ASBMB today

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**Annual Awards**

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In this month’s Q&A, Tiffany Oliver, an assistant professor in the biology department at Spelman College in Atlanta, talks about how the Minority Access to Research Careers program and practicing grantmanship at the predoctoral and postdoctoral levels influenced the trajectory of her career. She offers this bit of wisdom to young people considering careers in science: “My persistence has gotten me much further in life than my intellect. So my advice is to keep pressing on: Even when your knowledge fails you, persistence will kick in and help you achieve your goals.” Read more at www.asbmb.org/asbmbtoday.

To cell death.

of the Week in the Journal of Biological Chemistry.

the paper at jbc.org/site/podcast or read more at

wildtypes.wordpress.com.

www.asbmb.org/asbmbtoday.

Sweet on science

The ASBMB crew showed its love for the biosciences on Twitter on Valentine’s. Make sure to check out a roundup of the most popular #mybiovalentine tweets. Among our favorites: “Let’s ditch these chauvinist proteins and see what unfolds.” See more at wildtypes.wordpress.com.

www.asbmb.org/asbmbtoday

online exclusives

A new mechanism for cell death

Heart failure, brain ischemia and strokes have one thing in common: an intracellular overload of calcium. In a recent Paper of the Week in the Journal of Biological Chemistry, researchers described how this calcium overload comes about and leads to cell death. Listen to a podcast about the paper at jbc.org/site/podcast or read more at wildtypes.wordpress.com.
of ammonia. The partnership between plant and bacteria depends on a complicated biochemical conversation featuring flavonoids secreted by the plants and lipochitooligosaccharide nodulation factors produced by the bacteria. This is but one example of the intricate chemical interactions and negotiations that take place throughout the microbial world.

Our world has been transformed by microprocessors and other devices produced by forming structural features on micrometer or submicrometer scales within macroscopic materials such as silicon wafers. The top-down approach for materials construction can be complemented through a bottom-up approach in which individual molecules are designed and constructed so that they self-assemble into desired shapes on the scale of tens to hundreds of nanometers. The concept of molecular nanotechnology has been articulated for more than 30 years (2), but recently some of the key steps in this process have been realized after decades of detailed studies of protein structure and folding. Individual proteins with preselected structures have been designed, synthesized and characterized (3) as have self-assembling macromolecular structures (4). Molecular nanotechnology is still in its infancy, and it will be exciting to watch the anticipated developments as biochemists and other scientists push this frontier forward.

The unity of biochemistry first articulated nearly a century ago formed the basis for "A New Biology for the 21st Century," a report from the National Research Council released in 2009 (5). This report explored how developments as biochemists and other scientists push this frontier forward.

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Jeremy Berg (jberg@pitt.edu) is the associate senior vice-chancellor for science strategy and planning at the University of Pittsburgh. The ASBMB TODAY ESSAY SERIES: DERAILED but UNDETERRED DEADLINE EXTENDED TO MARCH 31

We received many wonderful entries for the essay series, which we hope to launch in next month’s issue. The stories were so good, in fact, that we’ve extended our deadline into the spring. We hope you will consider sharing your story. Visit www.asbmb.org/asbmbtoday for guidelines.

REFERENCES
The National Academy of Sciences announced awards for 18 researchers earlier this year; three of those honored are members of the American Society for Biochemistry and Molecular Biology.

Jeffrey I. Gordon of the Center for Genome Sciences and Systems Biology at Washington University in St. Louis won the Selman A. Waksman Award in Microbiology for his pioneering studies characterizing the human gut microbiome and the genomic and metabolic foundations of its impact on health and disease. The $5,000 award, given every two years, is funded by the Foundation for Microbiology.

Stuart H. Orkin of Harvard Medical School and the Dana Farber Cancer Institute won the Jessie Stevenson Kovalenko Medal for his pioneering work determining the molecular bases of blood disorders and their molecular mechanisms, work that has yielded strategies for new therapies for hematologic diseases. The award consists of a $25,000 prize and a medal.

Robert G. Messing in January joined The University of Texas at Austin as vice provost for biomedical sciences to help develop the new Dell School of Medicine. Messing, who spent more than two decades on the faculty of the University of California, San Francisco, and more than half of that time as an administrator at the Ernest Gallo Clinic and Research Center, will serve as a co-chair of the steering committee for the medical school. Messing “brings considerable expertise in building consensus across scientific disciplines,” said UT-Austin Associate Vice President for Health Affairs, Arthur S. Levine, senior vice chancellor for Health Affairs.

New members of the National Academy of Inventors

The National Academy of Inventors earlier this year granted 101 innovators NAI Charter Fellow status. Nine ASMBB members were among those inducted by U.S. Commissioners for Patents Margaret A. Fiacco and John P. Maphis.

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March 2013

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regulation of TRAF6-mediated NF-κB signaling.

Teh's work also has advanced our understanding of genetic damage in virus–cellular transformation. In 1990, he first reported that the HTLV-1 Tax oncoprotein repressed DNA repair. Thereafter, he characterized the important roles of dysregulated mitotic checkpoint and AKT activation in cellular transformation. His work contributed to the elucidation of the role played by the spindle assembly checkpoint in oncogenesis, helping to explain how the loss of multiple checkpoints alters cancer tropism in vivo.

Teh had a longstanding interest in understanding the viral and cellular factors that govern HIV-1 gene expression in infected human cells. In the late 1980s, his lab showed that HIV-1 uses an unprecedented mechanism of transcription that is dictated by an RNA-binding protein, Tat, which binds a nascent viral RNA target, TAR, the first RNA enhancing element described. Subsequently, his group characterized cellular RNA-binding proteins that regulate HIV-1 replication, including the TAR RNA-binding protein, or TRBP, that later became known as an important factor of the cellular RNA interference machinery.

His lab recently completed a genomewide screening for human cell factors needed for HIV-1 replication. Using novel technology, Teh extended his interests in RNA biology through the identification of small RNAs (i.e., siRNAs and miRNAs) that have biologically important roles in viral infection, cellular metabolism and virus-induced pathogenesis.

Despite all these accomplishments, one could argue that Teh's biggest contribution to science probably lies in his role as mentor for young scientists. Teh trained 37 international postdoctoral fellows, and seven more are in his group at the NIH today. He was a fantastic mentor of young scientists who have since spread across the globe. Many flew from Washington to attend the funeral ceremony Feb. 9. Teh was attentive, supportive and never had to wait long for reply emails. His mentoring commitment also was reflected in his many professional and society services. For instance, Teh was a standing member of the AIDS Molecular and Cellular Biology Study Section, where he had a reputation for being strongly supportive of new investigators.

Teh always had a special interest in the area of scientific publication. For instance, in 1994 he joined the editorial board of the Journal of Biomedical Science of the National Science Council of his native Taiwan. He was an avid advocate for ways to improve the journal’s impact factor. He left the journal in 2004 for an important new activity: the launch of the journal Retrovirology, in less than 10 years, became among the most-cited journals in the field. In addition, he served on the editorial boards of numerous journals, including the Journal of Virology and the Journal of Biological Chemistry.

Teh was a scientist with a vision and a broad interest in all aspects of scientific endeavors. He also was a true scientific leader, starting scientific debate, writing editorials, sitting on many committees, organizing new book volumes and organizing international meetings on diverse topics. He was president of the Society of Chinese Bioscientists in America in 2010 and voiced strong support for increasing the representation of Asian-American scientists in leadership positions.

He was the recipient of an extraordinary number of awards, most recently the International Retrovirology Association’s Dale McFarlin Award in 2011, Biomed Central’s Open Access Editor of the Year award in 2010 and the John’s Hopkins University Woodrow Wilson Award in 2009. Teh was elected to prestigious societies, including Academia Sinica in Taiwan.

Teh had an infectious enthusiasm and winner’s mentality both at work and at play. He was a skilled tennis player and chess player, a gifted writer and a great debater with strong opinions on nearly all subjects of science and life in general. Additionally, he had a passion for current events and a love of travel, movies, food and music.

Teh’s death is a blow to the retrovirus research community, and we sorely will miss his scientific leadership. He has been central to much of what we have done together as well as being a supportive and generous friend to many of us individually. Teh’s life was much too short, but his legacy and our memories of him will last forever. Our hearts and condolences are with his wife, Diane, and his three children, David, 23, Diana, 20, and John, 15.
Ulrich Hartl of the Max Planck Institute for Biochemistry and Arthur Horwich of the Yale School of Medicine have won the American Society for Biochemistry and Molecular Biology’s Herbert Tabor Research Award for pioneering work in the field of protein folding.

This award is given for excellence in biological chemistry and molecular biology research in honor of the many contributions of Tabor to both the ASBMB and the Journal of Biological Chemistry, for which he served as editor for more than four decades.

Hartl and Horwich identified and characterized a group of proteins known as chaperones, which are molecular machines that aid the process of protein folding. “These machines and their mechanics were illuminated primarily through the pioneering work by the Hartl and Horwich laboratories,” Alexander Varshavsky explained in nominating the pair for the award. “Their contributions are numerous, crucial and profoundly complementary. Moreover, some of their most important early discoveries stemmed from their direct collaboration.”

The discovery of chaperone-assisted protein folding began while Horwich was a young independent investigator at Yale University studying the machinery that imports proteins, which are imported in an unfolded state, into the mitochondria. Horwich identified a mutant where a target protein was imported properly but remained unfolded. Horwich teamed up with Hartl, an expert in mitochondrial import biochemistry who was then at the University of Munich, and they determined that the mutant lacked a protein called Hsp60. Together, they demonstrated that Hsp60 was a multisubunit 14-mer molecular machine that aided the process of protein folding in an ATP-dependent manner. They later jointly determined that Hsp60 also prevents protein aggregation by binding pre-existing proteins that are unfolded due to stress.

Although Hartl and Horwich continued to investigate the chaperones independently, their laboratories, using different but complementary methodologies, uncovered the reaction cycle for the Hsp60 homolog in prokaryotes, GroEL-GroES. Using biochemical and structural studies, they determined that the unfolded polypeptide first binds...
Specifically, the toxic polyglutamine protein aggregates that form, for example, in the huntington’s disease or spinal muscular atrophy are known to be precursors to neuronal cell death. In contrast, the GroES-GroEL complex is known to prevent the aggregation of proteins, the homolog of GroEL. Hartl also has studied how the Hsp70 prokaryotic chaperone family works in eukaryotes, proteins with multiple domains that are often too complex for their work. They shared the 2011 Albert Lasker Basic Research Award by reaching out to the deaf community and recruiting minorities to enter the sciences. Blumberg has earned this recognition for his outstanding achievements have produced crucial role models for the deaf community and have shown them and the hearing world that the deaf can go far beyond what is typically imagined,” says Stuart H. Yuspa, chief of the Laboratory of Cancer Biology and Genetics at the National Cancer Institute.

Blumberg received his Ph.D. from Harvard University in 1974. He took a postdoctoral fellowship in the laboratory of Phillip W. Robbins at the Massachusetts Institute of Technology in 1974 and in 1975 joined Harvard Medical School as an assistant professor. In 1981, he became chief of the Molecular Mechanisms of Tumor Progression section of the Laboratory of Cancer Biology and Genetics at the NIH, where he has remained since.

Blumberg will receive his award during the Experimental Biology 2013 conference in Boston, where he will deliver an award lecture. The presentation will take place at 9:05 a.m. April 21 in the Boston Convention and Exhibition Center.
Identification of overproduction of inositol, or Opi, mutants led to the identification of the OP1 gene, encoding the repressor of phospholipid biosynthetic genes and the OP3 gene encoding a phospholipid-N-methyltransferase, involved in phosphatidylycerol biosynthesis. This work led to the understanding that expression of nearly all phospholipid biosynthesis enzymes is regulated by inositol and that this regulation also requires ongoing phosphatidylycerol synthesis. More recent work from the lab has shown there is a link between inositol-containing sphingolipid synthesis and protein kinase C activation in response to low inositol levels.

Michael R. Culbertson of the University of Wisconsin–Madison, Henry’s first graduate student, says, “Because she has brought fresh thinking to the field of lipid research and because she has very likely influenced others to expand their way of thinking about this field, I believe Susan’s work is worthy of recognition.”

Henry received her Ph.D. in 1971 from the University of California, Berkeley. She did a postdoctoral fellowship sponsored by H. O. Halvorson at the Rosenstiel Basic Medical Sciences Research Center at Brandeis University and then took a position at Albert Einstein College of Medicine in 1978. In 1987, Henry moved to Carnegie Mellon University, where she served as a professor, head of the department of biological sciences from 1987 to 1991, and dean of the Mellon College of Science from 1991 to 2000. In 2000, she moved to Cornell University, where she is a professor of molecular biology and genetics and has served as dean for the College of Agriculture and Life Sciences. Henry’s work has been supported continuously by the National Institutes of Health, and she has been a recipient of the NIH MERIT award.

Henry will receive her award during the Experimental Biology 2013 conference in Boston, where she will deliver an award lecture. The presentation will take place at 8:30 a.m. April 21 in the Boston Convention Center.

**FRITZ LIPMANN LECTURESHIP AWARD**

Renowned researcher Uhlenbeck honored for work on RNA biochemistry

BY MARK STEWART

The American Society for Biochemistry and Molecular Biology has awarded Olke Uhlenbeck, an emeritus professor at Northwestern University, the Fritz Lipmann Lectureship. Awarded every two years, this lectureship recognizes investigators who contribute to the conceptual advancements of biochemistry, bioenergetics and molecular biology.

Uhlenbeck has made pivotal contributions to our understanding of RNA biochemistry. He began to define the energetics of RNA secondary structure formation as a postdoc with Nacho Tinoco at the University of California, Berkeley. His recognition that one could systematically study the effects of sequence on duplex stability led, ultimately, to “nearest neighbor” rules. This allows researchers across biology to accurately predict the stability of a given RNA duplex. Uhlenbeck further recognized that the major limitation in understanding RNA was technical — the ability to make and manipulate these molecules. In subsequent work, over the next decades, Uhlenbeck continued to innovate, providing simple and powerful solutions to these problems, solutions that were adopted by virtually every lab studying RNA. At the same time, he carried out seminal work in ribosome catalysis and tRNA function, culminating in ground-breaking work revealing an unexpected interplay between the amino acid portion of amino-acyl tRNAs and the ribosome during protein synthesis.

In a joint nomination, Daniel Herschlag of Stanford University and Rachel Green of the Johns Hopkins University School of Medicine lauded Uhlenbeck and said that many consider him “the father of RNA.” “Olke is a rare scientist who is equally excited about the results of others as he is about his own,” wrote Herschlag and Green in their nomination letter. “He has a remarkable perspective on the scientific enterprise.”

Herschlag notes that “Olke is a person you call when you have a new exciting result — to both have someone to share that enthusiasm and to find out if someone else already found that out and you missed it. The number of phone calls that Olke would get from prominent scientists — at least in the days before email — must have been remarkable.”

After completing his undergraduate studies at the University of Michigan at Ann Arbor, Uhlenbeck pursued a Ph.D. in biophysics at Harvard University in the laboratory of Paul Doty.

Thereafter, he joined the faculties of the University of Illinois in 1971 and the University of Colorado in 1986. Currently, he is the Board of Trustees professor of chemistry and molecular biosciences at Northwestern University and a member of the National Academy of Sciences. The Fritz Lipmann Lectureship provides a plaque, a $3,000 prize, and transportation and expenses to the Experimental Biology 2013 conference in Boston to present a lecture. The lecture will take place at 2:55 p.m. April 23 at the Boston Convention Center.

Mark Stewart (mdstew@uab.edu) is a Ph.D. student in the pathology department of Paul Doty.

**ASBMB–MERCK AWARD**

Malhotra recognized for work with Golgi, membrane trafficking

BY LAUREN AMABLE

Ilick Malhotra, chairman of the cell and developmental biology program at the Centre for Genomic Regulation in Barcelona, has been named the winner of the 2013 American Society for Biochemistry and Molecular Biology-Merck Award for his studies in understanding the mechanisms and machinery of membrane trafficking and Golgi function and biogenesis.

Malhotra began his research as a postdoctoral fellow in the lab of James Rothman, where he provided insight into the NSF protein in vesicle fusion and isolated the famous COPI-coated vesicles. In his nomination letter for Malhotra, Rothman said, “Malhotra is a very prominent senior cell biologist whose many contributions stand out not only in their substance but also because they are characterized by bold imagination and the development of new concepts.”

For the next 18 years, Malhotra was a professor at the University of California, San Diego. There he contributed numerous discoveries to the field. He identified a natural product from sponges called limaquinone, or IQ, which triggers the disruption of Golgi organization. These discoveries led to the establishment of the involvement of...
Dikic honored for his ‘unselfish commitment to training and to the advancement of the scientific community’

BY MARK STEWART

Ivan Dikic, professor and chairman of the Institute of Biochemistry at Goethe University, is the winner of the American Society for Biochemistry and Molecular Biology’s William C. Rose Award this year.

This award seeks to recognize individuals who have made significant contributions to our scientific understanding of biochemical and molecular biology and who have demonstrated a commitment to the training of young researchers.

“Ivan revolutionized our understanding of protein modification by ubiquination,” writes John D. Scott of the University of Washington, who nominated Dikic for this award. “Ivan’s original work unequivocally defined the molecular basis of ubiquitin decoding. He has earned the highest regards from colleagues.”

Dikic is being honored for his seminal work in deciphering the ubiquitin code and his energetic training and education of young scientists. Dikic’s work demonstrates that modifications of proteins by ubiquitin or ubiquitin-like proteins regulate their activities in many different types of signaling pathways. This has led to a greater understanding of complex diseases, such as cancer and autoimmune diseases.

Dikic also initiated and organized the Dubrovnik Conference on Molecular Signaling, which has allowed students and researchers to interact with eminent scientists from around the world.

In his nomination letter, Mark A. Lemmon of the University of Pennsylvania School of Medicine said that Dikic possesses an “active and unselfish commitment to training and to the advancement of the scientific community.”

Dikic earned his medical degree from the University of Zagreb Medical School. He later earned a Ph.D. in molecular biology at the New York University School of Medicine under the supervision of Joseph Schlessinger. After conducting two years of postdoctoral work at New York University, he began work at the Ludwig Institute for Cancer Research in Uppsala, Sweden. Today, he holds professorships at Goethe University and at the School of Medicine in the University of Split, located in his home country of Croatia.

The award consists of a plaque, a $3,000 prize and transportation to the Experimental Biology 2013 conference in Boston to present a lecture.

Dikic will present his lecture at the Experimental Biology 2013 conference in Boston at 2:55 p.m. April 21.

Nobel laureate Brian Kobilka, professor and chairman of the molecular and cellular physiology department at Stanford University School of Medicine, won the 2013 Earl and Thressa Stadtman Distinguished Scientist Award from the American Society for Biochemistry and Molecular Biology.

Kobilka’s work has been a pivotal in the discovery and understanding of G-protein-coupled receptor structures and functions. GPCRs are the largest family of proteins in the human genome and important drug targets — with about 40 percent of all medications targeting these types of receptors. However, their three-dimensional structure and conformation is notoriously difficult to uncover and study due to their large size, high complexity and instability. Kobilka’s original and creative approaches have allowed him to overcome many technical challenges that previously have obstructed progress in this area of science, and his work has revolutionized the study of GPCRs at the atomic level.

Kobilka was nominated for the Stadtman award by his Nobel Prize-winning partner Robert J. Lefkowitz at the Duke University Medical Center.

Lefkowitz said of Kobilka, “The talents that allowed Brian to achieve his recent successes in crystallizing GPCRs as well as the β2-adrenergic receptor-Gs complex were already apparent in the earliest stages of his career.

Mark Stewart (mdstew@uab.edu) is a Ph.D. student in the University of Alabama at Birmingham’s cancer biology program and works in the pathology department.

EARL AND THRESSA STADTMAN DISTINGUISHED SCIENTIST AWARD

Kobilka lauded for Nobel-winning studies of GPCRs

BY HEATHER DORAN

Heterotrimetric G proteins, protein kinase D and diacylglycerol in vesicle formation and cell-surface transportation. Malhotra’s research addressed the controversy of Golgi membrane fate during mitosis and identified a new cell-cycle checkpoint. He demonstrated that fragmentation of Golgi membranes is required for mitosis entry. The fragmented Golgi membranes then serve as templates for the formation of Golgi stacks in daughter cells.

Finally, Malhotra identified novel components in secretion after performing a genomewide screen in Drosophila. From that, he discovered a set of components necessary for Golgi structure and function. These novel genes were labeled transport and Golgi complex organization genes, or TANGOs. Aiding to the understanding of trafficking, Malhotra and colleagues recently reported unconventional protein secretion that bypasses the Golgi. This mode of secretion is mediated by autophagosome-like vesicles forming compartments called CUPS, for compartment for protein secretion that bypasses the Golgi. This mode of secretion after performing a genomewide screen in Drosophila.

By performing a genomewide screen in Drosophila.
New award established in memory of Bert and N. Kuggie Vallee

BY ANGELA HOPP

The American Society for Biochemistry and Molecular Biology is now accepting nominations for a new annual award: the Bert and N. Kuggie Vallee Award in Biomedical Science.

The $10,000 award, which will recognize outstanding accomplishments in basic biomedical research, is supported by the Vallee Foundation, established in 1996 by biochemist Bert Vallee and his wife, Natalie, who was better known as Kuggie.

The late Bert Vallee was born in Germany and immigrated to the U.S. in 1938. He studied primarily zinc enzymes and was known in many in the scientific community as the father of metallogenechemistry, but his research interests were broad, and the technologies he developed affected many areas of study.

“Vallee and I shared a common passion, our favorite element, zinc. He was one of the fathers of zinc biochemistry, having discovered the second known zinc enzyme,” says Jeremy Berg, president of the ASBMB. “Vallee and his co-workers developed many of the techniques used to this day to characterize zinc proteins. I greatly admired the interdisciplinary approach he took, well before it was fashionable.”

Vallee’s work garnered him many awards, including the ASBMB’s William C. Rose Award in 1980, and honorary degrees from institutions across the globe. When he died at age 90 in May 2010, Vallee held the Paul C. Cabot professorship of biological chemistry at Harvard Medical School.

“Bert was an outstanding biochemist. He was also a very generous person — very helpful to many people,” says Gordon Hammes, vice president and secretary of the Vallee Foundation and professor emeritus at Duke University. “He was always about basic research in the biomedical sciences and trying to eventually apply this to clinical situations. He had a number of patents, and he was particularly interested in alcoholism and, later, angiogenesis.”

The Vallee Foundation is perhaps best known for its visiting professorship program, which allows senior scientists to spend four weeks in other labs. “Bert was very interested in promoting interdisciplinary research throughout the world,” Hammes says. “If you look at the list of people who’ve benefited from the foundation, they’re from all over the world.”

Dozens of researchers, about a third of them ASBMB members, have won Vallee professorships.

“First there was a restricted number of labs (the winners could visit) because Bert wanted a lot of them to come to Harvard so he could interact with them,” Hammes says. “But gradually it expanded, and basically it’s now any good lab they want to visit. It’s a great program.”

Hammes, who was friends with Vallee for some 50-odd years and who is now retired and living in Florida, knows firsthand what a gift the Vallee professorships can be. After several successful decades at the bench, he closed his lab and served for 12 years as a university administrator, primarily as vice-chancellor for academic affairs at the Duke University Medical Center. “When I wanted to quit that job and go back into research, Bert offered me one of those fellowships. So I came to Harvard and started research in an entirely new field,” he recalls.

Kuggie Vallee also was a strong supporter of science, Hammes says. The Pennsylvania native taught biology at Lesley College in Cambridge, Mass., for 27 years. She then took an appointment at Harvard University, where she remained until her retirement in 2002. She died in November 2011.

While the traditional Vallee professorships are geared toward senior scientists, the award to be issued by the ASBMB has few requirements. The Vallees “were dedicated to science and to helping the people who do it,” Hammes says. “All the board wants is someone who is really outstanding, carrying out basic research in the biomedical sciences, from anywhere and of any age.”

Hammes says the foundation chose the ASBMB to administer the award because it has a solid track record of selecting exceptional award recipients. He notes that the foundation also is developing programs for young investigators. For more information about its various initiatives, visit www.thervalleefoundation.org.

ASBMB Today March 2013

ASBMB Today March 2013
Meet Santa J. Ono

BY WEIYI ZHAO

Santa Jeremy Ono became president of the University of Cincinnati in late October after previously serving as interim president, as senior vice president for academic affairs and as provost. He’s a professor of pediatrics at the College of Medicine and a research faculty member at Cincinnati Children’s Hospital Medical Center. Before arriving at UC, Ono was part of the administration at Emory University and a faculty member at Emory’s medical school. Ono has served on the editorial board of the Journal of Biological Chemistry. In this quick Q&A with ASBMB’s education and professional development manager, Weiyi Zhao, Ono talks about his career path and the inspiration for it.

Tell us about your current career position.

After two years of serving as the provost of the University of Cincinnati, I was selected to serve as UC’s 28th president. As the university’s chief executive, I head a top-25 public research university that enrolls approximately 42,000 students and employs about 10,000 faculty and staff members. UC has a budget of $1 billion, is completing a $1 billion fund-raising campaign and has endowment assets of nearly $1 billion.

What are the key experiences and decisions you made that have helped you reach your current position?

I have served in a variety of academic and administrative positions over the past 21 years that have given me a wide-ranging foundation as a research scientist, a teacher, an administrator and a fund-raiser. My career has taken me to Johns Hopkins University, Harvard (University), University College London and Emory. All along the way, I have drawn energy from my interaction with students, and I remain very focused on students even today.

How did you first become interested in science?

My interest in science began while I was a freshman at Towson High School in Maryland. My high-school science teacher led some experiments that caught my interest. At that time, a revolution was occurring in molecular biology. I read a book about the double helix by James Watson and heard a presentation by Johns Hopkins researcher Donald Coffey, and I was absolutely enthralled by the concept of genes turning on and off during development from two cells to a full-blown person.

Were there times when you failed at something you felt was critical to your path? If so, how did you regroup and get back on track?

Being a scientist, you fail all the time. Not all experiments work – or any field, for that matter – not to be shy about seeking the advice and guidance of seasoned scholars. Do not think of science as a solitary endeavor that you have to pursue on your own. Like most things in life, you will need the help and support of others.

Do you have any heroes, heroines or role models? If so, describe how they have influenced you.

I have several heroes and role models. One of them is Neil Armstrong, who was a faculty member at UC after he stepped down from NASA. Neil’s reluctance to take the spotlight following the historic moon walk is a reminder to us all that most accomplishments are not solo feats. They are the result of team efforts. He also inspired hundreds who came after him to pursue careers in science and technology, and I count myself among them. I also respect and am inspired by the work and courage of Rosalind Franklin, whose X-ray ultimately revealed the structure of DNA and provided the images that James Watson and Frances Crick used to complete their model of DNA. Franklin died of cancer at age 37, not fully knowing the impact that her photograph would have and not sharing in the Nobel Prize that Watson and Crick would share. Her hard work played a pivotal role in our understanding of DNA.

What advice would you give to young people from under-represented backgrounds who want to pursue careers in science similar to yours?

I had wonderful mentors who helped me all along the way, so I would encourage all young people with an interest in science – or any field, for that matter – not to be shy about seeking the advice and guidance of seasoned scholars. Do not think of science as a solitary endeavor that you have to pursue on your own. Like most things in life, you will need the help and support of others.

What are your hobbies?

I like music. Although I am not as talented as my brother, who is a concert pianist, I do enjoy playing the cello. I also like to sing and learned more about singing from a student at Emory. I like to attend concerts and musical theater shows. I also am a sports nut. I follow professional and college sports, and I play sports with my daughters in the backyard or at the Cincinnati Sports Center.

What was the last book you read?

“The Language of God: A Scientist Presents Evidence for Belief” by Frances Collins was a book that was meaningful to me because it talks about the reconciliation of one’s faith with the empirical nature of science.

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T he brutalities that I witnessed during my youth in Sierra Leone could have propelled me toward a downward-spiraling path. My homeland was ravaged with violence and inhuman treatment as civil war broke out in 1999. Murder, rape and amputations were among the countless heinous crimes that I witnessed as an 11-year-old; these memories will haunt me forever.

Many families were torn apart. My family was not left unscathed by the violence, as my older sister was among the many girls who were kidnapped. After being raped and left to die, she somehow managed to survive but later developed a cardiac problem due to poor living conditions and unmet treatment as civil war broke out in 1999. Murder, rape and amputations were among the countless heinous crimes that I witnessed as an 11-year-old; these memories will haunt me forever.

After I graduated from high school with high academic standing, I continued nursing my passion to pursue a medical career by enrolling in a medical assistant program as well as interning at a private clinic. Unfortunately, I had to relocate again before I was able to complete the program. In 2005, I moved to the United States with only $750. I did not know what obstacles and challenges awaited me as I navigated the busiest streets in New York City. Six months later, while staying with one of my elder sisters in the Bronx, I was fortunate to get a job as a waitress and bartender at a restaurant in Brooklyn. Two years later, I worked out my immigration situation and enrolled at a community college, where I obtained an associate’s degree as a medical assistant and graduated summa cum laude in 2009.

In 2010, I enrolled at Long Island University to pursue my bachelor’s degree in biology and a minor in chemistry. During my junior year, I encountered some difficulties in one of my classes; nonetheless, I worked hard on a daily basis, because success is when a person fails and is able to bounce back up and do it again. My grade point average improved considerably the following year.

At LIU Brooklyn, I have been a member of the Minority Biomedical Research Support/Research Initiative for Scientific Enhancement, which enables me to conduct numerous research projects in various areas of study. The MBRS/RISE program is designed to target minority students who show an interest in biomedical research. My LIU research has been featured on the local television and in publications from New York to Africa.

I am working with my mentor, Dong Xiong, at my home institution. My role in that research project is to examine the effects of polyamines on β-lactam antibiotics in Pseudomonas aeruginosa, a gram-negative, opportunistic bacterium that causes severe nosocomial infections in healthcare settings. This is an ongoing project that will be published early this year, and I will continue experimenting during my senior year.

In addition, under the excellent mentorship of Lisa Shantz at the Penn State Milton S. Hershey Medical Center, I participated for 10 weeks in the 2012 Summer Undergraduate Research Intensive Program. My project entailed investigating the mammalian target of rapamycin, or mTOR, which plays an important role in cell proliferation and survival. Based on previous research, we hypothesized that mTOR is a useful target in the prevention and treatment of nonmelanoma skin cancer. My aim was to test the effects of another drug, called Torin-2. While rapamycin inhibits only mTORC1, Torin-2 can inhibit both mTORC1 and mTORC2. Therefore, I examined the effects of Torin-2 and through extensive research, our lab was able to make significant breakthroughs, which are in the process of being published.

My strong interest in medicine has directed me in eagerly pursuing a combined degree that will enable me to achieve my unshakable goals of practicing medicine and conducting research. The ability of the scientific world to discover and make progress through research experiments that eventually lead to the development of new treatments in vast areas of science has fortified my desire to pursue a career as a physician–scientist.

Though I’m a full-time student, I also have two jobs to support my family in Africa and maintain a decent life here in New York. I am working as a medical assistant and as a restaurant manager. Jobs to support my family in Africa and maintain a decent life here in New York. I am working as a medical assistant and as a restaurant manager. Being a medical assistant at a private clinic and working at a research lab has made me appreciative of both medicine and biomedical research. Conducting office procedures and assisting the doctor as well as interacting with patients and performing research experiments has left within me a deeper desire to pursue the combined degree. I have acquired a deeper understanding of medicine through scientific discovery. Through this academic journey, I’ve learned that scientific research is bigger than just the lab; it’s about making your contribution to the world so that the people of tomorrow can live better lives.

All the trials and tribulations that I went through have made me stronger and have encouraged me to make a difference in the world.
Undergraduate-driven science outreach

University of Arizona program shows high-school students that high-tech degrees actually are not beyond their reach

The University of Arizona’s Visiting Scholars Program, established in 2011, sends undergraduates out into Tucson-area high-school biology and chemistry classes to discuss their research projects and talk about university life. On most outings, one student gives a presentation about his or her work, and the other takes photos and helps answer questions. The following are brief reflections, edited for length and style, from members of the American Society for Biochemistry and Molecular Biology’s Undergraduate Affiliate Network who are participating in the program and from their adviser, James T. Hazzard.

JAMES T. HAZZARD, PROGRAM ADVISER

One of the joys of being a faculty adviser for a UAN chapter is working closely with undergraduates to establish beneficial and viable outreach activities, like the VSP, in which students discuss their research — a requirement for all the biochemistry majors at our institution — and engage the high-school students in a dialogue about the college experience.

The inspiration for the VSP came primarily from two observations. First, since the inception of our annual undergraduate research conference, a number of high-school students have presented very sophisticated posters describing their research, which is often being done on our campus. Second, for a number of years our department hosted a one-day event in which high-school students from across Arizona were invited to a series of presentations and visits to research laboratories. I noted that high-school students were reluctant to ask an older faculty member, such as me, questions about preparing for and surviving college. My suspicions were also strengthened by seeing the inhibitory effects of the cool factor in two teenage granddaughters. Dutifully taking a scientific approach to this problem, we developed a working hypothesis that the high-school students would be much more willing to engage openly in conversations with UA students. Fortunately, not all hypotheses are disproved!

Now that our fall semester has ended, we are reflecting on how to continue to improve the VSP. As a faculty adviser, a serious concern for such an outreach activity is its future viability. Although the present group of students has engaged in the activity enthusiastically, there is no guarantee that volunteers will continue to step forth consistently. Therefore, we have begun to convert our all-volunteer activity into a formal class for academic credit — always a good carrot.

Our model for this transition is the outstanding outreach program established by Hannah Alexander of the University of Missouri. Whereas Science and Me targets an older audience, we will continue to engage high-school students, especially those likely to be the first in their families to attend college, let alone pursue careers in the science, technology, engineering and math disciplines.

Additionally, calling upon the diverse nature of research in which our biochemistry students are engaged, we will shift the focus of attention of our talks away from the specific details of the students’ research, which often exceed high-school students’ background knowledge, to topics of more general public interest. Finally, we plan on offering formal training in effective public speaking practices to the undergraduate participants as well as designing more sophisticated assessment tools.

As we continue to refine and develop our outreach activity, we are confident that the VSP is a worthy project that benefits not only the target audience but also the undergraduates. Putting together a talk about topics that are often scientifically quite sophisticated in a manner that people with a smaller degree of technical expertise can understand requires a great deal of thought and careful planning. Hopefully, participation in the program enables our outstanding students to speak professionally and eloquently to the general public.

ANGELA SCHLEGEL, VSP PARTICIPANT

As a senior biochemistry major, one thing I have been able to do through the VSP and other outreach programs is to give back for all the help and opportunities I’ve received. As a high-school student at Tucson Magnet High School, part of my motivation for choosing to pursue a career in science came from the opportunities I had to conduct lab experiments through my school’s Research Methods program. It piqued my fascination with research at the UA. I benefited from the mentorship of both the UA students and faculty.

The VSP has allowed me to take on mentor roles at local high schools.

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The VSP has allowed me to take on mentor roles at local high schools.

SHIANA FERNG, VSP PARTICIPANT

For me, most impressive was the large number of detailed, thoughtful questions the students had about my translational research on Parkinson’s disease. In the second of the two classes I presented to, I did not finish my presentation because of the number of great questions the students had; when the bell rang for lunch, several of the students immediately clamored for permission to stay longer so I could finish. After I finished my presentation, a group of students wanted to take a closer look at the research poster that I presented at last April’s ASBMB annual meeting, giving me the opportunity to explain the poster-making process. At the end of the visit, the teacher whose biology class we visited expressed a strong interest in having us return to give more presentations in the future and even asked about scheduling a lab tour or activity for his biology students.

JOEY QUIROZ, MEMBER OF THE INAUGURAL VSP COHORT

Our program aims to visit numerous high schools in the Tucson area, including those with large populations of underrepresented minorities in science. While visiting Flowing Wells High School, which has a diverse student body and a large Hispanic student population, I asked each student what his or her plans were after college; the majority of the students answered that they wanted to work in construction or as salesmen or were undecided. Not one of the students was interested in or even knew about careers in science.

Fortunately, when my question-and-answer session ended, a young man came up to thank me and said, “I didn’t know there was so much one could do in science.”

* See the December 2011 issue of ASBMB Today for a feature by contributor Melody Kroll on the University of Missouri’s Science and Me program.
WHY YOU SHOULD JUDGE POSTERS

Your abstract for the American Society for Biochemistry and Molecular Biology annual meeting is in, and you’re starting to put together your poster or presentation. You’ve made your travel arrangements and are about to get back to preparing for this afternoon’s lab when you notice an email inviting you to serve as a judge for the undergraduate poster competition. We’re hoping to convince you to join us by telling you how the process works and about the benefits that we have received by participating.

THE PROCESS

11 A.M. SATURDAY: ORIENTATION
Meet the other members of your group, and get a packet of abstracts and scoring sheets for five to six students.

SESSION 1: 1.5 HOURS LONG
First half of the posters are judged.

SESSION 2: 1.5 HOURS LONG
Second half of the posters are judged.

4:30 P.M.: WINNER SELECTION
Judges select the prize winner and four honorable mentions for each category. Selection is complicated because not everyone viewed every poster.

THE CATEGORIES

- Cell Signaling
- Nucleic Acids
- Proteins & Enzymes
- Systems Biology

THE RUBRIC

quality of scientific content
poster quality
presentation quality
ownership of the research
ability to answer questions

SPECIAL CIRCUMSTANCES

Picking the winners can be challenging. In the Systems Biology category last year, we used a matrix approach. We asked each pair of judges to add up the points from the scoring rubric for each poster.

- When we totaled the points, we were concerned about inherent bias. Students with more generous judges would receive more points, for example. To cope with this, we asked each judge to select his or her top five posters.
- We then considered the posters that had received the highest points, and asked how many of the judges had viewed a specific poster and determined what percentage of judges had that poster among their top five list.
- This was followed by further discussion in which the judges assigned to each of the top posters were asked to advocate for their posters. We went around the circle until all posters that were considered exceptional had been discussed.

This was somewhat like a study section, in which posters received preliminary scores and were then defended by those who viewed them. It was an interesting negotiation. In the end, we arrived at a consensus for the winning poster and the four honorable mentions.

Even with the time limitations, we were confident that each award winner had done a superb job.

THE BENEFITS

- Students gain experience presenting to professionals in their field, meet a network of peers from other institutions, and encounter new perspectives and new knowledge for their ongoing research. In addition they get to compete with their peers from across the country and have their work evaluated by experts from outside of their home institutions.
- They get to meet graduate-school recruiters and may encounter potential future mentors.
- Undergraduate advisers receive outside perspectives on the work their labs are conducting. While this does not always yield useful information, in more than one instance students have received feedback that has been used in directing new research questions.
- Judges meet and offer advice to new students. In addition, judges learn how to assess scientific research (especially good for those early in their careers), learn how others judge scientific research (helpful for preparing grants), see new educational and research approaches, build relationships with each other and with students, and support the ASBMB.

TIPS FOR POSTER-MAKERS

1. Make sure the text and figures are easily viewed from 3 to 5 feet away.
2. Font matter: the smallest font size should be 24 points, but try to use fonts larger than 32 points. Titles should be 72 points or 96 points. Use only one font on your entire poster. Don’t make it Comic Sans MS — you want people to take your science seriously.
3. Use figures with clearly labeled axes. Tables are a second choice. Neither figures nor tables should be overly complicated.
4. This is a poster — not a paper. Use text effectively and sparingly.
5. Simplicity is good. Use white space to guide the reader’s eyes. Colored background images look clever but can be very distracting.

SUMMARY

Judging posters requires a few hours of extra work, but it can be very rewarding. You should participate if your students are presenting, but you also should consider participating any time you attend a meeting. It also leads to new collaborations and friendships — the authors of this article met at the 2012 competition.

OVERHEARD AT PAST POSTER COMPETITIONS

“I was pleasantly surprised at the level of sophistication of many of the students.”

“I was impressed by the way the student presenter described how the positive and negative controls established the validity of the experimental results.”

“They tried to cram too much into their poster. Even standing only a couple of feet away, I strained to read the small font they used.”

“I really liked the way the poster was organized, with a brief introduction stating the objectives of their project, a clear description of the design and rationale for each experiment, and a nice summary at the end.”

“The students had a clear grasp of the strengths and weaknesses of the experimental approach.”

“It was obvious that the student owned the project and had a deep understanding of the central question being asked.”

“The student conducted all of the experiments discussed and was able to tell me details of each technique.”

“The student presenting the poster on PCK isoforms was working for a postdoc and of the data presented had performed only one Western blot.”

“The student had a well-thought-out line of investigation. I could follow how one experiment led into the next one.”

“Have you considered applying to grad school?”

“Have you considered applying to grad school?”

March 2013

ASBMB Today

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ASBMB Today
of Abl kinases influence inhibitor compatibility. This mini-
review explores how the Ncap region and the SH2 and
SH3 domains function to regulate Abl kinase activity, the
kinase domain and how its interaction with other proteins
is controlled, and the conformational changes that the kinase
undergoes upon activation or inhibition. The authors also
discuss how the lessons learned about the Abl family from
structural studies can be applied to the oncopgenic fusion
protein Bcr-Abl; it lacks the Ncap regulatory region and
possesses a coiled-coil domain at the N-terminus that is
believed to play a role in activation.

“Future drug-discovery efforts targeting allosteric mecha-
nisms unique to this kinase system may provide a path to
exceptional inhibitor sensitivity,” the authors write in the
minireview, titled “Structure and dynamic regulation of Abl
kinases.”

Kyeorda Kemp (kyeordakemp2010@u.northwestern.edu) is a
postdoctoral researcher at Northwestern University.

MCP MOLECULAR & CELLULAR PROTEOMICS

A monkey cup protease for hydrogen-deuterium exchange mass spec

BY RAJENDRAN MUKHOPADHYAY

How can monkey cups help proteomics? A recent paper in
Molecular & Cellular Proteomics describes a special pro-
tease derived from this leaf of a carnivorous plant. The pro-
tease may be useful for determining protein structures and
mapping protein interactions, particular those of intrinsically
disordered proteins.

Monkey cups are special leaves on an insect-eating plant
called nepenthes. These leaves catch water to drown
insects. Once a victim has been caught in a cup, the plant
secretes digestive juices, which include the protease, into
the water to break down the insect and absorb its nutrients.
However, rainforest monkeys have caught on that these
secretes digestive juices, which include the protease, into
the water to break down the insect and absorb its nutrients.

So when the investigators came across the monkey
cup protease called nepenthesin, they were intrigued by it,
because it could perhaps overcome the drawbacks with
pepsin. “We were surprised to find that nepenthes extracts
are very poorly characterized, and only a handful of studies
exist. What evidence there was suggested it was worth a
look,” says Schriemer.

The investigators grew a few nepenthes plants in their
lab, fed them fruit flies to induce secretion of digestive
juices, collected those juices, and isolated the protease.

Schriemer and colleagues then tested nepenthesin in
the place of pepsin. They found they could “now look at
larger protein complexes and expect to get better sequence
coverage,” says Schriemer. The protease “really extends the
reach of the method and gets us closer to a proteins-
grade version of the technology.”

In particular, nepenthesin can better handle intrinsically
disordered proteins than pepsin, which doesn’t deal well
with disordered proteins. “We have many people asking for
the enzyme!” says Schriemer.

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senior science writer for ASBMB Today and the technical editor for
the Journal of Biological Chemistry. Follow her on Twitter at www.
twitter.com/rajmukhop.

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Fat-specific protein 27 and obesity, diabetes

BY MARY L. CHANG

In the March issue of the Journal of Lipid Research,
two groups independently present research on fat-
specific protein 27, or FSP27, which in mice plays a key role
in lipid storage and mitochondrial activity in fat cells.

Localized to lipid droplets and highly expressed in adi-
pose tissues, FSP27 is the mouse equivalent to the human
cell-death-inducing DFFA-like effector c, or CIDEc. Mice
with the gene for this protein knocked out expend energy
faster and are resistant to both diabetes and obesity, even
when fed a high-fat diet. Understanding how this protein’s
expression is controlled could lead to breakthroughs in pre-
venting these often-deadly conditions in humans.

For the first JLR paper on this topic, Anna Viäl Brau and
colleagues from the University of Barcelona studied the
protein’s activity in the liver and discovered that fasting
could regulate the activity of its gene in a time-dependent
manner. In the early stages of withholding food from the
mice, Fsp27 gene expression increased, but as time went
on, the expression decreased. They also showed that
downregulation of the fatty-acid oxidation rate regulates
Fsp27 expression.

While attempting to determine which transcriptional fac-
tor was controlling activation of the Fsp27 gene, they ruled
out peroxisome proliferator-activated receptor α’s (PPARs)
involvement. Instead, they observed that cyclic adenos-
ine monophosphate response element binding protein,
or CREB, was the activator. Decreased Fsp27 expression
also was linked to deactivation sirtuin 1, or SIRT1, and
the researchers suggest SIRT1 also could mediate the effect
of fatty-acid oxidation, which in turn regulates Fsp27 expres-
sion.

In an accompanying commentary, Vishwajit Puri of the
Boston University School of Medicine notes that PPAR-α’s
noninvolvement was a surprise, given that it is known as
a master regulator of fasting in the liver. Puri explains that
Viäl Brau et al.’s results support a new model: upregula-
tion of Fsp27 by a CREB-dependent pathway, followed by
fatty-acid oxidation increasing SIRT1 activity. When lipids
are broken down, fatty-acid oxidation is enhanced; when
fatty-acid oxidation is inhibited, FSP27 activity increases.
lipid news

Controlling lipid synthesis to control cell growth?

Nongenomic regulation of lipid synthesis by the protein c-Fos

BY BEATRIZ L. CAPUPTO

Lipids – phospholipids, glycolipids, cholesterol and so forth – are the most abundant molecular species of every cell membrane. Consequently, it is expected that their synthesis be synchronized with the cell’s diverse functional states. In cells actively involved in proliferation or in plasma-membrane extension processes that demand massive membrane biogenesis, lipid biosynthesis rates must be higher than those rates in cells that are neither dividing nor actively growing. However, the nature of the regulatory events underlying such processes is poorly understood. We have shown that the protein c-Fos is actively involved in these regulatory events.

c-Fos has been described more than 15 years ago as a member of the AP-1 family of transcription factors (1). c-Fos content is highly regulated in cells: It is at the limit of detection in quiescent cells, whereas its expression is induced rapidly and only transiently when cells are stimulated to re-enter the cell cycle (2).

It has been hypothesized that this AP-1 activity of c-Fos (forming dimers with other members of the AP-1 family of transcription factors) participates in transmitting short-term, growth-promoting cellular signals into longer lasting changes by regulating the expression of cell-growth-related genes (2).

We have established that c-Fos is a moonlighting protein capable of regulating growth not only by its transcriptional activity but also by its capacity to act as a cytoplasmic activator of the biosynthesis of lipids in normal and pathological cellular processes that demand high rates of membrane biogenesis. Such is the case in light of the importance of c-Fos-activated lipid synthesis in normal and pathological cell proliferation and proliferation, we are studying which lipid synthesis pathways c-Fos regulates and the enzymes involved. Perhaps we will learn how to limit the unrestricted proliferation and growth of tumor cells.

REFERENCES

FRET measures molecular proximity of less than 10 nm, a range of distance that is typical of protein-protein interactions. In the micrographs, a pseudocolored cell in the upper row shows the association of co-expressed YFP-tagged c-Fos (c-Fos) with the CFP-tagged enzyme CDS1 (CDS1) at the perinuclear endoplasmic reticulum evidenced by FRET (red) between the fluorophores. The lower row shows a cell co-expressing the CFP-tagged enzyme PIS1 (PIS1) and YFP-tagged c-Fos. Note the absence of positive FRET values (blue) and hence the lack of association between c-Fos and PIS1.

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Puri suggests that the next big question is how fatty-acid oxidation induces SIRT1 activity.

In the other paper about FSP27, Masami Ueno and researchers from the Veterans Affairs Palo Alto Health Care System and Stanford University offer their findings on FSP27’s role in lipid-droplet homeostasis. They used a yeast two-hybrid system, positively identifying a direct interaction between FSP27 and the N-terminus region of nuclear factor of activated T cells 5, or NFAT5, which turns on osmoreproductive and inflammatory genes after the nuclear factor is transported to the nucleus. Through indirect immunofluorescence, the researchers showed that FSP27 can inhibit NFAT5’s travel to the nucleus in a hypertonic environment.

Using a reporter-gene construct, they demonstrated that FSP27 negatively affects NFAT5’s transcriptional activity, which is complementary to reverse transcription-polymerase chain reaction, or RT–PCR, results showing that Fsp27 overregulation inhibits endogenous chemokines that activate the immune response and tumor-necrosis factor α. Obesity and type 2 diabetes have been linked to a chronic, low-grade inflammatory process in the body, and an increased amount of chemokines are expressed in adipose tissue of those with these conditions. So FSP27’s activity and any abnormal process causing overexpression of its gene is of paramount importance to understanding what’s happening when these conditions stress the body.

Mary L. Chang (mchang@asbmb.org) is managing editor of the Journal of Lipid Research and coordinating journal manager of Molecular and Cellular Proteomics.
There and back again

From scientist to CEO

By Elizabeth Iorns

S

ometimes it’s easy to forget that, although the fruits of research are universally applicable, the process often is locally constrained and determined. I discovered that fact firsthand when I moved from my doctoral work at the Institute for Cancer Research in London to a postdoctoral position at the University of Miami in Florida.

At the ICR, we had an incredibly integrated (and, I now realize, incredibly uncommon) group of scientists and facilities. If I was working on something that required medicinal chemistry or human pathology, I easily could find the right expertise in-house and hand off that component of my project. As a result, I witnessed work at the ICR proceed very quickly from laboratory discoveries to late-stage clinical trials, not realizing that is not how most of biomedical research operates.

As a postdoc in Miami, I was developing a mouse model of breast cancer metastasis in which I injected human breast cancer cells into immunodeficient mice. Because of their different cellular origins, I could analyze both the gene-expression profiles of the human tumor cells and the mouse tumor microenvironment, which provided some very interesting results. I wanted to follow up on some intriguing gene-expression differences with a straightforward tissue microarray analysis. This was a simple thing to have performed by an expert; the hard part was finding said expert. I tried going through my colleagues, I discovered that the norm in these situations is either to do it yourself or move on to some other aspect of the study that you can do yourself. And that made no sense to me. Why shouldn’t access to expert scientific services be as easy as access to reagents or instruments? Why should the progress of scientific research be dampened by the vagaries of local availability and informal networks rather than lifted by the global state of the art?

Frustrated, I talked over my problems with my husband, Dan Knox, who was an executive at a personalized news website. We realized that the problem I was experiencing was one that has been solved routinely for all kinds of goods and services that are readily available in online marketplaces. So we recruited a Web developer, Ryan Abbott, to our cause and launched Science Exchange. Science Exchange is an online marketplace for scientific experiments where researchers can order experimental services from specialist providers at more than 400 institutions, including the University of Southern California, Harvard University, Duke University and the University of California, Los Angeles. We moved across the country from Florida to California and were lucky enough to be accepted to the Y Combinator incubator program, which aids the development of technology startups by providing seed funding as well as advice and introductions to investors.

Science Exchange isn’t even two years old yet, and we already have more than 1,000 scientific service providers from institutions around the world available on our site. I finally found a core facility at another institute to help, I discovered that it was no easy matter to pay them!

In talking with my friends and colleagues, I realized that the norm in these situations is either to do it yourself or move on to some other aspect of the study that you can do yourself. And that made no sense to me. Why shouldn’t access to expert scientific services be as easy as access to reagents or instruments? Why should the progress of scientific research be dampened by the vagaries of local availability and informal networks rather than lifted by the global state of the art?

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Are scientists with disabilities the forgotten underrepresented minority?

BY SQUIRE J. BOOKER

The U.S. has recognized that maintaining its status as a leader in innovation and discovery requires that it tap all potential educators and researchers in the science, technology, engineering, and mathematics disciplines. The diminishing employment opportunities in the once-strong manufacturing sector and the increasing number of opportunities in the technology sector suggest a vital need to support STEM training to maintain a robust workforce for continued economic growth and investment. Given that certain racial and ethnic minorities have been historically underrepresented in STEM, these groups have been targeted with strategies to increase their numbers. However, it is becoming increasingly apparent that the disabled are also a rich source of talent that has been underutilized.

The traditional definition of a disabled person referred to someone who required routine use of a wheelchair or who was visually or hearing impaired. Now the definition has been broadened to include people with learning disabilities and psychiatric disorders. A 2011 study by the National Science Foundation of students and employees in science and engineering showed that the disabled consistently have higher unemployment rates than those of the general population (1), and many leave the labor force prematurely. Furthermore, it is believed that disabilities are underreported for fear of discrimination.

Much of the past discrimination against the disabled in science has been rooted in misperceptions that they cannot work successfully in a lab environment. However, laws that ensure equal access for the disabled as well as advances in technology have enabled them to perform at the highest echelons of the scientific establishment. We marvel, for example, at the genius of Stephen Hawking, who has provided penetrating insight into the deepest workings of the cosmos despite having Lou Gehrig’s disease. John W. Cornforth, who acquired his disabilities but acquired them at some point in their lives, would have been wasteful to have them leave the scientific labor force or STEM majors after many years of personal and societal investment in their education and training when adjustments can be made to accommodate them. Efforts must be continued to create welcoming and accessible environments for them.

Given that most disabled people were not born with their disabilities but acquired them at some point in their lives, it would be wasteful to have them leave the scientific labor force or STEM majors after many years of personal and societal investment in their education and training when adjustments can be made to accommodate them. Efforts must be continued to create welcoming and accessible environments for them.

For example, the National Cancer Institute named the winner of this year's Ruth Kirschstein Diversity in Science Award, Blumberg is an internationally recognized expert in the field of cell signaling and has made an enormous commitment to the training and mentoring of scientists who are hearing impaired. To learn more about Blumberg, see page 12.

Squire J. Booker (sjb14@psu.edu) is associate professor of chemistry and associate professor of biochemistry and molecular biology at The Pennsylvania State University. He is also chairman of the ASBMB Minority Affairs Committee.

REFERENCE

MDEG hyperactivation and caspase-8 activation

Wei-Xing Zong of Stony Brook University talks about his group’s Journal of Biological Chemistry Paper of the Week: “Hyperactivation of the mammalian degenerin MDEG promotes caspase-8 activation and apoptosis.” The paper and interview investigate how misregulation of the degenerin family of ion channels leads to cell death.

Parkin deficiency and myocardial infarction

Åsa Gustafsson from the University of California, San Diego, talks about her JBC Paper of the Week, “Parkin Protein Deficiency Exacerbates Cardiac Injury and Reduces Survival following Myocardial Infarction.” The paper delves into the cardiac defects brought on by a protein involved in Parkin’s disease.

Best of the JBC for 2012

Twenty-two JBC papers — out of the more than 4,000 published last year — won Best of 2012 designations. This podcast features a conversation between JBC Associate Editor Joel Gottesfeld of The Scripps Research Institute and John M. Denu of the University of Wisconsin-Madison, who authored two papers given the designation. All of the Best of 2012 papers are freely available at jbc.org.

Letter to the editor

I want to thank Fred Maxfield for his thoughtful mentoring column in the January issue about what we as individuals and what educational institutions can do to make science students aware of the many career options available to them. Clearly ASBMB has a role in this process as well. This month ASBMB is sponsoring two regional career symposia, one at Stony Brook University in New York and one at the University of Cincinnati in Ohio. Three more will be announced soon, and information on past events is available online as well. I encourage undergraduate and graduate students — and their advisers — in those regions to consider attending these symposia to broaden their professional networks and to hear from people with science backgrounds who are applying their skills and knowledge in various fields. We also encourage institutions to use information from past meetings as a source of topics and speakers to develop local meetings on their campuses. All ASBMB members can play a role and mentor local students and postdocs who apply to host ASBMB-sponsored career meetings in their areas in the next call for applications.

– TERRI GOSS KINZY, UNIVERSITY OF MEDICINE AND DENTISTRY OF NEW JERSEY

ROBERT WOOD JOHNSON MEDICAL SCHOOL

Squire J. Booker (sjb14@psu.edu) is associate professor of chemistry and associate professor of biochemistry and molecular biology at The Pennsylvania State University. He is also chairman of the ASBMB Minority Affairs Committee.

REFERENCE
Poison
Online they say no one knows you’re a dog
Whether you tweet or post or comment or blog
Action so thick it all becomes a fog
Who are you, why you think that you’re a vital cog?
Do you talk with facts?
Or just grind your ax?
Speak your mind?
Bust a rhyme?
Waste my time?
Join the slime

What I hear in my ear it don’t sound too clear
This one says pray and that one says fear
You my peer? Far or near? Telling lies or sincere?
Is your story allegory or should I shed a tear?
All the words that you write will all disappear
Talk at me in circles and still I end up here
Poison

Internet shouters
Can’t get no louder
Trust your router
Silence the doubter

Exclaim, emphasize, create, capitalize
Retweet, reply, shake your head, realize
Hashtags, dislikes, snark shown in all size
Come in peace, come in truth or just antagonize

The right to write whets your appetite
Pounding at the keys all day and night
Logic as a metaphor
Going to settle a score
I am right, you are wrong, repeat repeat
Yet from here in my seat it’s all just empty heat
Poison

Got new toys to make signal from noise
Everyone’s wired, all the girls and boys
iPhone, iPad, laptop, Android
So how’s the real world supposed to be employed?
Online, you shine, might be a big star
But you know you only famous as an avatar
What happens if you meet
Your idol on the street?
Will it match your dream
Or leave you incomplete?

Are fact and fiction cool or do they spar?
Does what you say define who you are?
Sheltered from revenge, commenting from afar?
Verbal or physical, it leaves the same scar

So just remember when you trying to rally the herds
Comrades or crazies or jocks or nerds
How the virtual world makes reality blurred
And heed the danger of the poison of words
Poison

Poisoning with Words

Poison
Online they say no one knows you’re a dog
Whether you tweet or post or comment or blog
Action so thick it all becomes a fog
Who are you, why you think that you’re a vital cog?
Do you talk with facts?
Or just grind your ax?
Speak your mind?
Bust a rhyme?
Waste my time?
Join the slime

What I hear in my ear it don’t sound too clear
This one says pray and that one says fear
You my peer? Far or near? Telling lies or sincere?
Is your story allegory or should I shed a tear?
All the words that you write will all disappear
Talk at me in circles and still I end up here
Poison

Internet shouters
Can’t get no louder
Trust your router
Silence the doubter

Exclaim, emphasize, create, capitalize
Retweet, reply, shake your head, realize
Hashtags, dislikes, snark shown in all size
Come in peace, come in truth or just antagonize

The right to write whets your appetite
Pounding at the keys all day and night
Logic as a metaphor
Going to settle a score
I am right, you are wrong, repeat repeat
Yet from here in my seat it’s all just empty heat
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Got new toys to make signal from noise
Everyone’s wired, all the girls and boys
iPhone, iPad, laptop, Android
So how’s the real world supposed to be employed?
Online, you shine, might be a big star
But you know you only famous as an avatar
What happens if you meet
Your idol on the street?
Will it match your dream
Or leave you incomplete?

Are fact and fiction cool or do they spar?
Does what you say define who you are?
Sheltered from revenge, commenting from afar?
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Professional Development for Graduate/Postdoctoral Trainees
Saturday, April 20

ASBMB Opening Reception
Saturday, April 20, immediately follows the Opening Lecture

Undergraduate Orientation: A Student’s Guide to the ASBMB Annual Meeting
Saturday, April 20

17th Annual Undergraduate Student Research Poster Competition
Saturday, April 20

Beyond College: Coping with Some Common Challenges
Undergraduate workshop, Saturday, April 20

Undergraduate Breakfast with ASBMB Award Winners
Sunday, April 21, and Monday, April 22

ASBMB Welcome and Networking Reception
Sunday, April 21

ASBMB Thematic Fermentation Happy Hour
Monday, April 22

ASBMB Women Scientists Networking Event
Tuesday, April 23

Y.E.S. Mixer (Young Experimental Scientists)
Consult program for details

THEMATIC SESSIONS

Catalytic Mechanisms
Chemical and Systems Biology
Genome Replication and Repair
Glycan Regulation of Signaling Pathways
Lipids and Membranes
Mechanisms of Gene Transcription and Regulation
Mechanisms of Signal Transduction
Protein Modification, Trafficking and Degradation
RNA Function and Protein Synthesis
Transitions, Education and Professional Development
Triple Negative Breast Cancer

HOUSING
DEADLINE: March 22, 2013

Boston ASBMB ANNUAL MEETING
April 20–24, 2013
www.asbmb.org/meeting2013

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