“Publish or perish” has long been an aphorism in academia but one wonders about the health of traditional outlets of medical literature in the current age of the internet and digital media. The plight of declining subscriptions to newspapers and magazines is well known, with some survivors successfully navigating the transition to online content, but with many others indeed perishing in the digital age. One may wonder how medical journals are faring and what changes have been seen in this arena over the past few decades. It turns out that the Department of Pathology at The University of Virginia is a good place to make queries about the health and changes in medical and scientific literature. Over the past 10 years, eight faculty have served as editor or associate editor of the following journals, representing some of the top journals in our field:

**Clinical Chemistry** (Jim Boyd, David Bruns)
**Diagnostic Molecular Pathology** (Mark Stoler)
**Int. Journal of Gynecological Pathology** (Mark Stoler)
**Journal of Immunology** (Tim Bullock, Jim Gorham)
**Journal of Immunotherapy for Cancer** (Tim Bullock)
**Journal of Neuropathology and Experimental Pathology** (James Mandell)
**Laboratory Investigation** (Jim Gorham)
**Practical Reviews in Pathology** (Stacey Mills)
**The American Journal of Clinical Pathology** (Mark Wick)
**The American Journal of Surgical Pathology** (Stacey Mills)

In general, the basic tenets of traditional medical and scientific publications haven’t changed much – journals are still seen as the primary venue in which to vet and report advances and findings in the field, and the process of rigorous peer review remains intact. However, the business side of publication and how practitioners consume this information has changed, parallel to the changes that have been seen in the lay press.
In Focus: Editors Eye Pathology Progress

Laboratory Medicine, by David Bruns, M.D.

In this issue of UVA Path Report, Chris Moskaluk has reflected on 'the health of traditional outlets of medical literature in the current age of the internet and digital media'. He invited me to write about the changes that I saw as editor of Clinical Chemistry, from 1990 to 2007. On reflection, the thing I find most interesting is that, despite upheavals in publishing during those years, Clinical Chemistry flourished financially and by every measure of scientific impact, and did so without luring submission fees, page charges or open access fees. This outcome was the result of many factors; below are some that I suspect were important. Although I didn’t realize it at the time, the environment of the Department of Pathology made several of them possible.

In 1990, the Journal’s impact factor was falling as was the number of subscriptions. The Journal’s print advertising, a key source of revenue, was decreasing; a plot of the number of ad pages per year versus calendar year showed a straight line downward. Extrapolation of the line suggested that ad pages would reach zero a few years hence. A colleague suggested that we should take the high ground and announce one year before the inevitable that the Journal would no longer accept ads. The clinical chemistry association, AACC, which publishes the Journal, was not enthralled with that idea.

Fortunately, the AACC leadership judged the success of the Journal based not on financial performance, but on scientific impact, and they gave the editor a free hand. I was able to subject all submitted papers to stricter peer-review, and had papers reviewed by 2-3 experts on clinical aspects, analytical aspects and the biomarker or gene being measured. Experts in specialty areas such as lipids and toxicology agreed to serve as Associate Editors. Notably Jim Boyd of our department became Deputy Editor and reviewed the statistics in countless papers. I pursued getting the Journal online early. Stanford University Library’s “HighWire Press” agreed to host the Journal online, thus linking us with major pioneering journals including NEJM and Science. And we worked with Stanford and two other journals to develop an online manuscript submission and tracking system, “BenchPress”, now used by scores of Journals including Clinical Chemistry.

Continued on page 4.

In Focus: Editors Eye Pathology Progress

Surgical Pathology, by Stacey Mills, M.D.

The American Journal of Surgical Pathology (ASP) began its ‘career’ at the same time that I began mine, in 1977. These were the days of simple case series. You collected a group of cases representing an entity, documented the histologic and clinical features, and wrote them up for publication. The histologic features were predominantly based on H&E stains. Immunohistochemistry didn’t exist. Neither did HIPAA or IRB regulations. Patient’s names, of course, were not disclosed and identifiable images were not published without permission, but otherwise there was no consent form or IRB approval required.

The life of a manuscript in the 70s began as a handwritten document, written and rewritten until you had a cogent handwritten draft. This was taken by a departmental secretary (now administrative assistant), and converted to a more legible typewritten draft, double or quadruple spaced so that you could make additional changes on that draft. References? There was no End Note or Reference Manager software. References would be typed out by hand, manually organized, numbered and the numbers handwritten in the text at the appropriate points.

For illustrations, black and white print photography was the only form journals would accept. The premier camera lived in the department of biomedical communications and was supervised by an extremely good photographer. You set the field and magnification and the photographer did the rest, adjusting the condenser, light and focus, and capturing your image on a large format 4x5 film negative. You took the subsequent prints (3 copies) trimmed them carefully on a paper cutter, labeled them on the back in pencil and packaged them up into three ‘figure packets’. The figure packets and three copies of the manuscript were mailed (snail, not e-) to the journal office, along with a cover letter. Then you waited. There was no acknowledgement of receipt, so you hoped it got there.

When I first began editing Modern Pathology in 1995, we were still receiving manuscripts as hard copies by snail mail. These arrived daily, the copies got sorted. one came to me for reviewer assignment and, after that, they were mailed out to two selected reviewers with the third copy staying in the office. With about 750 manuscripts a year, each going out to two reviewers, then back to the authors for either revision or rejection, the files took up a lot of space and the yearly postage charges were in the thousands of dollars.

When I switched to editing ASP in 2000, we were still receiving hard copy manuscripts but within about a year we switched to online submissions using the Editorial Manager system. Digital versions of the text and illustrations replaced physical copies. I was initially not at all comfortable with this change and had visions of server crashes, delays, lost manuscripts, etc. None of this ever came to be and the change has been a vast improvement for both authors and editors, saving time, space, and postage and providing much better author feedback.

Just as the manner of submitting and handling manuscripts has changed dramatically in the last decades, their content has changed as well. Pure H&E morphologic studies, once the bread and butter of surgical pathology literature have been largely replaced by submissions dealing, at least in part, with newer molecular technologies. Although we have seen tremendously, there is still (and always will be) room for careful morphologic observations. It is always disappointing when a manuscript devotes only a few lines to what the lesion actually looked like on an H&E section and then devotes many pages to ancillary studies of variable diagnostic value. The ability to write a careful morphologic description, moving methodically from low to high magnification is a skill that should not be allowed to atrophy. As an example, hunt up the article on nasopharyngeal angiofibroma by Steve Stenborg, published in Cancer in the 1950s. This is an absolutely exquisite description of the microscopic appearance and variations of this lesion. There’s really nothing else to say on the topic, and almost no one else has tried.

Continued on page 5.
A desire to get papers in a new area is not a guarantee of good papers. Fate was on our side when we looked for Associate Editors for Molecular Diagnostics. I was lucky to meet and recruit two leading scientists as Associate Editors. One was Dennis Lo, who pioneered diagnostic applications of cell-free nucleic acids in plasma, including applications in the prenatal diagnosis of trisomies by characterizing fetal DNA in maternal plasma. The second was Carl Wittwer, a pathologist who developed rapid-cycle PCR (usually just called ‘PCR’ these days), real-time PCR, melting curve analysis, film array analysis and the analyzers called LightCycler and BioFire, among others. Lo and Wittwer raised the standards for publication of molecular diagnostics papers in Clinical Chemistry.

As with molecular diagnostics, to the proteome followed naturally from events in the Department of Pathology. In the mid-1980s, John Savory obtained an NIH grant to bring triple-quadrupole mass spectrometry to our department. Dave Herold, when he was a resident and later an Assistant Professor, used that instrument to study prostaglandins and organized a course for us on mass spectrometry. At about the same time, Liz and I had the good fortune to provide our favorite protein (calbindin-D9k, later called S-100G) to Don Hunt, in the Department of Chemistry and Pathology, for amino-acid sequencing; this adventure showed us up close the power of mass spectrometry for protein analysis. While many clinical chemists continued to think of mass spectrometry as a technique for small molecules, the pioneers like Don Hunt showed that proteins, too, were fair game.

A recent Letter to the Editor of Clinical Chemistry written by Dr. Bruns and colleagues Dr. Garrett Mullins and Dr. James Harrison describes a novel use of smartphones in monitoring blood sample transport through hospital pneumatic tube systems. A video demonstration of their findings can be found at: https://news.virginia.edu/content/watch-smartphones-wild-ride-through-hospitals-pneumatic-tube-system

There is no doubt that ancillary testing of tumors was related to Epstein-Barr virus (EBV) by PCR when in reality, the scattered EBV-containing normal lymphocytes which most of us harbor were being amplified, rather than the neoplasm. Similar mistakes have occurred with regard to human papillomavirus and PCR.
Research Spotlight

The Bullock Lab focuses on understanding the basis of why T cells lose their function in the tumor microenvironment and how to re-functionalize them. Recent studies from Lelisa Genta have indicated that part of the dysfunctional state may be attributable to the loss of glycolytic activity, a result of aberrant energy function. He is expanding his studies to look at human tumor-infiltrating lymphocytes. Aaron Stevens has been working on elucidating how transcriptional changes in tumor-infiltrating lymphocytes regulate their activity, with a particular focus on the transcriptional repressor BLIMP1. Alan has also demonstrated that vaccinating against tumor antigens sustains T cell function in the tumor and substantially enhances their ability to control tumor outgrowth. As our ability to identify new antigens in tumors that are due to their mutagenesis improves, these vaccination approaches could become very useful. Melissa González has been studying how mitochondrial function influences T cell activity and whether regular fusion and fission can increase T cell function in tumors. She has also been establishing the function of the TNF superfamily member, CD70, on T cells. The lab has an expanding collaboration with the Focused Ultrasound group in Biomedical Engineering in which we will be able to test how our new technology can be leveraged to augment T cell infiltration and function within the tumor microenvironment. Finally, we have been collaborating with members of the Cancer Center to understand whether standard of care chemotherapies can be integrated with immunotherapy, or whether we can define other chemotherapies that act more synergistically.

The Fielder Laboratory is dedicated to discovering the etiology of hypertension and salt sensitivity of blood pressure, the world’s most prevalent and costly diseases. Using a multidisciplinary and translational approach, we have deciphered some of the biochemical mechanisms behind these diseases. Furthermore, we have studied the impact on human health through novel mouse models, developed novel diagnostic devices and assays to identify their presence, and developed novel technologies to reduce their economic impact on individuals and society. The work in the Fielder Lab has led to over 100 publications, 22 patents, three edited textbooks, 5.5M in NIH grant funding, and 19 companies spun out of UVA.

The Goldfarb Lab has made some exciting advances in the realms of megakaryocyte and red cell development. We have found a key factor in normal human megakaryocytes that dictates whether they develop in the manner of fetal/neonatal or adult megakaryocytes. This developmental difference is important as it underlies the clinical problems of thrombocythemia in neonates and delayed platelet recovery in cord blood transplant patients. Identification of this fetal master switch has enabled design of small molecule inhibitors that can convert fetal-type megakaryocytes into adult-type cells. In the realm of red cell development, we have identified a novel nutrient deprivation pathway in which iron availability dictates erythropoiesis responsiveness of erythroid progenitors. Specifically, a protein complex has been identified which couples iron levels both inside and outside the cell with surface delivery of the erythropoietin receptor and with the signaling properties of this receptor. This pathway is relevant to the pathogenesis of anemia associated with chronic inflammation and underlies the development of occult anemia in anemic patients treated with erythropoiesis. These findings also shed new light on the therapeutic mechanism of action of our new anemia therapy, isocitrate.

The Li Lab—A gene is defined as the molecular unit of heredity. Genes and their products (RNA and protein) are believed not to intermingle except in cancer. This developmental difference is important as it underlies the clinical problems of thrombocythemia in neonates and delayed platelet recovery in cord blood transplant patients. Identification of this fetal master switch has enabled design of small molecule inhibitors that can convert fetal-type megakaryocytes into adult-type cells. In the realm of red cell development, we have identified a novel nutrient deprivation pathway in which iron availability dictates erythropoiesis responsiveness of erythroid progenitors. Specifically, a protein complex has been identified which couples iron levels both inside and outside the cell with surface delivery of the erythropoietin receptor and with the signaling properties of this receptor. This pathway is relevant to the pathogenesis of anemia associated with chronic inflammation and underlies the development of occult anemia in anemic patients treated with erythropoiesis. These findings also shed new light on the therapeutic mechanism of action of our new anemia therapy, isocitrate.

The Luckey Lab—Many patients are exposed to foreign red blood cells (RBC) via either transfusion of pregnancy. Though only a subset of patients respond by making anti-RBC alloantibodies, RBC alloimmunization represents a significant cause of morbidity and mortality worldwide. For chronically transfused patients who are unfortunate enough to generate multiple alloantibodies, provision of compatible antigen negative RBCs can be both time and resource intensive. In some cases, this can result in an inability to locate an otherwise life-saving therapy. Our research is focused on understanding the molecular drivers of anti-RBC alloantibody production. Specifically, we investigate how cytokines induced by transfusion therapy translate into the genetic programs required for anti-RBC antibody production and maintenance. Our initial work in mouse models has identified a key role for the cytokine IL-6 in controlling both anti-RBC T cell responses and subsequent alloantibody production. We are now investigating the role of IL-6-induced cytokines in the regulation of patient responses to RBC transfusion. The goal of our research is to better understand the molecular controllers of this pathogenic process in high-risk patients such as those with sickle cell disease, and in so doing provide diagnostic and therapeutic targets for the diagnosis and monitoring of BM.

The Mahadevan Lab is focused on understanding RNA toxicity and its role in the pathogenesis of myotonic dystrophy (DM1), the most common inherited muscular dystrophy in adults. The lab also has a strong translational focus on identification of pathways and targets that may be amenable to pre-clinical evaluation. To that end, we have developed the first inducible reversible mouse model of RNA toxicity and have used it to identify novel pathways such as the TWEAK/Fn14 signaling pathway and provided a proof of concept for the utility of a therapy that targets this pathway. We continue to have active collaborations with multiple pharmaceutical companies to evaluate novel therapeutic strategies to treat RNA toxicity in DM1. The collaborations are founded by our work and studies aimed at finding and understanding the molecular mechanisms of RNA toxicity especially in skeletal muscle and the heart.

The Mandell Lab extends body myoblasts (BMB) is one of the idiopathic inflammatory myopathies that together affect greater than 75,000 Americans. Recent work has suggested that some aspects of BM pathogenesis may be related to aberrant RNA metabolism. An explosion of basic research, including work done in the lab of our collaborator on this project, Dr. Anjumia Dutta, has identified key regulatory RNAs, including microRNAs that have essential roles in muscle differentiation and regeneration. These RNAs are released into the extracellular space, reaching the bloodstream and other body fluids in very stable forms, due to both membrane encapsulation and protein binding. Because muscle makes up nearly half of the total body mass, its RNAs and their metabolic products contribute a large component to body fluids, including blood and urine. Our work over the past year has revealed that a small cluster of microRNAs, many of which are derived from a cluster on chromosome 14q32, is highly and selectively upregulated in BM muscle. We have used RNAseq to identify key regulators and downstream effectors of these microRNAs, and we continue to work on the development of small molecule inhibitors that can convert fetal-type megakaryocytes into adult-type cells. In the realm of red cell development, we have identified a novel nutrient deprivation pathway in which iron availability dictates erythropoiesis responsiveness of erythroid progenitors. Specifically, a protein complex has been identified which couples iron levels both inside and outside the cell with surface delivery of the erythropoietin receptor and with the signaling properties of this receptor. This pathway is relevant to the pathogenesis of anemia associated with chronic inflammation and underlies the development of occult anemia in anemic patients treated with erythropoiesis. These findings also shed new light on the therapeutic mechanism of action of our new anemia therapy, isocitrate.

The Marchand Lab is focused on understanding the role of RNA toxicity in the pathogenesis of myotonic dystrophy (DM1), the most common inherited muscular dystrophy in adults. The lab also has a strong focus on the transcriptional repressor, BLIMP1. We compared the 12 most frequently used tools using simulated data as well as real experimental data. Their performance in terms of sensitivity, positive prediction value, computation time and memory were compared and tested (Scientific Reports, Kumar et al., 2016).

The Mani Lab is focused on understanding the role of RNA toxicity in the pathogenesis of myotonic dystrophy (DM1), the most common inherited muscular dystrophy in adults. The lab also has a strong focus on the transcriptional repressor, BLIMP1. We compared the 12 most frequently used tools using simulated data as well as real experimental data. Their performance in terms of sensitivity, positive prediction value, computation time and memory were compared and tested (Scientific Reports, Kumar et al., 2016).

The Sukumar Lab is focused on understanding the role of RNA toxicity in the pathogenesis of myotonic dystrophy (DM1), the most common inherited muscular dystrophy in adults. The lab also has a strong translational focus on identification of pathways and targets that may be amenable to pre-clinical evaluation. To that end, we have developed the first inducible reversible mouse model of RNA toxicity and have used it to identify novel pathways such as the TWEAK/Fn14 signaling pathway and provided a proof of concept for the utility of a therapy that targets this pathway. We continue to have active collaborations with multiple pharmaceutical companies to evaluate novel therapeutic strategies to treat RNA toxicity in DM1. The collaborations are founded by our work and studies aimed at finding and understanding the molecular mechanisms of RNA toxicity especially in skeletal muscle and the heart.
First Residents

Joseph (Joe) Copcock, M.D., Ph.D., was born and raised in Sioux Falls, South Dakota. He grew up working in a family owned shoe business and went on to attend Augustana University in Sioux Falls, earning his B.A. in both Chemistry (ACS Certified) and Biology with a minor in Mathematics. Early immersion in research as an undergraduate led him to pursue the combined M.D./Ph.D. program at the University of South Dakota, where his research focused on modulating the metabolism of HPV-related head and neck cancer cells, as a means of enhancing the anti-tumor immune response. As an M.D./Ph.D. student, Joe published five research articles, was elected into the Alpha Omega Alpha Honor Medical Society, and was a founding member of SCOPES (Student Club for Ongoing Pathology Education), the USD Sanford School of Medicine pathology interest group. His wife, Sara, works as a nurse in the thoracic-cardiovascular intensive care unit (TSV-ICU) at UVA. Outside of medicine, Joe enjoys reading, hiking, hiking and birding, dabbling in photography, exploring new places, and watching professional basketball and tennis.

Jacob Curley, D.O., received his medical training at Oklahoma State University’s College of Osteopathic Medicine in Tulsa, Oklahoma. His undergraduate background was in mathematics at Northeastern State University in Tahlequah, Oklahoma. Although Jacob spent the last 8 years in Oklahoma, he is originally from Missouri, Michigan, which he still considers his home-state. He is interested in dermatopathology, but also finds the field of bioinformatics highly intriguing. In his free time he loves trail running. He also enjoys participating (as a very mediocre amateur) in the sport of trail ultrarunning. While he’ll be very busy this year, he hopes to run an another 100-mile race sometime this winter/spring.

Mark Gorton, M.D., is from Belfeltonite, Ohio. Where he and his wife, Mary Beth, met in 1992 as fourth graders. Mark graduated from Ohio Northern University in 2005 and spent three years in research in the Center for Gene Therapy at Nationwide Children’s Hospital in Columbus, Ohio. He has a PhD in Genetics from the University of Pittsburgh. Mark and Mary Beth have two boys, Alexander (3) and Caleb (1), who enjoy ducks, bath time, reading and looking on books and sitting slightly out of tune. Mark has an interest in hematooncology and molecular genetic pathology fellowships and ultimately hopes to be in academic practice where he can continue enjoying his foremost passion, teaching.

Jennifer Ju, M.D., grew up in northern Virginia and briefly left the state to do her undergrad at Brown University where she double majored in Neuroscience and Art History. She returned to Virginia for medical school at UVA where she is excited to continue her training as a Pathology resident. Outside of the hospital, she enjoys exploring what Charlottesville has to offer, from concerts to local festivals to dining out. She looks forward to getting to know everyone better.

Ashley Volanic, M.D., is officially a ‘Triple H’ and very happy to be! She went to UVA for her undergraduate education and majored in chemistry with a specialization in biochemistry. During her undergraduate years, she spent every summer conducting research in a membrane protein lab looking at the structures of pathogenic proteins, while spending her free time hiking, running, and exploring Charlottesville with her then-boyfriend (now husband). After graduating, she spent a year in Alexandria, VA, and worked at a small science consulting company. She enjoyed discovering Washington, DC, and playing soccer with her friends, but she came running back quite happily to Charlottesville the moment she was accepted to UVA School of Medicine. During her time in medical school, she helped lead a pilot project in South Africa training Community Health Workers in diabetes and hypertension management. She returned to South Africa her fourth year to continue the project with additional training in Musculoskeletal Key areas. Her time abroad in the community health settings allowed her to gain a true appreciation for public health efforts, which she hopes to carry over to the pathology realm. She is so thankful and excited to spend another four years at UVA for residency and looks forward to continuing to do what she loves as well – running, hot yoga, walking her dog (or just watching her run with other dogs at the dog park!), hiking and camping, and just spending lazy afternoons on her back porch reading or watching her tomato plants grow. She truly considers Charlottesville her home – a place where she has found her family, both personally and professionally.

Research Spotlight

The Moskaluk Lab has been focused on understanding the role of cofactors that interact with the E6/E7 transcriptional control proteins in adenoid cystic carcinoma (ACC). The majority of ACC tumors have translocation mutations of the MYB gene, up-regulating the transcription of this gene and in some instances deleting negative regulatory domains. We have done a survey of known MYB interacting genes in ACC samples and found that most of them are present in the tumors. We have focused on the CBP/p300 co-regulatory proteins, and have shown by co-immunoprecipitation and proximity ligation assay that CBP/p300 interactions can be demonstrated in tissue samples of ACC xenograft tumors. In cellular efforts we have successfully grown several short-term cell lines of ACC tumor cells derived from our ACC xenograft models. We are using these cell lines as model systems to demonstrate the effect of MYB loss and disruption of MYB-CBP/p300 interactions. Our early attempts at RNAi-mediated knockdown of MYB in these cell lines indicate that when MYB gene products are nearly eliminated, the effects on ACC tumor cells is a decreased transition through the G2/M phase of the cell cycle, and an increased rate of apoptotic cell death.

The Tung Lab has published one paper in the Journal of Immunology, a second paper is under review, and a third project is under active pursuit. We first documented that autocrine growth factors (AG) associated with HH4/HH5/Palce and invasive tumor autostimulating occurs in normal mice after Treg depletion. Their strongly Th2-biased effector T cells develop resistance to Treg cell-mediated suppression. We then documented that male reesix genome angierten (MIGA) are neither completely sequenced nor consistently immunogenic; some are gaining, and male Treg cell-mediated tolerance others are sequenced and are not immunogenic. Significantly, sequenced MIGA are targeted in vivo, whereas non-sequenced MIGA are targeted in spontaneous infertility. Both MIGA are also expressed as cancer testis antigens and may influence tumor immunity. We presently study the effects of age on autoimmune diabetes (AOD) and AG that develop in the same mice. Adult diabetes mice develop Th2-dominant eosinophilic AG with Th2 response that targets ZP3, whereas juvenile mice develop severe Th1-dominant and NK/PIT cell dependent granulomas AOD, targeting different ovarian antigens. These striking ontogenetic differences are not replicated in the concurrent Th2-dominant AG. Thus two distinct immune mechanisms are operating in the same juvenile mice against different ovarian organs.

The Vande Putte Lab – Papillomavirus are the most prevalent sexually transmitted disease and leading infectious cause of cancer in the US, with a yearly economic impact of about $2.2 Billion (1). Despite a vaccine, lethal clinical disease will be a significant problem for many decades to come, especially in developing nations. The virus expresses two oncoproteins, E6 and E7, whose continuous expression is required to maintain the cancer. Our most recent studies are confirming that the contacts between E6 and p53 are in fact is important in living cells, and determining if there are additional E6 functions beyond the degradation of p53 is that are required for the full life cycle. A graduate student in the lab, Camille Lewis, is mapping additional features in the cellular machinery UBE3A that associates with E6, to determine how E6 interactions with UBE3A trigger ubiquitin ligase activity. This may open new therapeutic opportunities. While the cancer associated HPV E6/E7 proteins target the degradation of p53, is that not how most human and animal E6/E7 proteins work. Their E6 oncoproteins inhibit a tumor suppressor pathway called NOTCH. We were the first to report this mechanism of E6 action, and we are extending this observation to explore how E6 proteins in diverse vertebrate species work. Finally, another recently graduated student, Sydney Smith, discovered a new mechanism of E7 oncoprotein action. She found that E7 manipulates cellular signaling to alter the global translation of cellular proteins in a way that induces the expression of the cellular protein c-myc. We hypothesize that the induction of c-myc by E7 is important in papillomavirus E7 cancer phenotypes and we will be testing this hypothesis in the coming year.

A figure of p53 (purple) bound to the LXXLL peptide motif in the target cellular protein (orange) and E6 (green, yellow, and blue)
First Year Fellows

Ashton Brock, Ph.D., is from Columbia, South Carolina. She received her B.S. in Chemistry from Winthrop University and her Ph.D. in Chemistry from the University of Virginia. Her Ph.D. thesis was completed in the biophysics and biochemistry lab of Dr. Linda Columbus, investigating detergent micelles and lipid-detergent bicelles as membrane mimics for membrane protein characterization. Ashton enjoys painting, trying new foods, listening to music, and travelling with family and friends. She is currently a Clinical Chemistry fellow at UVA.

Hongyan Dai, M.D., Ph.D., was born and raised in China. After receiving her medical degree and M.S. in Pathophysiology from Hebei Medical University, she came to the U.S. to pursue her interest in basic medical research. She studied the role of preconditioning in alleviating ischemia and reperfusion injury at the University of Missouri and graduated with a Ph.D. degree in Physiology. She then completed a residency in Anatomic and Clinical Pathology and a fellowship in Surgical Pathology at the University of Kansas. She is now working on a fellowship in Dermatopathology at UVA. She and her husband have three young sons. In her spare time, she enjoys cooking, travelling and spending time with her children.

Chris Heitz, M.D., was born in Harrisonburg, VA. He received his B.S. in chemical engineering from Virginia Tech and completed his medical degree at Virginia Commonwealth University. He completed a residency in Anatomic and Clinical Pathology at UVA in 2016, where he was Chief Resident in his final year. He is now completing a fellowship in Dermatopathology at UVA. He and his wife have a wonderful 3-year-old daughter. Claire. His outside interests include sports, Hokie sports, fitness, guitar, music, and spending time with family.

Jessica Kwock, M.D., is originally from Boston, Massachusetts. She received her undergraduate degree from McGill University in Montreal and her medical degree from Georgetown University School of Medicine. She recently completed residency in Dermatology at UVA and is delighted to have the opportunity to stay at UVA as a Dermatopathology fellow. She enjoys hiking, cooking, painting, and spending time with friends and family.

Edward (Kelly) Mrachek, M.D., grew up on a family farm in western North Dakota. He went to undergrad at Concordia College, Moorhead, MN, where he graduated cum laude with honors in biology in 2008. He went to medical school at Creighton University School of Medicine, Omaha, NE, graduating in 2012. He then pursued pathology residency at Pennrose Hospital, Colorado Springs, CO, and is board certified in Anatomic and Clinical Pathology. He is currently a Neuropathology fellow at UVA. Kelly and his wife, Becky, have one young daughter, Sophia. When not spending time with family and friends, Kelly enjoys the outdoors with hiking, fishing, reading and watching science fiction, and keeping up with the family farm.

First Year Trainees

Sydney Webb Strickland, Ph.D., received a B.S. degree in Biochemistry from Roanoke College and a Ph.D. degree in Experimental Pathology from UVA. Her Ph.D. research was focused on the altered cell signaling induced by HPV E7. She is now looking to broaden her interests as she begins a Clinical Chemistry fellowship at UVA. Her outside interests include playing on several city league volleyball teams and beach volleyball whenever she gets a chance. She also loves watching UVA men’s basketball (WarHooah!) and reading murder mystery novels.

Lindsey (Verduin) Serkes, M.D., was born in South Florida but much prefers the mountains of Virginia. She received a B.S. degree, M.S. degree in Forensic Science, and M.D. degree from the University of South Florida. She then completed a residency in Anatomic and Clinical Pathology at UVA in 2016, where she was Chief Resident in her final year. She is now completing a Cytopathology fellowship at UVA. She and her husband enjoy hiking and mountain climbing, especially in Germany, and share their home with a beloved Weimaraner named Rolalt.

Patrick Voorhees, M.D., was born in Indiana. He attended university at Loyola University in Chicago. He received a M.S. degree in Oceanography at the University of Maine. He then completed a M.D. degree in Forensic Science, and M.D. degree from the University of South Florida. He is now completing a residency in Anatomic and Clinical Pathology at Walter Reed Army Medical Center and has since served as a staff pathologist at Tripler Army Medical Center in Honolulu, HI, and at Fort Belvoir Community Hospital in northern Virginia. He is thrilled to have the opportunity to train at UVA as a Dermatopathology fellow. He enjoys playing baseball and spending time with his family.

Brian Willis, M.D., grew up in the small town of Mt. Shasta in Northern California. He attended UC Davis and Pacific Union College in California for undergraduate studies and graduated with a Bachelors of Science in Biology. After taking a year to work as a lab tech for Hess Collection Winery in Napa he headed back to school to complete his M.D. at Loma Linda University. Along the way, he completed a one year AP only Post Sophomore Fellowship at the Loma Linda Department of Pathology. He then headed to Atlanta where he completed his AP/CP residency at Emory University with a particular focus on soft tissue pathology under Dr. Sharon Weiss. He is currently the Gynecologic Pathology Fellow at UVA.
First Year Trainees

Entering Graduate Students

John “Robbie” Cornelison hails from Lynchburg, Virginia and did his undergraduate degree in Biology at George Mason University followed by a Master’s in Biotechnology at Johns Hopkins. After a stint in industry doing some esoteric RNA techniques, he was hired to help complete the development of the tissue microarray technology at NIGRI/NIH back in the late 90’s, and was also involved in developing the RNA live cell microarray. He continued at NCI for 12 years in breast cancer lead target discovery and investigating viral etiologies in pediatric gliosarcoma and other neural malignancies. He joined Dr. Chip Landen’s group in early 2015, and is investigating chemoresistance in epithelial ovarian cancer and novel compounds to circumvent it. Robbie also loves hiking, classical guitar, cooking and cats.

Pedro Costa-Pinheiro was born in Porto, Portugal and received a B.S. in Biology and M.Sc. in Molecular Oncology from the University of Porto. During his undergraduate and master programs he worked in the Cancer Biology & Epigenetics Group at Research Center of Portuguese Oncology Institute-Porto. For 5 years he worked with epigenetic projects aimed at finding new biomarkers for ulterior neoplasia and novel molecular pathways involved in these tumors. His Master’s thesis explored how microRNA-375 deregulation contributes to prostate carcinogenesis. In 2014, he was awarded a Fulbright scholarship to pursue his Ph.D. in the United States, and in 2015 he joined the UVA Biomedical Sciences Graduate Program. He is currently performing research in Dr. Mark Keser’s lab. and evaluating the potential role of sphingolipids might have in prostate cancer progression to more aggressive states. In his free time, he loves to watch sports of any kind, and also tries to play them (even when really bad at it). He also enjoys reading and travel. As a true Portuguese, soccer is his jam!

Marlissa Gonzales received her undergraduate degrees from Virginia Tech in 2015 in Chemical Engineering (B.S.), Biochemistry (B.S.), and Chemistry (B.A.). During her undergraduate time, she performed tissue engineering research with Ester Lauwers in WV which sparked her interest in biology/biochemistry. Marlissa then worked with Marathon Petroleum in KY on her senior project in process and plant design. Her graduate studies will be focused on mitochondrial and metabolic defects in tumor infiltrating lymphocytes (TIL) in Tim Bolduc’s lab; she is supported by the Immunology Training Grant. Outside of the lab, Marlissa enjoys watching sports - particularly football, reading, playing with her dog, Maci, and baking.

Riley Hannan is from Atlanta, Georgia, and received his B.S. in Biology from Georgia Tech in 2014. As an undergraduate, he spent three years studying synthetic peptide-like particles and the dysfunctional clotting cascade of newborns. He is pursuing his thesis research with Dr. Thomas Barkler and Dr. Shayn Perec-Cotlier. Riley hopes to better our understanding of how chemo-mechanical cues drive the cellular and tissue level balance between regeneration and fibrosis. His future after defending is uncertain, but the drive of scientific discovery means he won’t end up far from a lab bench. When able, Riley enjoys cooking, reading, hiking, haircare, and scrapbooking electronics for spare parts.

Md. Jashim Uddin was born in Bangladesh and received B.S. and M.S. degrees in Biochemistry and Molecular Biology from University of Dhaka, Bangladesh. Before coming to UVA, he worked at International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR,B) for a few years. While there he worked to define the biological basis for the under performance of oral polo and rotavirus vaccines in Bangladesh. He also worked to determine the major pathogens responsible for childhood diarrhoea in Bangladesh. At UVA, he will be working with Dr. William A. Petri’s group in the fields of infectious disease and immunology. He is a great fan of cricket and played cricket almost every day during his high school years. He still loves to watch cricket on TV and would like to be able to make a cricket team here. He enjoys cooking as well!

Alumni News

Felicia Allard, M.D., completed a cytopathology fellowship at UVA in 2016 and is currently an Assistant Professor in the Dept. of Pathology at the University of Oklahoma Health Sciences Center in Oklahoma City.

Audrey Bennett, M.D., completed her AP/CP residency and hematopathology fellowship at UVA and has been a pathologist at Licking Memorial Hospital in Newark, Ohio for the last 8 years. “Seeing a fair amount of hematopath and cytology,” she lives in Columbus, OH with her fiancé, to whom she is “permanently engaged,” along with their dog and cat.

Rahat Bhatti, M.D., completed his AP/CP residency in 2015 and hematopathology fellowship in 2016 at UVA. He is currently in community practice at Henrico Doctors’ Hospital in Richmond, VA.

Ben Cho, M.D., completed his AP/CP residency at UVA in 2014 and a hematopathology fellowship at Stanford in 2015 before accepting his current position in CORPath in Columbus, OH.

Miriam Conces, M.D., completed her AP/CP residency at UVA in 2015, and a Pediatric Pathology Fellowship at Nationwide Children’s Hospital in Columbus, OH in 2016. She is currently a Pediatric and Perinatal Pathologist at the Dept. of Pathology and Laboratory Medicine at Nationwide Children’s Hospital in OH.

Peter Cummings, M.Sc., M.D., completed his AP residency and Neuropathology fellowship at UVA in 2008. He is currently board certified by the American Board of Pathology in anatomic pathology, neuropathology, and forensic pathology. After leaving UVA he completed his forensic pathology fellowship in Boston, MA in 2009. He has been featured in People Magazine (A Cold Case Comes to Life, April 13, 2009) and appeared on two episodes of NOVA Can Science Solve Crime? (Oct 17, 2012) and Cold Case: JFK (Nov 19, 2011). As part of his work on the UVA JKF episode, he was granted permission by the Kennedy family to review the original autopsy material in the National Archives. He is the only private, non-government appointed forensic pathologist in Maine. He has also authored two textbooks, in conjunction with UVA Path alumni Dr. Darin Trella, Dr. Robert Malm, Dr. John Wakefield, and Dr. Tim Murphy. His future after defending is uncertain, but the drive of scientific discovery means he won’t end up far from a lab bench.

Garth Fraga, M.D., completed his Dermatopathology fellowship at UVA in 2000 and is currently an Associate Professor of Pathology and Dermatology at the University of Kansas in Kansas City. His three kids (Hannah 15), Charlie (13) and Sydney (10) “keep us busy with their swim meets, fencing, and love of performing arts (nary a day goes by without someone busting out a song from the musical Hamilton).”

Sheryl Johnson, M.D., completed her AP/CP residency at UVA in 2016 and is currently a Pediatric Pathologist at Cincinnati Children’s Hospital in Ohio.

Kristin La Fortune, M.D., completed her AP/CP residency at UVA in 2015 and a cytopathology fellowship at Indiana University in 2016. She is currently a pathologist with Ohio Valley Pathologists, as well as an Assistant Professor at Indiana University School of Medicine in Evansville, IN.

Stephen Long, M.D., completed his AP/CP residency in 2013 and has a hematopathology fellowship in 2014 at UVA. He is currently a pathologist at UC-San Francisco.

Vunchuan Delores Mo, M.D., completed her AP/CP residency in 2015 and fellowship in Blood Banking and Transfusion Medicine in 2016 at UVA, before accepting her current position at Children’s National Health System in Washington, DC.

Karyn Prenshaw, M.D., completed her dermatopathology fellowship at UVA in 2016 and is currently a cytopathologist fellow at UVA.

Aleksa Shaw, M.D., completed her AP/CP residency in 2014 and cytopathology fellowship in 2015 at UVA, followed by a fellowship in ENT Pathology at University of Pittsburgh. She is currently Associate Staff at the Cleveland Clinic in Ohio.

Scott Wendroth, M.D., completed his AP/CP residency at UVA in 2016 and is currently a hematopathologist fellow at Stanford University.

Zimin Zhao, M.D., completed an AP/CP residency at UVA in 2016 and is now completing a cytopathology fellowship at UCLA.

Faculty members Kristen Aliens, Aven Mills, and Mark Socolar continue with graduating cytopathology fellows Tapajna Taric (center) and Felicia Allard (far right).
Philanthropy

Margaret Moore and Lisa Friedman. Pathology Summer Enrichment Program participants

Sponsor a Pathology Summer Fellowship

With the retirement of long-time physician educator Don Innes, M.D. from our department in 2015, we received significant donations in his honor for use in supporting 2nd year medical students interested in exploring Pathology as a career option. Margaret Moore and Lisa Friedman recently concluded their participation in the 8-week Summer Enrichment Program in Pathology, and describe the experience in their own words below.

“I received a wonderful opportunity to participate in this internship. The Pathology Summer Enrichment Program provided rising second-year students with a unique blend of clinical skills, education, and research opportunities. We feel honored to have been the first students to participate in this internship. The program exposed us to many of the varied domains of both clinical and anatomic pathology. We were able to work directly with residents and faculty, attend tumor boards and lectures, and start research projects. We participated in activities as diverse as blood bank rounds, autopsy reviews, brain cuttings, and cytogenetics analysis. In reviewing our summer activities, we participated in over 30 unique educational experiences in different areas of pathology. Over the summer, our knowledge of pathophysiology deepened, and we became increasingly competent and confident in reviewing cases. Though we may not be able to diagnose all the cases that come through surgical pathology, we nonetheless feel like we have improved our clinical thinking and gained a great appreciation for the specialty. This was a wonderful experience, and we look forward to helping shape the program for future students.”

Donations can be made online by clicking on the “Make a Gift” button on the UVA Pathology website: https://med.virginia.edu/pathology/ OR, donations can be made by check or credit card using the enclosed self-addressed return envelope.

Grants and Contracts

New Grants and Contracts

PI: David Brunn, MD Thermo Fisher Scientific, Inc. Contract
Validation of New Biomarker Assay 06/22/16-01/17 Total Budget: $572,550
Abbott Labs Contract
Validation of New Prophylactic Test 08/18/15-09/17/16 Total Budget: $284,700
PI: Timothy Bullock, PhD
Focused Ultrasound Foundation Contract
Microbubble Cavitation for Immunotherapy to GGRM 10/01/16-4/30/17 Total Budget: $562,463
Calithera, Inc. Contract
Arginase-1 Inhibition in NSCLC 09/01/16-08/31/17 Total Budget: $1,105,760
Therascience, S.A. Contract
Drug/MoA Model Project: Focused Ultrasound 05/09/16-05/09/17 Total Budget: $20,540
Cancer Research Institute Grant
Development of S651 B-RAF Inhibitors 08/01/15-09/01/17 Total Budget: $2,125,450
PI: Helen Cathero, MD
Luna Innovations, Inc. Contract
Low-Cost Sprayable Barrier for the Prevention of Surgical Adherions 12/01/15-08/18/17 Total Budget: $1,984,320
PI: Robin Felder, PhD
National Heart, Lung and Blood Institute Grant
Molecular Mechanism of Salt Sensitivity of Blood Pressure 06/01/16-05/31/21 Total Budget: $8,511,503
George Washington Univ. Contract
Renal Osmocare 08/15/15-04/30/16 Total Budget: $1,578,098
PI: Adam Goldfarb, MD
National Heart, Lung and Blood Institute Grant
Validation of Acupuncture-based Stimulation Pathway as a Target for Anemia Treatment 04/01/16-03/31/19 Total Budget: $2,771,000
PI: James Gorham, MD, PhD
Bloodworks Northwest Contract
Genetics of Red Cell Storage 05/01/16-04/30/21 Total Budget: $1,514,825
PI: Alejandro Gru, MD
Seattle Genetics, Inc. Contract
Title: Analysis of CD30 06/05/16-09/05/17 Total Budget: $283,550
Other Active Grants and Contracts

PI: Thomas Brasiale, MD, PhD
National Institute of Allergy and Infectious Diseases Grant
CITL Response to Influenza Virus 09/01/15-11/30/17 Annual Budget: $950,000
PI: Timothy Bullock, PhD
Molokina Research Alliance Grant
Title: Enhancing Immune Therapy for Brain Metastases with Focused Ultrasound 12/01/15-11/30/18 Annual Budget: $1,250,000
National Cancer Institute Grant
Immunotherapeutic Nanoparticle Delivery to Melanoma with MR-guided FUS 06/01/15-11/30/20 Annual Budget: $559,778
Celltech Therapeutics, Inc. Contract
Immune Complement Study of Varicella-zoster and pileskin 05/26/15-05/31/22 Annual Budget: $14,529
National Cancer Institute Grant
BLIMP-1 Mediated Regulation of CD8+ TIL 01/01/15-11/31/17 Total Budget: $864,925
PI: Adam Goldfarb, MD
National Heart, Lung and Blood Institute Grant
Controlling an Ontogenic Masterswitch to Maximize Thrombopoein 09/10/15-05/31/19 2016 Budget: $465,925
National Institute of Diabetes & Digestive & Kidney Diseases Grant
Dissection and Manipulation of the Cellular Response to Iron Restriction 02/01/06-06/30/18 2016 Budget: $396,000
PI: James Gorham, MD, PhD
Emory University Contract
Adverse Effects of RBC Transfusions: A Unifying Hypothesis 09/01/15-03/31/18 Annual Budget: $49,387
PI: Dede Havensstick, PhD
Blue Ridge Medical Center Contract
In-office Consultations 02/26/15-12/31/16 2016 Budget: $5,000
PI: Hui Li, PhD
American Cancer Society-Grant
Functional Study of Chromic RMA SLC5A5-ELK4 in Prostate Cancer 07/01/14-06/30/18 Annual Budget: $198,000
St. Baldrick’s Foundation Grant
Gene Fusions in p16amplified cancers 07/01/14-06/30/17 Annual Budget: $110,000
National Cancer Institute Grant
CIS-Targeting: Cisplatin and DNA Repair 09/22/14-08/30/19 2016 Budget: $327,850
PI: Mani Mahadevan, MD
National Institute of Arthritis Musculoskeletal and Skin Disease Grant
Role of PTN in Urticaria Toxity 09/11/15-07/31/17 2016 Budget: $346,300
PI: James Mandell, MD, PhD
National Institute of Arthritis Musculoskeletal and Skin Disease Grant
Catalysis of Non-coding RNAs as Biomarkers of Inclusion Body Myositis 05/12/15-05/31/17 2016 Budget: $173,800
PI: Chris Moskaluk, MD, PhD
DOD Army Medical Command Grant
Lung 3D Bioprinting in a Resuscitation Network 07/01/15-09/30/17 2016 Budget: $395,000
National Cancer Institute Grant
Biospecimen Procurement & Tissue Microarray Manufacturing for the CHTN 04/24/15-03/31/19 2016 Budget: $597,282
PI: Kenneth Tung, MD
National Institute of Allergy & Infectious Diseases Grant
2-3x13 Cytokine and Pathophysiologic Study 09/01/13-10/31/17 2016 Budget: $395,000
PI: Scott Vande Pol, MD, PhD
National Cancer Institute Grant
Papillomavirus EB Structural Consortium 01/01/16-06/30/20 2016 Budget: $443,594
Publications and Awards

Selected Faculty Publications


Selected Faculty Publications

Journal Editors

Bullock TN: Associate Editor, Journal of Immunotherapy for Cancer.

Bullock, TN. Associate Editor, Journal of Immunology.

Gorham, JD: Associate Editor, Journal of Immunology.

Gorham, JD: Associate Editor, Laboratory Investigation.

Mandell JW: Associate Editor, Journal of Neuroimmunology and Experimental Neurology.


Mills SE: Editor, Practical Reviews in Pathology (a monthly audio review series).


Journal Articles


Selected Faculty Publications

Journal Articles Continued.

Publications and Awards

November 2016 | Page 16

Publications and Awards

November 2016 | Page 17
Publications and Awards

Selected Faculty Publications

Journal Articles Continued.


Book Editors


Williams ES, Silverman LA. Molecular Diagnosis of Human Disease. In: Molecular Pathology, 2nd edition (Coleman and Tsongalis, Eds.) In Press.

A more complete picture of faculty/research publications can be found on UVA Pathology Department’s faculty websites at: https://med.virginia.edu/pathology/contact/pathology/faculty/

Awards

Kristen Atkins received the Alumni Academic Achievement Award from the University of Vermont in June 2016, as well as the American Society of Cytopathology Excellence in Education Award in 2016.


The London publication “The Pathologist” listed David Bruns among the 100 Most Influential Pathologists (in position 16) and published a short biography which is available in print and online: https://therepathologist.com/the-power-list-2015/

Graduate student Lelisa Gemta (Bullock Lab) received Travel Scholarships for “Metabolism as a Functional Constraint of Tumor Infiltrating CD8+ T cells: Oral and poster presentation. Keystone symposium on Immunometabolism in Immune Function and Inflammatory Disease. Fairmont Banff Springs, Banff, Alberta, Canada. Feb 21-25, 2016.

Clinical Chemistry Fellow Garrett Mullins received the People’s choice Award at the Student Oral Presentation Contest during the 2016 Annual Meeting of the American Association for Clinical Chemistry. His talk won the Second Place prize overall, with a $500 cash award.

Garrett Mullins received the 2016 AACC Capital Section Travel Award and an AACC Student Research Travel Award, and, separately, he was selected to attend the Siemens Medical and Scientific Learning Exchange Program sponsored by Siemens Two fellows, Min Yu, MD, PhD, and Garrett Mullins, PhD, presented talks for which they received Young Investigator Awards at the 51st Annual Meeting of the Academy of Clinical Laboratory Physicians and Scientists. The titles of the talks are listed below.


Mullins GR, Harrison JH, Bruns DE. Smartphones can quickly and economically monitor medical center pneumatic tube systems. 2016 Annual Meeting of Academy of Clinical Laboratory Physicians and Scientists. Birmingham, June 2016. (Paul E. Strandberg Young Investigator Award).

Clinical Chemistry Fellow Garrett Mullins (PhD, UVA Pharmacology) won the Department of Pharmacology’s prestigious Rail Award at their department retreat in October 2015.

National Presentations

Oral Presentations


Oral Presentations


Sarah Kelting, M.D., U.S. and Canadian Academy of Pathology meeting, March 2016.

Chelsea Gottlieb, M.D., and Anne Mills, M.D. U.S. and Canadian Academy of Pathology meeting, March 2016.

Final Notes

2017 Calendar of Events

March 4-10, 2017
United States and Canadian Academy of Pathology (USCAP)
106th Annual Meeting
Henry B. Gonzalez Convention Center
San Antonio, TX

Alumni Dinner at USCAP
(Check UVA Pathology website for date/time)

April 28, 2017
University of Virginia Dept. of Pathology
13th Annual Research Day
Jordan Hall Conference Center
Charlottesville, VA

Faculty Promotions

Nadine Aguilera, M.D., has been awarded tenure.
Robin LeGallo, M.D., has been awarded tenure.

Congratulations to each of you on achieving this major milestone!

Digital Pathology Study

UVA pathologists Helen Cathro, James Mandell, Anne Mills, Stacey Mills, Mark Wick and Chris Moskaluk (P.I.) partnered with Philips Healthcare on a clinical trial to test the performance of a digital pathology system. The UVA pathologists independently assessed glass slides and their digitized analogs for 500 cases to determine if diagnoses rendered on the digital system matched traditional microscopic methods. The results are currently being used to support an application to the FDA for clinical use of the digital system.

ORIEN Program Update

The UVA Cancer Center became a member of the Oncology Research Information Exchange Network in 2015 (PI: Chris Moskaluk). In the last 8 months, UVA has enrolled over 700 cancer patients who have consented to donate their tissue and clinical data with the goal of developing more targeted cancer treatments and more quickly matching eligible patients to clinical trials. Please contact Joyce Miller, Ph.D., at jma8m@virginia.edu for more information.

ORIEN members (including Dr. Moskaluk, center) meet with White House officials in January to discuss their role in the Cancer Moonshot initiative to accelerate cancer research.

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For more information, please visit www.medicine.virginia.edu/clinical/departments/pathology

November 2016 | Page 20