dr. Sklar attended high school in Philadelphia, Pennsylvania, dates to 1836 and is the second oldest high school in the country. There have been 20 Hall of Fame Induction Ceremonies for a total of 137 inductees. The MC for the ceremony was the author Quiara Alegria Hudes. She wrote the Pulitzer Prize-winning book *In the Heights* which became the musical by Lin Manuel Miranda and a film. Also inducted at this time were Cristin O'Keefe Aptowicz (*Mutter's Marvels/Poetry*), Shawn Gee (*Music/Entertainment*), Major Jackson (*Poet*), Michele Hangley (*Law/Judge*), Hankus Netsky (*Musicology/Musician*), James Taubman (*Comic Books/Magazines*), and Stephen Werblun (*Art/Movies*).

Dr. Sklar was nominated for this honor based on his contributions as an inventor of new medical technologies. He has inventions in the areas of signal transduction, cell adhesion, leukocyte biology, and high-throughput technologies for molecular assembly and drug discovery. His interest in flow cytometry as a tool for drug discovery led to the development of high-throughput flow cytometry technologies and their applications to drug discovery for several diseases resulting in several startup companies. For example, the inventions formed the basis of University of New Mexico Lobo Rainforest start-up IntelliCyt Corporation, a company that Dr. Sklar co-founded to develop the HyperCyt® System sample handling technology that allows flow cytometers to screen biological samples in suspension 30-40 times faster and with greater accuracy and cost efficiency than conventional approaches. In July 2016, the company was sold to international biotech company Sartorius AG for \$90 million, representing the largest acquisition to date of a local startup company spun out of UNM. The company continues to operate independently at its Albuquerque-based facility as a Sartorius company.

For over twenty years, Dr. Sklar has dedicated himself as an inventor to making high-throughput flow cytometry the benchmark for flow cytometry technology. For nearly as long, as the director of the Center for Molecular Discovery, he has helped to make New Mexico internationally known as a hub for flow cytometry research and technologies. HyperCyt-based systems are now finding their way into mainstream screening labs. In doing this, he everywhere to discover more treat cancers, infectious diseases, applications, and built multiple along the way that are reflected in commercialization activity. These election as a fellow of the the American Institute of Medical

has given a tool to researchers effective ways to understand and and many other biological teams of inventors and innovators his patent portfolio and contributions have led to his National Academy of Inventors and and Biological Engineering.



Dr. Sklar was researched by classmate Steven Shapiro, father of the new governor of Pennsylvania, Josh Shapiro.

THE MARCHETTI LAB

Dr. Dario Marchetti's laboratory, along with colleagues at UNM-CCC and UNM-HSC, has published a ground-breaking manuscript in Cancer Research Communications centered upon the discovery of a melanoma Circulating Tumor Cells (CTCs) signature associated with brain metastasis. The paper was also selected for a newsletter and feature article [Bowley T et al., Cancer Research Communications, 2(11), 1436-44, 2022].

Because Melanoma Brain Metastasis (MBM) is linked to poor prognosis and a very low overall patient survival, Dr. Marchetti hypothesized that melanoma CTCs possess a gene signature significantly expressed and associated with MBM. Employing multi-pronged and complementary approaches involving clinical samples, distinct stages of melanoma progression, longitudinal monitoring of CTCs, spatial and temporal onset of MBM, and pre-clinical models, his lab has provided first-time evidence identifying a common CTC gene signature for ribosomal protein large/small subunits (RPL/RPS) which directly associate with MBM onset and progression. Experimental strategies involved capturing, transcriptional profiling and interrogating CTCs, either isolated from blood of melanoma patients or from CTC-driven MBM in experimental animals. Furthermore, Marchetti's lab and colleagues developed the first magnetic resonance imaging (MRI) CTC-derived MBM xenograft model (MRI-MBM CDX) to discriminate MBM spatial and temporal growth, recreating MBM clinical presentation and progression. Lastly, they performed the comprehensive transcriptional profiling of MRI-MBM CDXs, along with longitudinal monitoring of CTCs from CDXs possessing/not possessing MBM.

These findings have high translational relevance because they suggest that an enhanced ribosomal protein content and/or ribogenesis can contribute to MBM onset, regardless of the model employed or sample source. Because ribosome modifications drive tumor progression and metastatic development by remodeling CTC translational events, overexpression of the CTC RPL/RPS gene signature could be implicated in MBM development. In summary, this study provides important insights fostering relevance of the CTC RPL/RPS gene signature in MBM, and to identify potential targets for therapeutic intervention to predict and/or to prevent clinical MBM, e.g., to improve patient care for melanoma patients diagnosed with or at high-risk of developing MBM.

Click to view: ["The RPL/RPS gene signature of melanoma CTCs associates with brain metastasis"](#)

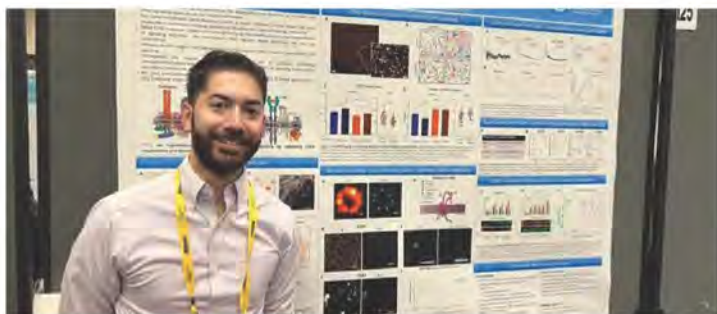


Graduate Student News

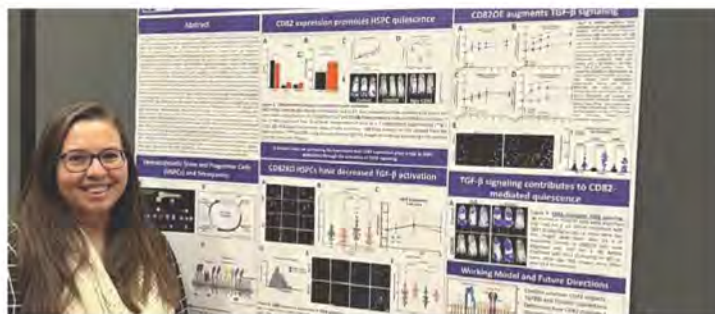
GILLETTE LAB ACCOLADES

UNM Pathology was well represented at the American Society for Cell Biology meeting held in Washington, DC, in early December. Special congratulations go out to Gillette lab graduate students **Sebastian Restrepo Cruz** and **Erica Pascetti** for receiving Minority Affairs Committee Travel Awards to attend the meeting and present their work. Both students presented their work at two separate poster sessions and Erica received an outstanding poster award prize for her presentation.

Additionally in December, the American Society for Hematology (ASH) meeting was held in New Orleans, LA, which leads us to a second congratulations to graduate student **Erica Pascetti** for her presentation which received an ASH Abstract Achievement Award.



Sebastian Restrepo Cruz.



Erica Pascetti .

RESEARCH DAY WINNERS



Elizabeth Bailey

Congratulations to Gillette Laboratory Research Assistant **Sebastian Restrepo Cruz**; and Wandinger-Ness Laboratory Post Doctoral Fellow **Elizabeth Bailey** for being presented with the Judges' Choice awards for their current research and scientific discoveries at the annual Comprehensive Cancer Center's Research Day November 29/30 event!

Sebastian Restrepo Cruz "Tetraspanin CD82 Regulates Epidermal Growth Factor Receptor Signaling by Modulating Molecular Organization and Dynamics"

Elizabeth Bailey, PhD "Dissecting the TCR/CD28/PD-1 signaling axis using single molecule pull-down (SiMPull)"

Resident and Fellow News

NATIONAL PRESENTATIONS

Accolades to the Pathology residents who presented posters at the 2022 CAP Annual Meeting in New Orleans, Louisiana. "An Aggressive and Advanced Stage Encapsulated Papillary Breast Carcinoma in a Male" authored by **Mary M. Torrez, MD**; Michaela L. Granados, BS; Stephanie Fine, MD; Jain Zhou, MD, PhD; & Nadja K. Falk, MD. "Distinction of Tumor Heterogeneity from Synchronous/Collision Tumors in Lung



Mary Torrez



Martika Percy

Biopsies Using Targeted NGS Panel: A Retrospective Study" authored by **Mary Torrez, MD**; Michaela Granados, BS; Khalil Sheibani, MD; Mohammad A. Vasef, MD. "An Unusual Rectal Smooth Muscle Tumor Arising from the Muscularis Mucosa" authored by **Megan Gage, DO**; David Martin, MD; Joshua Hanson, MD.

Martika Percy, MD, PGY-2 resident, presented her hematopathology case study, titled "An Unusual Extramedullary Presentation of an NPM1-Mutated Acute Myeloid Leukemia (AML) in a Young Adult" at the American Society for Clinical Pathology (ASCP) 2022 meeting held from September 7-9, in Chicago, IL. **Jordan Redemann, MD**, (Hematopathology fellow) was also a co-author on the study.



Megan Gage



Jordan Redemann

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If you need assistance with your gift please contact:

Maggie Schold, MFA, Director of Development, UNM School of Medicine

Mobile: (505) 259-9164 or Email: maggie.schold@unmfund.org

Acknowledgements

The University of New Mexico Department of Pathology gratefully acknowledges Nancy Risenhoover for the layout of this newsletter.

For more information on our department, please visit our website:

<https://hsc.unm.edu/medicine/departments/pathology/>

Do you have news? Please share! Contact: HSC_PathAdmin@salud.unm.edu