

**WINTER 2021**

*Path*FINDER



Welcome to this fall/winter installment of *PathFINDER*, our departmental newsletter where we connect you to the latest in UNM Pathology notable events. As we enter our second year of the COVID-19 pandemic, this issue has several feature articles spotlighting some of the COVID-19-related work undertaken by our faculty, essential in UNM's efforts to take care of our patients afflicted by the virus. Dr. Kendall Crookston tells of his week working on UNMH's COVID-19 inpatient service and Dr. Jay Raval reports on some of the COVID-19 clinical trials ongoing in our Transfusion Medicine and Therapeutic Pathology group.

In recognition of Dr. Larry Sklar's retirement last fall and his career-long achievements, we highlight his time as Director of the Center for Molecular Diagnostics. This feature tells the impressive history of the CMD through the eyes of Dr. Sklar, as well as from a number of his esteemed CMD colleagues through the years.

Our department lost one of our Pathology resident team with the sudden passing of Dr. Maryam Sayah. Maryam finished her residency with us in 2020 and had commenced a hematopathology fellowship at UCLA. She was an engaging and kind colleague and always had a smile. She is truly missed. Our deep condolences to her family.

As we move further into 2021, we are clearly not done with COVID-19 and the need for continued strong vigilance in prevention measures. I wish all of you perseverance with the challenges and continued safety and good health.



Please follow us on [Facebook](#), [Instagram](#) and [Twitter](#).

NANCY JOSTE, MD  
Professor & Interim Chair of Pathology

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Cover image: The construction for the new UNM Hospital tower has begun! Many of you may have experienced detours as construction is focusing on the new parking structure first. Please be sure to check for updates on this project through regular UNMH communications.



## FEATURE

### TRANSFUSION MEDICINE AND THERAPEUTIC PATHOLOGY

BY JAY S. RAVAL, MD, ASSOCIATE PROFESSOR

Transfusion Medicine and Therapeutic Pathology here in the Department of Pathology is proud to be participating in multiple trials and is actively leading many of these here at UNM.

From the SARS-CoV-2 convalescent plasma perspective, our department is leading three trials (CSSC-001 and CSSC-004 for outpatients, and PassItOn for inpatients) and partnering with Emergency Medicine on one (C3PO for ED patients). These trials are all randomized controlled trials using high-titer SARS-CoV-2 convalescent plasma vs. placebo (either regular plasma or vitamin water) and are funded by the DoD, NIH, and/or NHLBI. A big thanks to our TriCore blood bank staff, particularly Cindy Jones and Eileen Sierra, for helping with this.

When considering other therapies for treating COVID-19, our department onboarded and led the first COVID-19 related trial here at UNM — the novel cytokine removal column for severe COVID-19 in ICU patients. Novel mechanisms for performing plasma exchange to increase nurse operator safety were developed during this trial by our UNM team which is now being used nationwide. UNM was able to recruit 9 patients (out of a total of 50 at 4 centers nationwide) into this trial. A huge shout-out to the entire apheresis nursing team for being on the front-lines and treating these patients.

Of course, COVID-19 trials aren't all that's happening these days. Our department is leading the MINT study, a randomized trial of RBC transfusion in anemic patients with acute myocardial infarction and transfusing at hemoglobin thresholds of 8 vs. 10 g/dL. The APACHE study will soon be activated, and this trial will also be a randomized controlled trial for treating acute-on-chronic liver failure patients with either standard of care treatments vs. standard of care treatments + plasma exchange.

Numerous projects with Coagulation and Critical Care Medicine are ongoing, including multi-center analyses of transfusion data in various ill and/or bleeding patient populations, and the Hemopure "artificial blood" made from bovine hemoglobin for those patients who refuse traditional RBC products.

Lastly, from the basic science perspective, UNM and our department have partnered with TransImmune, a company that has created a table-top version of the extracorporeal photopheresis device, to explore the many questions related to photopheresis mechanisms of action and efficacy in tumor killing and immune modulation.

If anyone wants to have a look at an instrument with an active nuclear radiation source that is safely housed here at the UNMH Blood Bank, please ask any of the Transfusion Medicine and Therapeutic Pathology faculty members for a tour of the blood product irradiator! Time to view this important item is flying fast as our current irradiator will eventually be replaced with an X-ray irradiator with much less risk, oversight, and expense associated with it.

On a final note, Dr. Joseph Griggs of our Transfusion Medicine team, has been instrumental in the successful accreditation of SRMC as a Level 3 Trauma Center. Dr. Griggs has also been active in developing a UNMH Neonatal Massive Transfusion Protocol to ensure consistent and efficient care for our massively bleeding newborns.



Above: Michon Santos, RN and Sarah Mertens, RN, two nurses in our Apheresis Unit, who are holding the first therapeutic apheresis column to be used in the state of NM this century (and possibly ever). This particular column was used to treat a patient in the UNMH MICU with severe COVID-19 sepsis as part of the first COVID-19 clinical trial here at UNM that led by Pathology and Medicine (Jay S. Raval - PI, Michelle S. Harkins, Co-I). All of our other nurses, including Chelsea Reyes, Margaret Prizzi, and Cynthia Ornelas (not pictured), also went to the front-line to provide direct care to these critically ill patients with COVID-19.

## FEATURE

### ON BECOMING AN INPATIENT COVID SERVICE ATTENDING

BY KENDALL CROOKSTON, MD, PHD, FCAP, PROFESSOR

In the Spring of 2020, the UNM Department of Pathology was asked to provide faculty for the UNMH COVID inpatient expansion contingency plans. A number of our pathology faculty volunteered for this duty. I volunteered to be among the first, since Transfusion Medicine physicians see patients regularly and are at least acquainted with Powerchart, TigerConnect, and the other aspects of inpatient care. I also imagined that it would be difficult for my colleagues that were not very familiar with Powerchart and hadn't done any direct patient care in years to get up to speed fast enough to cover for just a week or two of service.



Luckily, New Mexico “flattened the curve” and Pathology faculty were not needed—that is, until the COVID resurgence last Fall. When I read the second email request for volunteers, I hit “respond to sender” and was about to explain that I couldn't do it because I was retiring and my family had already moved out of state—but I didn't finish the email. That night I thought more about how I wanted to spend my last full-time patient care days.

I would have been very “comfortable” spending my last days covering my own Transfusion Medicine/Apheresis service—I had been doing that work for over 20 years—it would be easy. However, I wondered if being “comfortable” my last week was what I wanted. A quotation from Lord of the Rings popped up in my mind that summarized the pandemic for me:

*FRODO: “I wish it need not have happened in my time.”*

*GANDALF: “So do I, and so do all who live to see such times. But that is not for them to decide. All we have to decide is what to do with the time that is given us.”*

The next day I responded that I would like to cover. My Pathology colleagues graciously covered my scheduled pathology service time so that I could be an attending on the Zinc Medicine 5 Covid Team, which consisted of three independent practitioners—a family medicine attending, an experienced physician assistant, and myself (no residents).

We averaged about 15 patients on our service that week—some of them were on high flow oxygen which would normally have landed them in the ICU, one of them was moved to comfort care that week. After visiting a few patients with the other clinicians on the first day, I fell into the 7 a.m. to 7 p.m. pace of caring for my own patients. The best analogy that I can think of is like the old television show Fantasy Island, where guests get to live out their dream for a week—I got to be a “real” inpatient physician for a week.

Nearly the entire day consisted of seeing my patients and doing computer work and making sure all of the testing and medications and discharge plans were happening. Oxygen requirement was a key indicator of whether we could send patients home—or to the “COVID” hotel that provided rooms and meals for patients that couldn't go home—or to the re-opened hospital on Gibson that could take care of “stable” patients that came with their own medications and that were on less than 4 liters of oxygen (we preferred to get them down to 2 liters before sending them out). Most of my patients were on 6th South and 4 East. The windows of rooms on both floors had been removed and a noisy blower system pushed air out through the opening to create a negative pressure. The noise made listening to heart and lung sounds difficult—which was not helped by using the disposable stethoscope in each room. When opening the main door to a unit, with 17 of these fans sucking the air out, it seemed like gale force winds as the air was sucked in.

The first day I discovered that some of the 6th south nurses remembered me from taking care of apheresis patients on that floor—that took the edge off my nervousness. In order to conserve PPE, only new patients (and patients that had “issues”) would get a hands-on physical exam inside their room. Usually, the visits consisted of me looking through the door window at them sitting up on their bed and them looking out at me—while communicating with each other by phone.

Of course, I was constantly asking my VERY patient and helpful colleagues for advice regarding writing discharge orders or for which was the best medication for \_\_\_\_\_ (fill in the blank). All of the support staff were VERY helpful also. However, I felt comfortable with some things: For instance, I had one patient who had baseline hypercoagulability and after getting COVID-19 he clotted off his upper extremity and needed anticoagulation. An older male patient had severe iron deficiency anemia refractory to oral iron and I was able to give IV iron (and put in a referral for an outpatient GI doctor to scope him). One mother of young children couldn't sleep because she was afraid she would stop breathing if she did, and so we discussed—and treated—her short-term anxiety. Another patient had a 30-year history of schizophrenia and was anxious about the COVID diagnosis—I am comfortable sitting down and taking the time to understand and reassure people with mental illness.

In summary, my week as a real inpatient physician wasn't “fun” but it was an “enjoyable” experience. However, it also reinforced the fact that I have never regretted my decision to become a pathologist!



## FEATURE

### REFLECTIONS ON THE CENTER FOR MOLECULAR DISCOVERY

INTERVIEW BY WILLIAM F. COLLINS, MFA

The UNM Center for Molecular Discovery (CMD) was created in 2005. The CMD provides industry standard molecular screening services that enable investigators to perform chemical biology discovery research in their areas of basic and translational research interests. The center operates as a collaborative resource with a mission to support discovery by designing, optimizing, running large scale screens, and confirming obtained actives. We interviewed former director Dr. Larry Sklar and colleagues about their experience with center.

## LARRY SKLAR, PHD

FORMER DIRECTOR, CMD, PROFESSOR EMERITUS, DEPARTMENT OF PATHOLOGY



#### NOW THAT YOU ARE SEMI-RETIRED, CAN YOU REFLECT ON YOUR WORK WITH THE CMD AND HOW IT FITS INTO YOUR CAREER WITH UNM PATHOLOGY?

Although my scientific expertise is in cellular signal transduction and cell adhesion in normal and diseased cells, particularly leukocytes, my background in biotechnology and the physical sciences melded these in high throughput flow cytometry (HTFC) to evaluate molecular and cellular interactions in suspension. Over the last two decades, our HTFC invention with Dr. Bruce Edwards and Fritz Kuckuck has contributed to the discovery of

novel molecules or repurposed with potential in the treatment of diseases. Several of these discoveries have been translated to clinical interventions that have been tested in pre-clinical animal models and then in human early phase clinical trials in the UNM Comprehensive Cancer Center. With Drs. Eric Prossnitz, Tudor Oprea and others, we identified novel agonists and antagonists to the novel, membrane-bound immediate early receptor and signaling protein for estrogen, GPER. Through testing in model systems and clinical trials, these compounds are showing efficacy in the treatment of cancer and diabetes. With Dr. Angela Wandinger-Ness, Tudor Oprea, and others we identified several activators and inhibitors of GTP-binding proteins in the RAS family that are being tested in model systems and humans as agents for cancer prevention and therapeutic intervention.

#### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

We introduced high throughput flow cytometry (HyperCyt) as a technology for drug discovery, patenting applications of the technology. While the academic mission has traditionally involved research and education it now spans technological innovation, discovery, translation and commercialization. The high throughput flow cytometry platform for drug discovery has been associated with multi-target screening for both cellular and molecular targets such as efflux transporters, integrins, GPCRs, and GTPases, as well as protein-protein, and DNA-protein interactions. These have been accompanied by repurposing screens in association with the NIH Molecular Libraries Program, the UNM Comprehensive Cancer Center, and the UNM Clinical and Translational Science Center through the Drug Repurposing Network. Kinetic measurements in flow cytometry have provided insight into small molecule mechanism of action. Experimental and computational methods have led to the identification of small molecules as first in class chemical probes, leads for drug discovery, and repurposed drugs. These molecules and technologies have been described in several hundred publications and 46 patents, and have contributed to several clinical trials and start-up companies. Promising results have been shown in infectious, metabolic, and cardiovascular diseases as well as cancer. We envision future repurposing contributions to personalized medicine. The technology is now commercially available worldwide, with additional applications in antibody discovery and immuno-oncology.

#### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS ASSOCIATED WITH CMD?

The identification of novel drugs depends upon the rapid analysis of thousands to millions of small molecules. At the time when our team began developing high throughput screening approaches in 1999 in advance of CMD, flow cytometers analyzed 1-2 samples per minute by manually placing sample tubes on the instrument. The innovations led to instruments that could analyze a sample in 1-2 seconds. The technology was termed HyperCyt® and led to the creation of a new company, IntelliCyt Corporation, which developed and commercialized the novel cell screening platform that assesses multiple cellular parameters with speed, efficiency, and ease of use. In 2016, IntelliCyt Corp. was sold to international biotech company Sartorius AG for \$90 million, representing the largest acquisition of a local startup company resulting from commercialized UNM technologies. With several hundred people worldwide, Sartorius maintains a major R&D site in Albuquerque. In addition to the discovery and development of the instrumentation platform itself, collaborative work employing this technology to identify novel small molecules has contributed to the creation of startups including Revere Pharmaceuticals, with the goal of treating ovarian cancer, and, Linnaeus Therapeutics and GPER G-1 Development Group, targeting treatments for cancer and metabolic disorders, respectively, as noted above, with the small molecules that modulate the activity of the novel estrogen receptor GPER.

#### HOW HAS YOUR EXPERIENCE WITH THE CMD INFLUENCED YOUR CAREER AND/OR YOUR CAREER PATH?

UNM Center for Molecular Discovery (CMD) was created in 2005. As Director, I collaborated on screens with investigators at UNM, and across the nation and the world representing dozens of biological targets for drug



discovery and development. Our collaborative approach has contributed to a portfolio of new and repurposed compounds that in turn has resulted in therapeutic technologies with commercial potential. I also had the opportunity to contribute to education and training programs, and mentorship, to students and faculty not only in CMD but also in UNM's Faculty Entrepreneurs Network, and training programs of the NSF-funded I Corps Center and the EDA-funded New Mexico Rainforest University Entrepreneurial Training Center.

I have learned from these activities that: 1) technology matters because innovation leads to discovery; 2) you shouldn't get hung up on to your last good idea since your next one will be better; 3) missed opportunities are not necessarily lost opportunities since when you are patient, things usually come around again; 4) it is possible to be in a field too early but If you build something worthwhile, support will follow.

From the perspective of people, I learned: 1) relationships matter because it's all about the people; 2) to be inclusive, to avoid errors of omission, and not to fret about errors of commission; 3) to acknowledge team members and celebrate their success; and 4) to treat your team like your family. Moreover, 5) since each team has a unique personality, communicate, take nothing for granted, close the loop, encourage dissent, and learn from trainees. 6) Since teams evolve, lead and follow graciously

The experience also taught me that: 1) life, like research, requires experiments...and drama; 2) there is a threefold path - things that work as expected, things that never work, and things that work unexpectedly; 3) because in a technology community, relationships evolve among colleagues and competitors, don't burn bridges; 4) leave a legacy by spinning off new teams, facilitating your successors and building infrastructure. Thinking globally and acting locally is an antidote to anonymity that can impact your colleagues positively every day. Perhaps most importantly, identify where your colleagues are going and help them get there.

#### WHAT ARE YOUR FAVORITE MOMENTS?

Innovation was something that I recognized as a team process, something I came to appreciate from my time at Scripps with my research mentor, the pathologist Charles G. Cochrane, MD. Building and working with diverse teams of different sizes provided great satisfaction. I had the opportunity to contribute to local (e.g. CTSC, Cancer Center, and AIM COBRE) as well as national and international initiatives. The UNM Innovation Center (Lobo Rainforest) events made it possible to celebrate team contributions and to interact with a spectrum of innovators. I was able to travel around the world to meet colleagues and collaborators in fascinating places.

## ANGELA WANDINGER-NESS, PHD

PROFESSOR, DEPARTMENT OF PATHOLOGY

#### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

The Center for Molecular Discovery (CMD) at the University of New Mexico is a community of engaged and collaborative individuals committed to research excellence. CMD is an integral part of our community through participation in supporting members of all major Centers at UNM HSC; including the Clinical and Translational Science Center, two Centers of Biomedical Research Excellence (Autophagy, Inflammation and Metabolism; UNM METALS), and the Comprehensive Cancer Center's Clinical Therapeutics and Translational Science initiatives. What makes CMD a stand-out is its commitment to engaging and recruiting the community to the interdisciplinary possibilities afforded by the CMD.

#### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS WORKING WITH THE CMD?

One of the accomplishments I am most proud of is in the course of our 15+ year collaboration is making the scientific community take greater note of GTPase enzymes as druggable targets for both research and clinical applications. When we started, Ras the famous founding member of small molecular weight GTPase family, while recognized as an important oncoprotein in cancer had been deemed undruggable by most pharmaceutical companies. Only in 2020 and 40 years since Ras was identified, did the first KRas inhibitors in the clinic show preliminary but promising safety efficacy. We and others extended the thinking of targetable GTPases to Rho and Rab family GTPases that control cell motility and the shuttling of cargo to appropriate destinations inside and outside the cell. Additionally, because we invested in identifying off-patent drugs with activity against GTPases, we were able to demonstrate clinical benefit in humans a project that we continue to pursue.



Above: Jacob Agola, PhD; Wandinger-Ness; Soumik BasuRay, PhD; Elsa Romero, BS—All part of my team leading GTPase discovery efforts

#### HOW HAS YOUR EXPERIENCE WITH THE CMD INFLUENCED YOUR CAREER AND/OR YOUR CAREER PATH?

The Center for Molecular Discovery (CMD) under the direction of Dr. Larry Sklar enabled me to turn my entrepreneurial skills as a scientist towards clinical translation. Having worked on GTPase enzymes for decades in the context of gaining mechanistic understanding of cell biology, kidney disease, and cancer, I wanted to innovate and do something patient relevant. Through consultation with Dr. Sklar, I procured NIH R03 and R21 awards that enabled us to conduct high throughput flow cytometry screens of over 300,000 novel compounds and Prestwick libraries of off-patent drugs. This interdisciplinary and collaborative effort included many faculty, trainees, and staff members\*, across the institution and beyond. It led to a clinical trial in ovarian cancer patients, 15 peer-reviewed publications, new grant awards, 7 awarded patents related to our GTPase and drug discovery work, as well as a licensing agreement with a Pharmaceutical start-up company. With team member Dr. Tione Buranda, I continued to pursue the role of GTPases as read-outs for disease and therapeutics, successfully competing to participate in



the National Science Foundation's -Innovation Corps training program and making a "Go-decision". Most recently, Dr. Buranda and I partnered with Elroy SPAC, led by CEO John Chavez, and Dr. Stephen Young (TriCore Reference Laboratories) in the submission of a small business grant in support of using our technologies for rapid decision making in the treatment of life threatening infectious diseases. Thus, the CMD was foundational to our being able to translate discovery science to patients and improved clinical care.

\*Sarah Adams, MD; Harold Ames, BS; Jacob Agola, PhD; Jeffrey Aubé, PhD (UNC); Soumik BasuRay, PhD; Kathryn (Charlie) Brayer, PhD; Cristian Bologna, PhD; Virginie Bondu, BS; Tione Buranda, PhD; Mark Carter, MS; Sharon Campbell, PhD (UNC); Alexandre Chigae, PhD; Daniel Cimino, BS; Linda Cook, PhD; Dayna Dominguez, BS; Bruce Edwards, PhD; Terry Foutz, BS; Zhanna Galochkina, MS; Matthew Garcia, BS; Jennifer Gillette, PhD; Jennifer Golden, PhD (Univ. WI); Kristine Gouveia, BS; Martha Grimes, PhD; Yuna Guo, PhD; Mark Haynes, PhD; Helen Hathaway, PhD; Brian Hjelle, PhD; Lin Hong, PhD; Laurie Hudson, PhD; Huining Kang, PhD; Li Luo, PhD; S. Ray Kenney, PhD; Donna Kusewitt, DVM; Christine Murray-Krezan, PhD; Carolyn Muller, MD; Tudor Oprea, MD, PhD; Charuta Palsuledesai, PhD; Amanda Peretti, MS; Genevieve Phillips, MS; Rytis Prekeris, PhD (Univ. CO); Eric Prossnitz, PhD; Melanie Rivera, PhD candidate; Teresa Rutledge, MD; Elsa Romero, BS; Virginia Salas, PhD; Samantha Schwartz, PhD; Peter Simons, PhD; Jake Strouse, PhD; Scarlett Swanson, BS; Zurab Surviladze, PhD; Mathewos Tessema, DVM, PhD; Oleg Ursu, PhD; Anna Waller, PhD

#### WHAT ARE YOUR FAVORITE MOMENTS?

My favorite moments are taking time with friends and colleagues in the CMD to celebrate birthdays, holidays and achievements as a community and extended family.

## BRUCE EDWARDS, PHD

RESEARCH PROFESSOR EMERITUS, DEPARTMENT OF PATHOLOGY

#### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

From the very outset of its original establishment as the New Mexico Molecular Libraries Center, the CMD stood out from the other NIH Molecular Libraries Initiative Centers with respect to its unique technological drug discovery capabilities. The patented high throughput flow cytometry screening platform pioneered in the CMD enables a multiplexed screening approach to accomplish in one round of compound screening what requires multiple separate rounds in other conventional centers. Also outstanding is the availability of world class computational chemistry expertise to provide complementary theoretical modeling and in silico screening capabilities. Moreover, as an integral part of an academic community, the CMD provides unique learning opportunities for and benefits from interactions with a stream of highly motivated graduate students, research scientists and clinicians.

#### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS WORKING WITH THE CMD?

Perhaps the biggest accomplishment has been the progressive development and implementation of the hardware and software elements underpinning the CMD HyperCyt high throughput flow cytometry screening platform. This led to co-founding of a company, IntelliCyt, that has subsequently manufactured and placed advanced high throughput flow cytometry instruments in universities, pharmaceutical and biotech companies worldwide. Another accomplishment has been the identification and patenting of a series of high affinity compounds that are selective agonists and antagonists of two members of the formylpeptide receptor family. Interactions of these receptors with

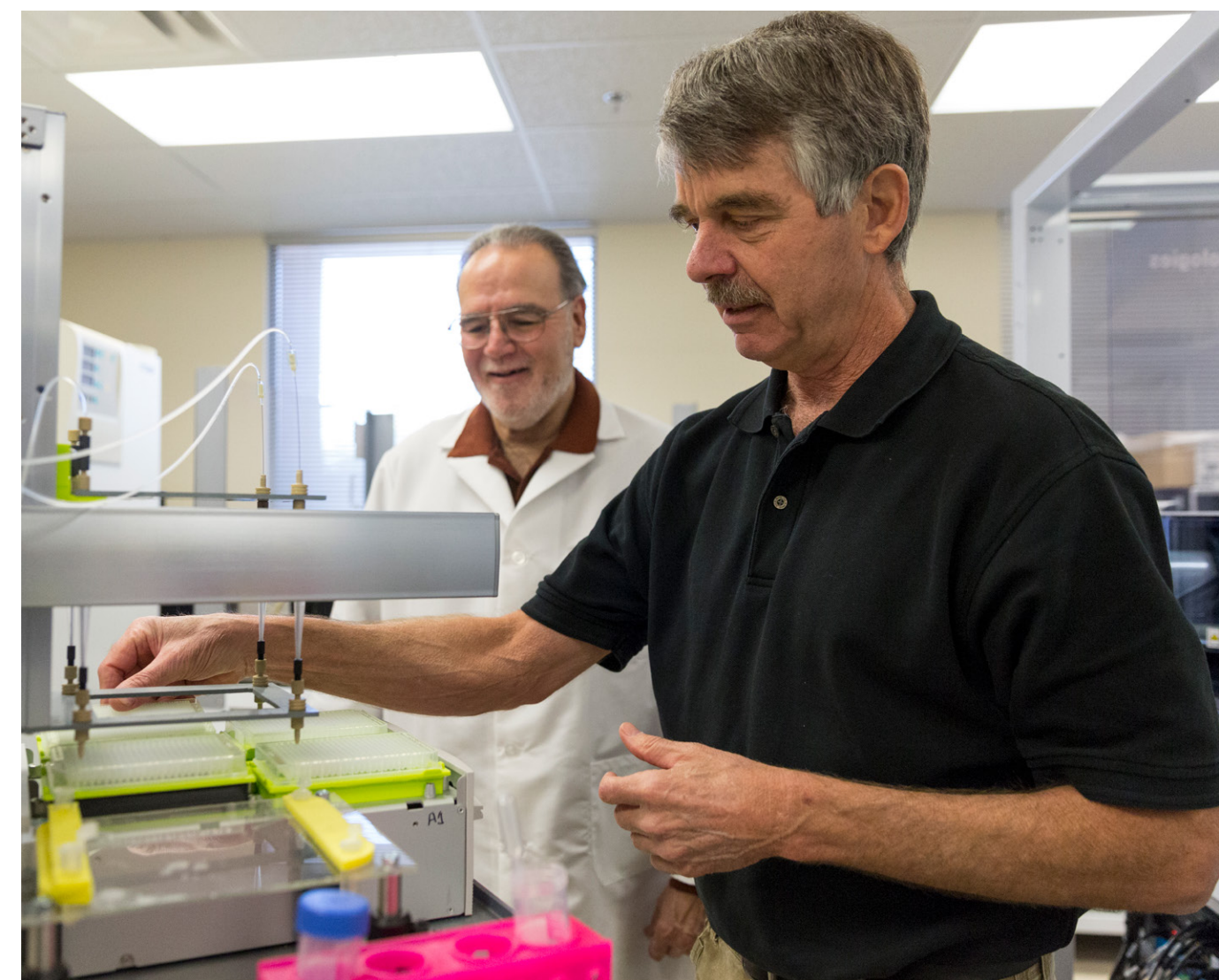
endogenous ligands have been implicated in the pathophysiology of several neurodegenerative diseases including Alzheimer's disease and Parkinson's disease, as well as neurological cancers such as neuroblastoma and glioma.

#### HOW HAS YOUR EXPERIENCE WITH THE CMD INFLUENCED YOUR CAREER AND/OR YOUR CAREER PATH?

Work in the CMD has been the major focus of my career since the original establishment of the CMD in 2005 as a member of the NIH Molecular Libraries Consortium. In addition to my role in technology development, I have led multiple NIH-sponsored compound screening campaigns. I have been fortunate to have contributed to 18 patents for novel compounds of therapeutic potential and technologies developed in the CMD. Of particular importance to my career development in the CMD up until retirement has been the unwavering support of the CMD Director, Dr. Larry Sklar, and the privilege of working with the highly talented and collegial group of individuals whose efforts have been integral to the ongoing success of the CMD.

#### WHAT ARE YOUR FAVORITE MOMENTS?

Perhaps my fondest memories are of the annual CMD group lunches that were convened just before Christmas at Taj Mahal over a period of many years. Other favorites in early CMD years were the annual gatherings in which each center of the NIH Molecular Libraries Consortium, a different one each year, would host members from the other centers for facility tours and a banquet.



## ERIC PROSSNITZ, PHD

DISTINGUISHED PROFESSOR, DEPARTMENT OF INTERNAL MEDICINE, DIVISION OF MOLECULAR MEDICINE

### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

The Center for Molecular Discovery (CMD) at the University of New Mexico was created and developed as a collaborative effort among a group of UNM faculty, each providing their unique expertise for the advancement of the center, under the leadership of Dr. Larry Sklar. The outreach of the CMD to local, regional and national faculty led to its success in many areas.



### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS WORKING WITH THE CMD?

I have collaborated with Dr. Sklar at UNM for over 23 years, from the beginning of the technology development that would lead to the CMD as a co-I of a funded Bioengineering Research Partnership grant in 1999. I was also fortunate to be a co-I of the Molecular Libraries Screening Center beginning in 2005. Through these interactions, we screened compounds for those that might target the G protein-coupled estrogen receptor GPER. This led to the identification of GPER-selective agonists and antagonists. These discoveries have led to numerous patents, the creation of 3 startup companies and commercial development and clinical trials of the GPER agonist G-1.

### HOW HAS YOUR EXPERIENCE WITH THE CMD INFLUENCED YOUR CAREER AND/OR YOUR CAREER PATH?

My associations with the CMD fostered the development of my entrepreneurial aspirations, which have in return led to a collection of patents and the development of multiple startup companies. The identification of GPER-selective ligands also led to the redirection of my research efforts into more physiological and therapeutic directions. For the last approximately 12+ years, my lab has investigated the role of GPER, and its selective ligands, in cancer, cardiovascular and immune systems and well as metabolism. Licensing and collaboration with Linnaeus Therapeutics led to Phase I clinical trials at UNM, the first ever for a compound discovered at UNM. The combination of G-1 with immune checkpoint inhibition as a Phase II trial began recently. This direction of drug discovery has continued with the exploration of novel compounds that selectively target the classical estrogen receptor alpha, with the goal of reducing hormone therapy resistance in breast cancer.

### WHAT ARE YOUR FAVORITE MOMENTS?

My favorite moments are celebrating successes, be they grants, papers or personal achievements, with the members of the CMD and its collaborators.

## TIONE BURANDA, PHD

ASSOCIATE PROFESSOR, DEPARTMENT OF PATHOLOGY



### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

High-throughput flow cytometry (HTFC) was developed within the Department of Pathology at The University of New Mexico and commercialized by Intellicyt Corp. The broad applicability of HTFC to high throughput screening was last documented in a special issue of SLAS Discovery: High-Throughput Flow Cytometry in Drug Discovery published in SLAS in 2018, which spanned a wide range of research papers, application notes, and technical notes that reflected recent advances in the field; including several contributions from the UNM community.

### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS WORKING WITH THE CMD?

CMD provided the rationale for establishing rigorous protocols for UV-inactivation of deadly viruses such as hantaviruses (e.g., Sin Nombre virus or SNV) and SARS-CoV-2 inside a BSL3 containment lab and enabled characterization in a BSL-2 setting. More than ten years ago, we developed a protocol to label inactivated SNV with a known number of fluorophores. This helped us to use the virus particles as probes for HTFC screen for molecular inhibitors of cell entry. Also, we were able to use the killed virus to elucidate the mechanism of entry. I received R21 funding for developing a screen of the Prestwick library for small molecule inhibitors of SNV infection and an R03 for mechanistic studies. We have recently recapitulated the same approach for SARS-CoV-2.

### HOW HAS YOUR EXPERIENCE WITH THE CMD INFLUENCED YOUR CAREER AND/OR YOUR CAREER PATH?

The need for a robust probe suitable for high throughput discovery presented a unique research tool for virology outside a BSL3 containment. More importantly, it established unique expertise and rationale for pivoting to SARS-CoV-2. Thus, my lab was well positioned to apply for CTSC pilot funding, and a scored R03 grant to develop a protocol for UV inactivation and calibrated fluorescent labeling of SAR-CoV-2. The philosophy behind the establishment of CMD fostered the translation of assay development solutions to entrepreneurial tendencies. Because the CMD enabled interdisciplinary activity confluence, I collaborated with Dr. Wandinger-Ness to develop a flow cytometry-based assay for GTPase activity as read-outs for disease therapeutics. This activity was highlighted by a US patent award, a divisional patent attached to the parent as well as pending international patent application. We recently submitted an STTR grant in partnership with Elroy SPAC, led by CEO John Chavez and Dr. Steven Young (TriCore Reference Laboratories).

### WHAT ARE YOUR FAVORITE MOMENTS?

My favorite moments gatherings with CMD colleagues after hours.





## ALEXANDRE CHIGAEV, PHD

RESEARCH ASSOCIATE PROFESSOR, DEPARTMENT OF PATHOLOGY



### HOW IS THE CMD DIFFERENT FROM THE OTHER CENTERS IN THE FIELD?

UNM CMD was an exceptional center created around the specific technology invented and developed at UNM by Drs Larry A. Sklar and Bruce Edwards: the high-throughput flow cytometry. I am not sure how many US patents were awarded for this technology, but my estimate would be about a dozen or more. To the best of my knowledge, no other screening center that specializes in high throughput flow cytometry in the world exists.

This technology is uniquely suited for the analysis of immune cells, leukocytes, as it takes advantage of the flow cytometry that every immunologist is using on an every day basis.

Because of its unique nature, high-throughput flow cytometry allows for drug discovery and development projects for a specific set of diseases that include immune disorders, autoimmune diseases, blood cancers, hematopoietic stem cell research and immunotherapy development. These types of projects would be very difficult to do using other existing technologies. This is the reason why flow cytometry was developed in Los Alamos in the first place, to specifically look at blood cells to study effects of ionizing radiation at the dawn of the nuclear age.

To perform highly technologically advanced studies using high-throughput flow cytometry technology, a team of scientists who are trained and experienced in assay development, validation and execution is necessary. Because of the relative novelty of the technology, this is not a skill that is currently taught at colleges and universities.

### CAN YOU HIGHLIGHT YOUR BIGGEST ACCOMPLISHMENTS WORKING WITH THE CMD?

Personally, as a part of UNM CMD, I participated in two high-throughput flow cytometry drug discovery campaigns that went from an idea, through assay developments and validation, high-throughput screen, hit identification, hit validation all the way to the UNM initiated clinical trial in one case and to the preclinical studies in the mouse xenograft model in the other. These studies resulted in three awarded US patents and multiple publications.

## MAKE A GIFT

Your gift today impacts healthcare and research for tomorrow. Please consider making a recurring, one time, or legacy donation to one of the following funds:

### THE FOUCAR ENDOWMENT

Invest in future Pathologists. Recruiting and training highly proficient Pathology residents and fellows is a top priority.

[VISIT The Foucar Endowment](#)

### THE GEORGE D. MONTOYA RESEARCH SCHOLARSHIP FUND

Encourage UNM students to pursue a career in biomedical research.

[VISIT The George D. Montoya Research Scholarship Fund](#)

### THE THOMAS M. WILLIAMS & MARGARET G. WILLIAMS ENDOWMENT FOR EDUCATION AND TRAINING

Support the greatest educational and training needs within the Department of Pathology.

[VISIT The Dr. Thomas M. Williams & Margaret G. Williams Endowment for Education and Training](#)

### UNM SCHOOL OF MEDICINE STUDENT EMERGENCY FUND

Donate to the UNM School of Medicine Student Emergency Fund to support medical students and residents:

<https://www.unmfund.org/fund/som-student-emergency-fund/>

## DONATE

Donate by credit card through the UNM Foundation website. Specific links to each Pathology fund are listed at <https://hsc.unm.edu/medicine/departments/pathology/make-a-gift/>

Donate by check, estate planning, bequest, charitable annuity, insurance gift, charitable trust and more.

Thank you for thinking of The University of New Mexico Department of Pathology funds as you generously give!

## FACULTY NEWS

### NEW FACULTY



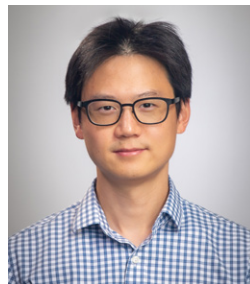
**Laura Toth, DO, MPH**, joined as Visiting Assistant Professor in the Hematopathology Division on July 1, 2020.

Dr. Toth



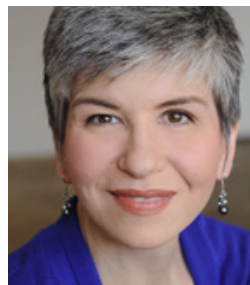
**Hakim Djaballah, PhD**, joined as Research Professor in the Research Division, as the Director of the Center for Molecular Discovery, on August 24, 2020.

Dr. Djaballah



**Tae-Hyung Kim, PhD**, joined as Assistant Professor in the Research Division on August 24, 2020.

Dr. Kim



**Evelyn Lockhart, MD, MScBMC**, returned as Associate Professor – Clinician Educator in the Transfusion Medicine/Clinical Pathology Division on October 15, 2020.

Dr. Lockhart



**Nykkole McCary, MLS (ASCP)**, joined the Medical Laboratory Sciences Program as Lecturer II on December 7, 2020.

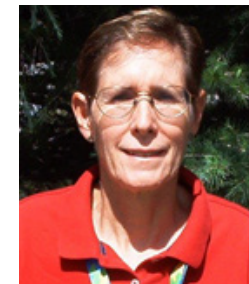
Nykkole McCary

### RETIRED FACULTY



**Larry Sklar, PhD**, retired as Professor Emeritus effective November 1, 2020.

Dr. Sklar



**Martha Sherlin** retired as Lecturer II effective January 1, 2021.

Martha Sherlin



**Kendall Crookston, MD, PhD**, retired as Professor Emeritus effective February 1, 2021.

Dr. Crookston

### FACULTY AWARDS

**Dr. Karissa Culbreath** was a 2020 recipient of the 13th annual New Mexico Humanitarian Awards, presented by the Jewish Community Center of Greater Albuquerque. She was honored for her support of underserved populations, and her leadership and inspiration in dealing with COVID-19.

**Dr. Larry Sklar** was named a Fellow of the National Academy of Inventors. Sklar is among 175 academic inventors being recognized this year for their work in creating or facilitating outstanding inventions. Election as an NAI Fellow is the highest professional distinction accorded solely to academic inventors.

**Dr. Stephen Young** was elected as an American Association for the Advancement of Science (AAAS) Fellow. AAAS honors members whose efforts on behalf of the advancement of science or its applications in service to society have distinguished them among their peers and colleagues.



## UPCOMING FACULTY TALKS

### DARIO MARCHETTI, PHD

Selected Speaker at 2021 AACR Annual Meeting

“Primordial CTC profiling reveal signatures for metastatic melanoma organ specificity”

April 10-15, 2021 & May 17-21, 2021

<https://www.aacr.org/meeting/aacr-annual-meeting-2021/registration/>

### ELAINE BEARER, MD, PHD

American Society for Investigative Pathology (ASIP) virtual annual meeting at EB2021

Session: Pathobiology of Neural Disease.

“Brain connectivity and activity during Alzheimer’s disease progression in a mouse model by manganese--enhanced MRI in living brain correlated with post-mortem histopathology”

April 27-30, 2021

<http://asip2021.asip.org/>

American Society for Investigative Pathology (ASIP) virtual annual meeting at EB2021

Session: Lunch and Learn: The ABC of the IDP, a mentoring workshop.

“Beyond the IDP—Self Evaluation of Progress over an entire career Workshop: Avoiding Difficult Conversations: Creating An IDP”

April 27-30, 2021

<http://asip2021.asip.org/>

Award ceremony:

Campaign alumni Award: The Audacious

“This award recognizes those who have achieved a singular, remarkable accomplishment by setting a vision so impactful that others might have doubted it could be done.”

University of California San Francisco, San Francisco, CA, June 2021, virtual

Gordon Research conference “InVivo MRI”

Session: Novel Biomedical targets for application of Magnetic Resonance. Proctor Academy, Andover, NH.

“Beyond structure: MR of physiology”

(Postponed to July 2022 due to COVID-19 pandemic)

<https://www.grc.org/in-vivo-magnetic-resonance-grs-conference/2022/>

### SARAH LATHROP, MD

Panel Discussion at the Association for Prevention Teaching and Research Annual Meeting – Teaching Prevention 2021 (virtual)

Stone N, Shrum-Davis S, Lathrop SL, Hicks J, Judson M, Gentry-Funk T, Blankman N, Quinn T, Armitage K.

“Development of a ‘Just-in-Time’ Interdisciplinary Public Health Pandemics Course.”

March 8, 2021

<https://www.aptrweb.org/>

<https://www.teachingprevention.org/>

### LARRY A. SKLAR, PHD

Oxford Global Biomarkers: Flow Cytometry & Multiplexing Tools Symposium (virtual)

“Multiplexed High Throughput Flow Cytometry for Drug Discovery and Repurposing”

April 8, 2021

<https://www.oxfordglobal.co.uk/virtual-symposium-flow-cytometry/>

2nd Annual GCC Innovative Drug Discovery and Development Conference

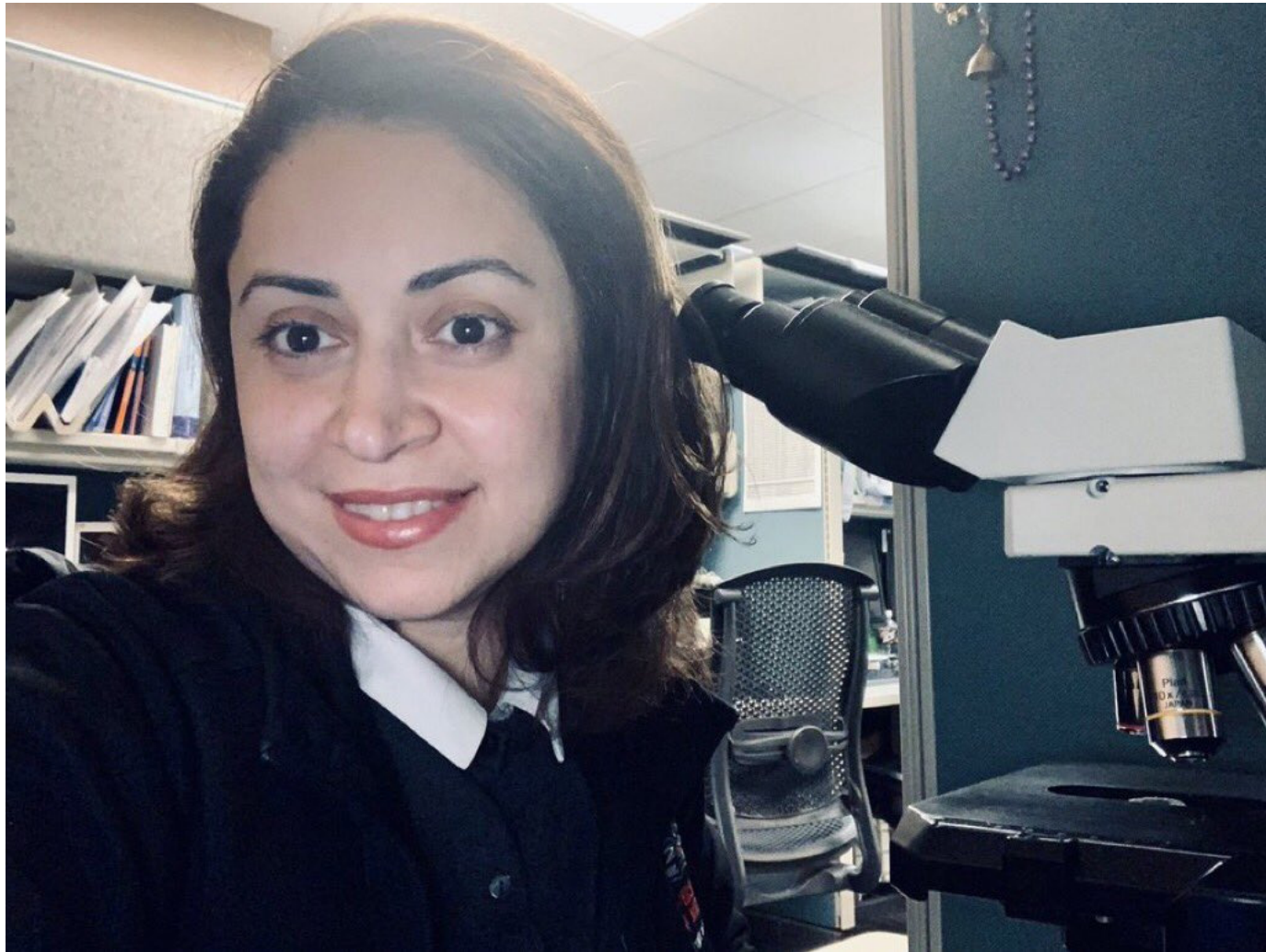
“High Throughput Flow Cytometry for Drug Discovery and Repurposing”

May 10-11, 2021

<http://iddd2020.blogs.rice.edu/>

## IN MEMORIAM: DR. MARYAM SAYAH

Maryam was an integral part of our residency family and will be missed.



## ACKNOWLEDGEMENTS

The University of New Mexico Department of Pathology gratefully acknowledges Mr. William F. Collins for the design and layout.

Please share your news with: William F. Collins: [wfcollins@salud.unm.edu](mailto:wfcollins@salud.unm.edu)

For more information on our department, please visit our website:  
<https://hsc.unm.edu/medicine/departments/pathology/>