

Greetings!

Greetings from all of us in Biochemistry/Biophysics at OSU. We know it has been a while since we've been in touch. If absence makes the heart grow fonder, then perhaps you will appreciate this even more. We have lots of news to report since we were last in touch, so let's get started. First, the department has been on a bit of a growth spree of late. Probably the "biggest" piece of news has been the addition of the new Linus Pauling Science Center (LPSC) immediately to the west of ALS. Completed in the fall of 2011, the LPSC is now home to many LPI investigators, including BB faculty members Balz Frei, Tory Hagen, Fritz Gombart, and Viviana Perez.



That last name may be new to you. Viviana joined us in 2012 as part of the Healthy Aging Program and uses naked mole rats in her work. Speaking of new faculty members, we also added Dr. Ryan Mehl who came to us from Franklin and Marshall. Ryan's work on incorporation of unnatural amino acids into proteins is now part of a new EHSC core facility run on the second floor of ALS. Also adding to our ranks recently was Dr. Colin Johnson, who studies proteins involved in membrane trafficking events. Most recently (in the past two weeks), Dr. David Hendrix has come to us in a joint appointment with Electrical Engineering and Computer Science. At the instructional level, Kari van Zee has joined us as an instructor. We are delighted to have everyone here.

Amazingly enough, since the last newsletter, no one has retired or left our department, so we have seen a net increase in faculty in BB for the first time in many years. This is important because both OSU and the BB undergraduate major have grown significantly in the past few years to 26,000 and going on 200 students, respectively.

We've had a leadership change since the last newsletter. Andy Karplus stepped down as chair at the end of his 3.5 year stint and Gary Merrill took over in 2010 and keeps busy between the many meetings he must attend as Chair and running a lab full of undergrads.

Andy has been organizing, for the past few

years, a departmental hike to various locations in Oregon. Last year, the group went to Belknap Crater and took the beautiful picture below.

BB faculty have been recognized with a variety of awards of late. Andy Karplus received the Gilfillan Award from the College of Science last fall and Indira Rajagopal was named an Eminent Professor of the University Honors College. Joe Beckman was named an OSU Distinguished Professor, joining fellow BB faculty Chris Mathews, Ken van Holde, Don Reed, and Balz Frei in that honor. Joe also

received the prestigious MRF Discovery award last fall. Kevin Ahern received the NACADA national advising award earlier this year and Jeff Greenwood has been named a national Mentor of the Year by the Council of Undergraduate Research.

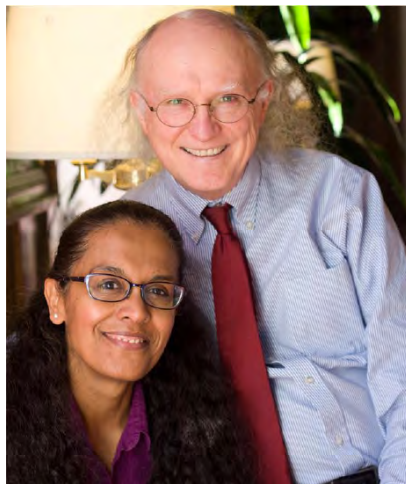
Speaking of Chris Mathews, he and Ken van Holde along with two non-OSU folks, have a new edition of their popular Biochemistry textbook out. Also on the subject of textbooks, Kevin Ahern and Indira Rajagopal teamed up for a new electronic biochemistry textbook called "Biochemistry Free and Easy" they are giving away for free on the Internet. Over 42,000 copies are now in student hands.



Undergraduate News

Indira and I (and the rest of the faculty) are always happy to hear back from our distinguished undergrad alumni. Since our last newsletter, we've had so many connections and pieces of news that we're pretty sure we're overlooking some of them. Please forgive us if we did not mention some of your news.

First, we have a bunch of new MDs and Ph.D.s to report. MDs include Dr. Nancy Lee, Dr. Jennifer (Atkin) Shepard, Dr. Crystal Hammer, Dr. Keith Hazleton, Dr. Anahita Falahi, Dr. Crystal Ives, Dr. Drew Calhoun, Dr. Gautam Mankaney, and Dr. Jessica Page. Nancy and Anahita are doing their residencies at the same NY hospital. What are the chances of that? Ph.D.s include Dr. Heather Bolstad, Dr. David Stanley, Dr. Stuart Endo-Streeter, Dr. Anne Marie Corgan, and Dr. Eddie O'Donnell. Last, but not least, one student, Dr. Keith Hazleton crossed both domains with an MD/Ph.D.



Another alumnus, Dr. Clint Spiegel, who is an Associate Professor at Western Washington University returned to give a seminar in the department recently. We are also happy and proud to announce that Dr. Tom Sharpton will be returning to OSU as an Assistant Professor of Microbiology later this year. Another returnee is Adriane Irwin who is coming back to OSU working in Pharmacy. Students recently accepted into medical school from BB include Joshua Raines, Ryan Derrah, and Paul Jones.

Last year, we went to Carly (Dougher) Ingle's wedding at her parents' house where we ran into Meher Vasdev and LesleAnn Hayward. LesleAnn is working in Salem and has just applied to medical school. Carly completed her M.S. degree and is scratching the med school itch this year also, with an application in the pipes. Another wedding we attended was that of Anna Vigeland Pickering, who met her husband when she did study abroad in England. Rounding out the weddings, we were delighted to attend Eric Brooks' wedding to Tawny Lamech, a fellow grad student at UT Austin. Dr. Jeremy Gregory is a Neurology Resident at Mayo Clinic and is getting married on August 30 and we are very happy for him. Ricky Catlin has rejoiced at finishing his first year of medical school.

We've had visits recently from Tari Tan (Ph.D. program at Harvard) and Amira Barkal (working at Harvard). Shawn Johnson also is there at Harvard and keeps us aware of job openings when they arise. He stopped by for lunch about a month ago. Tony Rianprakaisang (Boston U. medical school) stopped by recently just before he took off for a road trip to Yellowstone and Glacier National Parks. Zebulon Jones is a Process Equipment and Responsible Systems Engineer III at Genzyme and surprised us recently with a visit. Speaking of the Boston crowd, Han-

nah Raines and Paul Jones are both there and are engaged to be married soon. Last year we had a delightful dinner with Dr. Jill Mooney who is with Johnson and Johnson in San Diego. Since our last newsletter, we've also had a pleasant visit from Dr. Kevan Stanton. On the Kevin/Kevan front, Kevin Dunn stopped by earlier this year to keep us up to date on his work with Teach for America in the Bay area. He will be starting his second year this fall. Jessica Thorpe is in Portland now pursuing a career in education and dropped by for lunch last fall. Dr. Keith Hazleton recently finished his MD/Ph.D., has a daughter and he and wife Joy (another MD/Ph.D.) with their daughter are making the transition of going from Einstein to Denver. He drops by whenever he is in town and we always look forward to visits with him.

Kyle Ireton worked in Uruguay for the past several months and has just returned to the U.S. Dr. Jessica Page has an upcoming residency in Salt Lake City that she is very excited about. We were happy that Sydney Radding decided this year not to run the Boston Marathon, though we still envy her ability to make running look so effortless. Katie Lebold is pursuing an MD/Ph.D. at OHSU. Nima Motamedi and Laura Miller officially tied the knot in Florida and we are very happy for them. Alex Haddock has recently completed a Peace Corps stint in Ghana and is back in the U.S. planning his next move to law school. Chelsea Parker is working on her Ph.D. at Washington U, Mark Hall is at New York Medical College, and Daniel Zollinger is pursuing a Ph.D. at Baylor. Jessica Kristof left biotechnology in San Diego for biotechnology in Oregon and has settled in Portland. Kinsley Hubel is in medical school in Ireland. Sarah Jean Lindsley had one child and has another on the way. Thanks to Facebook, we've even seen its sonogram. Gina Capri also has two beautiful children and works now in speech. Scott Hollingsworth is pursuing his Ph.D. at UC Irvine and Duy Pham is doing the same at UIUC. His younger brother, Tuan, will be a senior next year in BB.

The BB Club continues to grow. This past year's President, Minhazur Sarker, wasn't even a BB major, if that says anything about how broad the appeal of the group currently is. There are now almost 200 students majoring in BB.

Current undergraduates continue their winning ways when it comes to awards. Maria Nguyen was recognized recently with the Undergraduate Woman of the Year award from the Women's Center. She also served as Mortar Board President this year, a role that will be filled next year by another BB major, Deepthika Ennamuri. Justin Biel won last year's top speaker award for his HHMI talk and then most recently was recognized with "Best Undergraduate Talk," at the West Coast Protein Crystallography Workshop XXI 2013 in Monterey, CA. Notably, he was the only undergraduate at the meeting, so they took one graduate speaking award and gave it to Justin because his talk was so strong. In addition, Justin was named OSU's top undergraduate researcher and is the first person ever to receive the award. If that wasn't enough, Justin and Ana Brar tied for the best poster in the Celebrating Undergraduate Excellent poster fair held on campus in May. Speaking of Ana, she was recognized last year with the national McKnight Award, given to outstanding undergraduate researchers in biological chemistry. Ana also won the Waldo-Cumming senior award, giving her a perfect 4 for 4 in that department



Annika Swanson



Justin Zhang



Helen Hobbs



James Rekow

Since our last newsletter, we've had three BB students win Goldwater scholarships and one win an honorable mention. They are Annika Swanson (2012), Helen Hobbs (2013), Justin Zhang (2013) and James Rekow (Honorable mention, 2013). You'll note that three of these students were recognized in 2013. OSU as a university is only allowed to forward four names to the national office for consideration. A fourth student from OSU, Tommy Pitts, also won a Goldwater in 2013, making it OSU's most successful year ever. Notably, Tommy was a BB major when he started at OSU. Our most recent Goldwater recipients preceding these folks are Caitlin Crimp and Beth Dunfield, who are preparing applications for MD/Ph.D. and DVM/Ph.D., respectively.

Indira and I are doing great - very busy, as always, but we're very happy and proud to be at OSU. Indira was named one of two Eminent Professors of the Honors College earlier this year - a very well deserved award, IMHO. As for me, I've accepted a half-time position as OSU's Director for Undergraduate Research, so I am spending less time in BB, but still doing something I love - working to get students involved in research. We hope when you are anywhere near Corvallis in the future that you will come by and say hi. We love to see old friends and to also stay in touch. Even if you don't make it to Corvallis, we appreciate hearing from you and staying in touch. We're both on Facebook, so if we aren't already your friend, please friend us.

Karplus Lab

In December 2010, I finished my term as department chair, passed on the reins to Gary Merrill, and took a short sabbatical to spend more time in the lab and getting back-logged projects written up. I'm enjoying having more time for teaching and research and also officially joining Kevin and Indira as an advisor for the growing numbers of our terrific undergraduate majors. At this point in the summer of 2013, the lab

now consists of post-doctoral research associates Dale Tronrud and Mike Gretes, grad students Camden Driggers (5th year), Arden Perkins (2nd year), and Kelsey Kean (finishing her first year and new to the lab), and undergrad Steven Hartman continuing, and Justin Biel and Callia Palioca having just graduated and defended their honors theses. Justin is heading to UCSF for grad school in Biophysics and Callia is applying to medical school and has a job in medical records for her gap year. Some award highlights of the year are the renewal of our NIH grant to study the details of protein geometry, and the winning by Mike Gretes of postdoctoral fellowships from both the American Heart Association and from NIH so that he can combine structural work in my lab with parasitology work with Buddy Ulman at OHSU toward developing new drugs to fight trypanosomal parasites. Also, Justin Biel won the 2012 HHMI best talk award for his research on protein structure, and I felt very honored to receive the 2012 College of Science FA Gilfillan Award for Distinguished Scholarship in Science. Finally, some from the group attended the Northwest crystallography workshop in Montana in July, and they made such a great presentations that we were "awarded" the honor of hosting the 2014 meeting in Corvallis.

Publication highlights of 2012 were six papers including two about protein structure fundamentals that had long gestation periods. One, culminating Donnie Berkholz's thesis work and published in *PNAS*, showed that peptide bonds in proteins deviate from planarity much more than appreciated; the other, reporting work led by former undergrad Scott Hollingsworth, described an informative new way to think about local protein conformation. Also appearing was a review by post-doc Mike Gretes describing what is known about peroxiredoxins in parasites, and a paper by second-year grad student Arden Perkins on conformational changes in the PrxQ group of peroxiredoxins. The latter paper was featured on the cover of *Biochemistry*! Rounding out the list are two papers I published with collaborators. The first was a technical comment in *Developmental Cell* giving a new understanding of how phosphorylation impacts the conformation of the tumor suppressor protein merlin. The second, a fruit of my short 2011 sabbatical stay with Kay Diederichs in Germany, was a report in *Science* showing the folly of a long-standing practice of protein crystallographers that causes them to discard useful data, and proposing a new statistic that is better suited for assessing data quality.



The Karplus lab at Bomb's Away celebrating Callia and Justin's graduation. From left to right: Callia, Arden, Dale, Andy, Justin, and Camden

Beckman Lab

Tim Rhoads completed his Ph.D. in 2012 and is in his first year as a post-doc at Madison, Wisconsin in Josh Kuhn's lab learning the many subtleties of mass spectrometry.

Kristine Robinson (Ph.D., 2006) is now Kristine Rozelle after marrying a pathologist during her post-doc at OHSU. She has a healthy new son named Luke and the family is about to move to Walter Reed Army Medical Center for a year.

Blaine Roberts (Ph.D., 2006) is a staff scientist at the University of Melbourne. He and his wife Anne came back to Corvallis in December to complete experiments using the mass spectrometry core lab.

Dan Zollinger (BA 2011) is in his second year of a Ph.D. program working on how myelin is produced. Joe ran into Dan at the International Neurochemistry meeting where Dan presented a considerable amount of work at his poster in between touring Mayan temples and swimming in the jungle.

Pam Bielby recently started in Joe Beckman's lab, where she has a strong interest in Parkinson's disease and aging. Grace Judd is working hard in the lab, cutting sections and performing immunohistochemistry to help our work on ALS. Nick West is in the lab working on expressing metallothioneins.

Nathan Lopez is still working hard in the lab, trying to keep all the balls in the air while helping everyone and fixing everything.

Gombart Lab 2013

Current Members

Mary Fantacone, lab manager

Malcolm Lowry, assistant professor

Chunxiao Guo, BB graduate student

Yan Campbell, BB graduate student

Jun Tu Zhen, Biology undergraduate, HHMI Summer 2012, working on Honors Thesis

Jun was included as coauthor on poster for the Linus Pauling Institute's Diet and Optimum Health Conference May 15-18, 2013. Regulation of human cathelicidin antimicrobial peptide gene by xenobiotic nuclear receptors and their dietary ligands. Yan Campbell, Liping Yang, Jun Tu Zhen, Jan F. Stevens, Roderick H. Dashwood, Claudia S. Maier, Adrian F. Gombart

Recent departees

Jenny Tran, BB undergraduate, graduating, received URISC and HHMI for Summer 2012; will be coauthor on manuscript for her work.

Jenny was also included as a coauthor on poster for the Linus Pauling Institute's Diet and Optimum Health Conference May 15-18, 2013.

Activation of TLR3 and TLR4 signaling suppresses vitamin D-induced cathelicidin expression in human macrophages through the TRIF-IRF3 pathway. Chunxiao Guo, Malcolm Lowry, Jenny Tran, and Adrian F. Gombart, Linus Pauling Institute,

Department of Biochemistry & Biophysics, Oregon State University, Corvallis, OR, USA 97331

Recent news

Yan Campbell defended her PhD thesis on May 23, 2013. Chunxiao Guo will defend PhD thesis in Summer 2013.

Grants

Received funding from US-ANA Health Science, Inc. for grant to study "Regulation of Human Cathelicidin Antimicrobial Peptide Gene Expression by Novel Diet-Derived Ligands of Farnesoid X Receptor"

Publications in past year

1: Dixon BM, Barker T, McKinnon T, Cuomo J, Frei B, Borregaard N, Gombart AF.

Positive correlation between circulating cathelicidin antimicrobial peptide (hCAP18/LL-37) and 25-hydroxyvitamin D levels in healthy adults. *BMC Res Notes*. 2012 Oct 24;5:575. PMC3532295.

2: Kyme P, Thoennissen NH, Tseng CW, Thoennissen GB, Wolf AJ, Shimada K, Krug UO, Lee K, Müller-Tidow C, Berdel WE, Hardy WD, Gombart AF, Koeffler HP, Liu GY.

C/EBP ϵ mediates nicotinamide-enhanced clearance of *Staphylococcus aureus* in mice.

J Clin Invest. 2012 Sep 4;122(9):3316-29. PMID:

PMC3428083.

3: Guo C, Rosoha E, Lowry MB, Borregaard N, Gombart AF.

Curcumin induces human cathelicidin antimicrobial peptide gene expression through a vitamin D receptor-independent pathway. *J Nutr Biochem*. 2013 May;24(5):754-9. PMID: PMC3485441.

4: Campbell Y, Fantacone ML, Gombart AF. Regulation of antimicrobial peptide gene expression by nutrients and by-products of microbial metabolism. *Eur J Nutr*. 2012

Dec;51(8):899-907. PMC3587725.

5: Sun G, Li H, Wu X, Covarrubias M, Scherer L, Meinking K, Luk B, Chomchan P,

Alluin J, Gombart AF, Rossi JJ. Interplay between HIV-1 infection and host microRNAs. *Nucleic Acids Res*. 2012 Mar;40(5):2181-96. PMID: PMC3300021.

Books edited

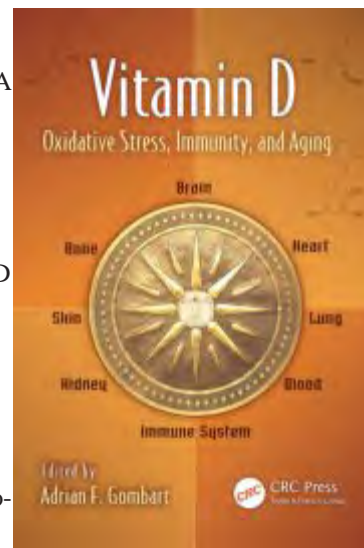
Vitamin D: Oxidative Stress, Immunity, and Aging

Series: Oxidative Stress and Disease

Published: November 21, 2012 by CRC Press - 462 Pages

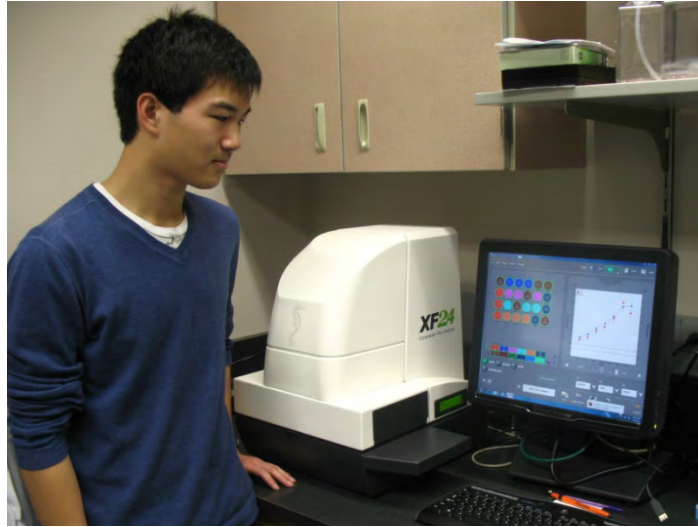
Editor(s): Adrian F. Gombart, Oregon State University, Corvallis, USA

2012



Greenwood Lab

The highlight of the year was Justin Zhang being awarded the Barry M. Goldwater Scholarship. Justin has been working on a National Science Foundation funded project examining the structure activity relationships of zinc oxide nanoparticles with anti-cancer properties. Cell culture assays suggest that the nanoparticles are toxic to glioblastoma cells, however, the mechanism is unknown. After Justin returned from his summer research program at Memorial Sloan-Kettering Cancer Center, he has used the knowledge and skills he learned during the summer to independently develop his project to determine the cell death pathways activated by the nanoparticles in glioblastoma cells.



Justin Zhang analyzing data on the Seahorse Biosciences Extracellular Flux Analyzer. One of the instruments Justin operates examines cellular bioenergetics in monolayers of cultured cells. Justin has even trained two graduate students to use the instrument.

Check out a recent paper describing a zebrafish model of the brain cancer glioblastoma:

Lal, S., La Du, Jane, Tanguay, R.L., and Greenwood, J. A. (2012) Calpain 2 is required for the invasion of glioblastoma cells in the zebrafish brain microenvironment. *J. Neurosci. Res.*, 90, 769-81. PMID: 22183788

<http://onlinelibrary.wiley.com/doi/10.1002/jnr.22794/abstract;jsessionid=6EEDC9DB97BA505DE447B987151E9A41.d02t01>

Hagen Laboratory

Jeff Monette--was awarded a slot on a T32 training grant and is doing post-doc research at the Univ of Washington in Seattle.

Swapna Shenvi (yes, I realize that she left BB for MCB) welcomed a new baby boy into the world last year. Outside of her duties as mother of two, she is a post-doctoral scholar at Children's Hospital Oakland Research Institute.

Alex Michels: continues as a post-doc in Balz's lab; just finished writing a major review article for Annual Reviews in Nutrition.

Regis Moreau has just finished his first year as an Asst. Professor at the Univ. Nebraska, Lincoln. He tells me that he is doing well but now realizes how much work it is to lecture!

Luis Gomez: obtained his Ph.D. last December. He has already been promoted to full Professor (how does this happen?!? Grad student to full prof in a month?!?) at EAFIT University in Medellin, Colombia. He is also heading up a group of 5 professors to begin a new biosciences program at that University. At this rate, he'll be a dept chair by the end of the year!

Jung Suh, is the equivalent of an Asst. Professor at CHORI. By all accounts he is doing quite well in his research which is centered on autism.

For undergrads: Shawn Johnson is in Boston working at Harvard as a research assistant before applying to med schools

Kevin Dunn is doing a stint for "Teach for America" in Oakland, CA. He has one more year in this program and then will apply to grad schools or med schools

Helen Hobbs got in to both UT-Southwestern and MIT's summer intern programs. She decided to go to MIT.

We published six peer-reviewed papers in the past year; one book chapter (to be out this year); and one review article.

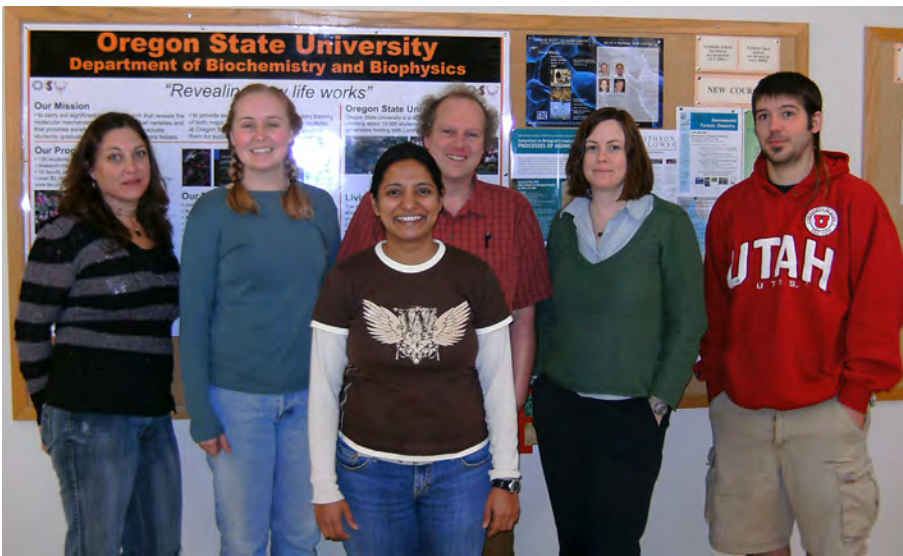
Freitag Lab Newsletter 2013

We study "epigenomics", i.e. genome-wide regulatory states that are heritable without changes in the underlying DNA sequence. Currently we run two funded projects: "Assembly and Maintenance of Centromeres in Filamentous Fungi" (NIH R01) and "Functional Analysis and Systems Biology of Filamentous Fungi" (NIH P01, PD Jay Dunlap, Dartmouth Medical School). Two non-renewable grants expired earlier this year, "Assembly and Maintenance of Centromeres" (American Cancer Society) and "Epigenomics of Development in Populus" (DOE-USDA), a collaboration with Steve Strauss and Todd Mockler, both at OSU).

The core of the Freitag Lab. Lanelle Connolly, Erin Bredeweg, Pallavi Phatale (PhD, graduated 2012), Michael Freitag, Kristina Smith and Kyle Pomraning (PhD, graduated 2012). Not pictured here is Jon Galazka.

This year two of the founding members of the lab graduated. Both Pallavi Phatale and Kyle Pomraning defended their thesis work in December 2012. Kyle works now for the Environmental Molecular Sciences Lab (EMSL) at the Pacific Northwest National Lab (PNNL) in Richland, WA, where he won a prestigious post-doctoral fellowship (see: http://www.emsl.pnl.gov/news/awards/post_doc.jsp). Pallavi moved to the Joint BioEnergy Institute (JBEI) a DOE Chemical Biology center in the bay area.

Faculty Research Assistant Lanelle Connolly and post-docs Kristina Smith and Jonathan Galazka still work towards a better understanding of centromeres in filamentous fungi in *Fusarium*



graminearum and *Neurospora crassa*. Kristina moved to Bend a while ago but continues work on all projects as a telecommuter, being responsible for all the computational aspects of our work. She is also a part-time instructor in the Biology department at OSU-Cascades.

Lanelle won the award for the Outstanding Faculty Research Assistant in the College of Science this year. Pallavi won yet another poster award for a total of four during her graduate career at OSU, this one at the Gordon Conference in June 2012, and Kyle was able to attend the 2012 ECFG11 meeting in Marburg, Germany, because he won the DeLill Nasser Award from the Genetics Society of America in 2012.

Over the last year we welcomed many international trainees to the lab, all interested in learning how to apply a specific technique, chromatin immunoprecipitation followed by high-throughput sequencing (“ChIP-seq”) to their organisms. Thus we had Razi Karimi (Technical University Vienna, Austria), Kordula

2013 Wiley Postdoc Fellows Named



Li Fu



Kyle Pomraning

Becker (Ruhr-University Bochum, Germany), Shermineh Shahi (University of Amsterdam, The Netherlands), and Lena Studt (University Muenster, Germany) in the lab for stays of between two and six months. Our current visitor is Klaas Schotanus (Max-Planck Institute, Marburg), who is working on centromeres in the wheat pathogen *Zymoseptoria tritici*, an important pathogen in Europe but also in Oregon.

Michael went to Dartmouth College in April 2013 as external thesis examiner and had a return visit to the annual Texas A&M PBoFF symposium. On both occasions he gave talks on how histone modifications control the “cryptic genome” of many

Fusarium species. Absence of one specific modification results in overproduction of proteins from 1,600 genes, among them many important but unknown secondary metabolites or effectors involved in eliciting plant disease. A first paper on this new topic of study in the lab is under review and a proposal has been submitted to NIH. Stay tuned – interesting times are ahead!

Recent Publications

K. R. Pomraning, L. R. Connolly, J. P. Whalen, K. M. Smith and M. Freitag¹ (2012) Repeat-Induced Point mutation, DNA methylation and heterochromatin in *Gibberella zeae* (anamorph: *Fusarium graminearum*). In: “*Fusarium genomics and molecular and cellular biology*” D. Brown and R. Proctor (Eds.), Horizon

Scientific Press.

K. M. Smith, P. A. Phatale, E. L. Bredeweg, K. R. Pomraning and M. Freitag¹ (2012) Epigenetics of filamentous fungi, in: “EPIGENETIC REGULATION AND EPIGENOMICS”, Encyclopedia of Molecular Biology and Molecular Medicine, Wiley-Blackwell

Vidal-Dupiol J, Zoccola D, Tambutté E, Grunau C, Cosseau C, Smith KM, Freitag M³, Dheilly NM, Allemand D, Tambutté S. (2013) Genes Related to Ion-Transport and Energy Production Are Upregulated in Response to CO₂-Driven pH Decrease in Corals: New Insights from Transcriptome Analysis. *PLoS One*. 8: e58652. doi: 10.1371/journal.pone.0058652. PMID: 23544045

R. Zhu, O. Shevchenko, C. Ma, S. Maury, M. Freitag⁵, S.H. Strauss (2013) Poplars with a PtDDM1-RNAi transgene have reduced DNA methylation and show aberrant post-dormancy morphology. *Planta* Feb 28. [Epub ahead of print] PMID: 23455459

R. Karimi-Aghcheh, J. W. Bok, P. A. Phatale, K. M. Smith, S. E. Baker, A. Lichius, M. Omann, S. Zeilinger, B. Seiboth, C. Rhee, N. P. Keller, M. Freitag² and C. P. Kubicek (2013) Functional analyses of *Trichoderma reesei* LAE1 reveal conserved and contrasting roles of this regulator. *G3* (Bethesda) 3: 369-78. doi: 10.1534/g3.112.005140. PMID: 23390613

K. R. Pomraning, K. M. Smith, E. L. Bredeweg, P. A. Phatale, L. R. Connolly and M. Freitag¹ (2012) Library preparation and data analysis packages for rapid genome sequencing. *Methods Mol. Biol.* 944: 1-22. (doi: 10.1007/978-1-62703-122-6_1) PMID: 23065605.

K. M. Smith, J. M. Galazka, P. A. Phatale, L. R. Connolly, M. Freitag¹ (2012) Centromeres of filamentous fungi. *Chromosome Research*, 20: 635-656. PMID: 22752455
G. T. Slavov, S. P. DiFazio, J. Martin, W. Schackwitz, W. Muchero, E. Rodgers-Melnick, M. F. Lipphardt, C. P. Pennacchio, U. Hellsten, L. Pennacchio, L. E. Gunter, P. Ranjan, K. Vining, K. R. Pomraning, L. J. Wilhelm, M. Pellegrini, T. Mockler, M. Freitag³, A. Geraldles, Y. A. El-

Kassaby, S. D. Mansfield, Q. C. B. Cronk, C. J. Douglas, S. H. Strauss, D. Rokhsar, G. A. Tuskan (2012) Genome Resequencing Reveals Multiscale Geographic Structure and Extensive Linkage Disequilibrium in the Forest Tree *Populus trichocarpa*. *New Phytologist* 196: 713-725. (doi: 10.1111/j.1469-8137.2012.04258.x) PMID: 22861491

S. Puckett, K. A. Reese, G. M. Mitev, V. Mullen, R. C. Johnson, K. R. Pomraning, B. L. Mellbye, L. D. Tilley, P. L. Iversen, M. Freitag³, B. L. Geller (2012) Bacterial Resistance to Antisense Peptide-Phosphorodiamidate Morpholino Oligomers. *Antimicrobial Agents and Chemotherapy*. 56: 6147-53. PMID: 22985881

B. Seiboth, R. Karimi-Aghcheh, P.A. Phatale, R. Linke, D.G. Sauer, K.M. Smith, S.E. Baker, M. Freitag³ and C.P. Kubicek (2012) The putative protein methyltransferase LAE1 controls 1 cellulase gene expression in *Trichoderma reesei*. *Mol. Microbiol.* 84: 1150-1164. (doi: 10.1111/j.1365-2958.2012.08083.x) PMID: 22554051

J. Lepesant, J. Boissier, C. Cosseau, M. Freitag³, J. Portela, D. Climent, C. Perrin, A. Z. Neto, C. Grunau (2012) Sex-specific sequences of *Schistosoma mansoni*: a possible link between recombination repression, chromatin structure and repeat transcription. *Genome Biol.* 13: R14. PMID: 22377319

K. J. Vining, K. R. Pomraning, L. J. Wilhelm, H. D. Priest, M. Pellegrini, T. Mockler, M. Freitag³, S. Strauss (2012) Dynamic DNA Cytosine Methylation in the *Populus trichocarpa* Genome: Tissue-level Variation and Relationship to Gene Expression. *BMC Genomics* 13: 27 (doi:10.1186/1471-2164-13-27) PMID: 22251412.

F. H. Ishikawa, E. A. Souza, J. Shoji, L. R. Connolly, M. Freitag³, N. D. Read, M. G. Roca (2012) The heterokaryon incompatibility response is suppressed following cell fusion by conidial anastomosis tubes in the plant pathogen *Colletotrichum lindemuthianum*. *PLoS ONE* 7:e31175. PMID: 22319613.

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Chris Mathews #1

Last November Chris Mathews and Gary Merrill enjoyed a whirlwind trip to Atlanta, where they attended the 2012 Monie A. Ferst Award Symposium honoring Ken van Holde, held at Georgia Tech. The award is presented annually to an educator in science or engineering who has made “notable contributions to the motivation and encouragement of research through education.” The number of Ken’s past students and postdocs who have enjoyed distinguished careers made him a natural for this award. The day-long symposium at Georgia Tech was organized by Shing Ho (faculty 1987–2007; department chair, 2002–2007). Most of the speakers were van Holde lab alumni, including George Rose (Ph.D. 1976, Professor, Johns Hopkins U.), Sanford Leuba (Ph.D. 1993, Associate Professor, U. of Pittsburgh), Cynthia McMurray (Ph.D. 1984, Professor, U of California Berkeley), Barbara Ramsey Shaw (Postdoc mid-1970s, Professor, Duke U), Jeff Hansen (Postdoc late 1980s, Professor, Colorado State U), and Patrick Varga-Weisz (Postdoc 1992-93 after completing his Ph.D. here with David Barnes; Investigator, Babraham Research Institute, UK). Ken, of course, presented brief remarks, which were enthusiastically received.

Several other van Holde alumni attended as guests, including Jeff Corden (Ph.D. 1979, Professor, Johns Hopkins U), Philippe Georgel (Ph.D. 1993, Faculty, West Virginia U), Woojin An (Ph.D. 1999, Associate Professor, USC) and Tim Kovacic (Ph.D. 1973, independent scientist). What Chris and Gary realized was that Ken has so many distinguished alumni that we could have stretched the symposium from one day to two with no dilution of the outstanding quality of this event.



Mehl Lab

The Mehl lab starts at OSU after migrating across the country from Franklin & Marshall College in Pennsylvania! We are now up and running thanks largely to the efforts of Rick Cooley my first Post doc. Discarded from Andy's lab after his PhD, Rick ordered all the equipment – unpacked all the goods and materials I sent, and got science going. He was able to obtain the first crystal structures of our unnatural amino acid synthetases and put together our first two publications explaining how our unnatural translational machinery work. Rick does not let moss grow – he left to greener pastures in the cold north east of Cornell for his next post doc with Holger Sondermann.



The Unnatural Protein Facility is also now running thanks to new technicians Linda Benson and Talyor Willi. If you need your protein to have new chemical ability, do contact the UP Facility they will make it happen. Currently we have about ten outside projects running for academics around the world.

We have had a good set of rotating graduate students from the 2012/13 cohorts. While we are excited to pick up our first grads, a storm of great undergraduates have been holding down the fort. Freshman Karl Moser and Maximilian Dominguez put in a solid first summer and will be returning to bring their project to publication this year. Melodie Machovina joined the lab as a junior and set up all the synthetic hoods. She got new unnatural amino acids synthesized and tested for our new bioorthogonal ligation area. Melodie's hard work has paid off and now she is headed to the big skies of Montana State University to start graduate school in Biochemistry this fall.



Chris Mathews #2

My two grants terminated in 2011 and 2012. I felt fortunate at remaining funded for ten years past my formal retirement and decided not to continue competing against younger scientists who need the support much more than I. This led to the bittersweet experience of closing my laboratory—turning over the space and much of the equipment to Colin Johnson and seeing long-time technician Linda Benson move to Ryan Mehl's lab. I continue to do some teaching, a lot of manuscript reviewing, and work on a new and shorter version of our biochemistry textbook, along with coauthors Dean Appling (U of Texas) and Spencer Anthony-Cahill (Western Wash. U).

Chris also contributed the following news items.

Donald Jacobson (Ph.D. Chih Wang, 1967) recently retired from a faculty position at the Cleveland Clinic and returned to Oregon with his wife, where they are living in Cannon Beach. Don was one of the last biochemistry graduate students to receive his Ph.D. in Chemistry, shortly before the Department of Biochemistry and Biophysics officially came into existence.

Jon Lindquist (Ph.D. McFadden, 1995) sends greetings to all from Magdeburg, Germany, where he is on the faculty of Otto-von-Guericke University in the Department of Nephrology, Hypertension, Diabetes, and Endocrinology.

David Brown also wrote recently: "I was just recently promoted to the rank of Professor at Florida Gulf Coast University. I have been at FGCU for 15 years now, having started in 1998 in FGCU's 2nd year of existence. I began in the Department of Clinical Laboratory Science in the College of Health Professions and soon became chair of the department and program leader. When the university decided to close this program I moved to the College of Arts and Sciences and became affiliated with what would ultimately become the Department of Chemistry & Math; I am the 2nd Professor in our department. For the past 7 years I have worked with Cengage Publishing on their OWL homework system, writing and programming end-of-chapter questions into the system for organic chemistry. This is one of the premiere online homework systems for organic chemistry in existence and is used worldwide by over 500 colleges and universities, and by over 100,000 students since 2008."

This spring Chris enjoyed a surprise visit from Ralph Davis (Ph.D. 1992). As long-time senior members of the research group of Roger Kornberg at Stanford University, Ralph and his wife Barbara have both coauthored numerous papers with the Kornberg group on RNA polymerase structure and eukaryotic transcription.

Last, as we were finishing this up, we just learned of an interesting article about Justin Hall (Ph.D., 2010) that appeared in NatureJobs. The URL is <http://www.nature.com/naturejobs/science/articles/10.1038/nj7457-243a>. Also, Walter Piper, who got his B.S. degree in 2011 just defended his M.S. in Psychology at OSU and is headed to NYU for a Ph.D. in neurosciences.

Barbar Lab

Barbar lab highlights over the last two years:

Promotions

Dr. Afua Nyarko has been promoted to a research assistant professor in 2012. This was a particularly good year for Afua. She was selected to give the postdoctoral award oral presentation at the Biophysical Society meeting, and succeeded in developing a new project on a transcriptional coactivator protein called York1 that received a high score from NIH.

Yujuan Song was promoted this year to a senior faculty research associate. Both she and Afua have collaborated on publications of two papers (Nyarko, Song et al, 2013, J. Biol Chem; Nyarko, Song, Barbar, 2012, J. Biol Chem.)

I was promoted to a full professor in 2011 and grateful for the unanimous vote of the BB full professors, and the many supportive letters from former and current students.

Graduate students

Jie Jing and Ariam Kidane, both now third year graduate students, join Jessica Morgan, a fourth year graduate student in diversifying the graduate student population in the lab. Jing comes from Nankai University, a premier university in China, Ariam comes from University of Asmara, Eritrea, a small country in Africa bordering the Red Sea, and Jessica from the Honors College at the University of Oregon. Jing is working on two papers that we hope to submit by October, Ariam already has a paper in press in Biochemistry (Kidane, Song et al,) and Jessica has a paper in J Biol Chem (Morgan, Song, Barbar, 2011) and another one close to being submitted.

Newcomers

Antoine Gruet joined the lab this year. Antoine comes from the Architecture and Functions of Biological Macromolecules lab of the French National Center for Scientific Research, Marseille, France. Antoine adds a much-appreciated international presence and provides an opportunity for the lab to practice their French.

Undergraduate Researchers

Zachariah Duell and Meghan Vandewettering have taken BB 401 research credits in 2013 and are undergraduate researchers in the lab this summer.

Alumni News:

Justin Hall (Ph.D 2010) together with Andrea Hall (PhD 2010) are the proud parents of a daughter who is now a toddler. The three are coming to visit the lab this August and we are looking forward to seeing them. Justin continues his very successful postdoc at Pfizer publishing papers and giving talks at national meetings including the Gordon Conference this past year.

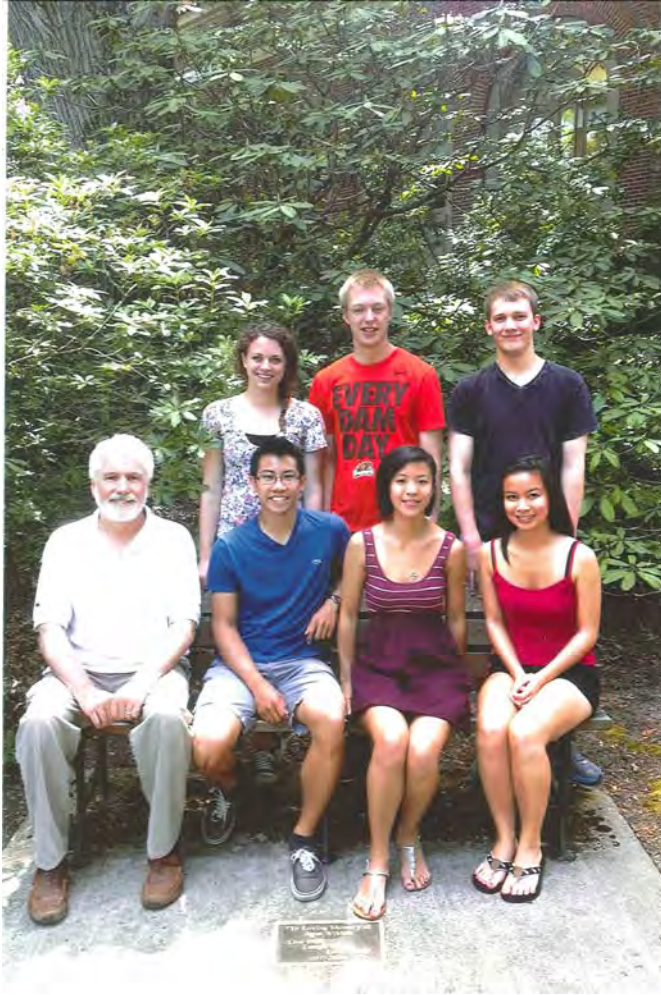
Greg Benison (postdoc 2005-2009) is also the proud father of a baby daughter who is of similar age to the Hall's daughter. After a short stint as a research associate at Reed College, Greg went back to his true passion for computational work and is now an

engineer at SCM & Automation at Rentrak in Portland.

National and International Recognition

I had an exceptionally adventurous and productive sabbatical during the 2011-2012 academic year, which helped expand the work we do on dynein to different organisms including yeast, thermophilic fungus, mammalian, and to different larger systems including the nuclear pore complex. This sabbatical also allowed continued access to high end instrumentation for small angle x-ray scattering, x-ray crystallography and > 900 MHz NMR. In 2011-2012 academic year I was invited to give over 20 talks at meetings, symposia, departments, and institutes in England, France, Spain, Germany, Czech Republic and Lebanon. In 2012-2013 academic year, I gave talks at the Annual Gibbs Conference on Biological Thermodynamics in Carbondale, IL, the Annual Biophysical Society meeting in Philadelphia, and the Annual Bio NMR meeting in Budapest, Hungary. I have pending invitation to a Dynein focused meeting in Japan and to an intrinsically disordered protein meeting in Dublin, Ireland.

Even in tight funding times, we continue to evolve by adding new techniques and new systems and remain excited about the research we do and optimistic that it is recognized, significant and making an impact.



*Chair, Gary Merrill and his undergraduate researchers:
Back row, left to right: Lauren Svenson, Blake Erikson, Josh Baumgart
Front row: Gary Merrill, Jason Mah, Thi Nguyen, Van Vu*