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TRAINEE/TRAINER  
AWARDS,

NIH Protein Biotechnology  
Training Program News &  
Reviews

2013 - 2014

# News & Reviews

WASHINGTON STATE UNIVERSITY NIH  
BIOTECHNOLOGY TRAINING PROGRAM

## Message from the Director

As we come to the end of the 2013/2014 academic year, we complete the 25<sup>th</sup> year of continuous funding of the NIH Biotechnology Training Grant Program here at WSU. Most of you know that a grant renewal was submitted to NIH in January 2013, our program was site-visited by a panel of grant reviewers at the end of May 2013, and in April 2014 I received a call from our NIH Program Officer that the grant will be funded for another 5 years. I cannot tell all those involved how much I appreciate your active involvement in the program and your continued efforts to make it a fantastic program. Thank you!

One of the highpoints of the year is the Annual Biotechnology Symposium, held each April and draws students, faculty, and staff attendance from across campus. Each year the students in the Biotechnology Training Program work hard throughout the year to plan, organize, and host this event. Four speakers were invited this year to present at this all day event, which concluded with a graduate student poster session. This year's symposium, "Northwest Biotechnology", highlighted science from biotechnology companies in the Pacific Northwest region with speakers from Phytelligence (Pullman, WA) - **Dr. Tyson Koepke**; Matrix Genetics (Seattle, WA) - **Dr. Damian Carrieri**; SIGA Biotechnology (Corvallis, OR) - **Dr. Dennis Hruby**; and NemaMetrix (Eugene, OR) - **Dr. Janis Weeks**. Some of the 'lessons' I heard were 'talk to your customers' they know what they want, specialized approaches and products can be worthwhile

(biofuels/vaccines for biowarfare agents) and perhaps most compelling to me personally, is that sometimes wonderful opportunities arise where you least expect them. So...keep your eyes and mind open!

The poster session was amazing! We have such talented, productive students and faculty associated with the Biotechnology Training Program. Thank you to all the poster judges and to all the students who shared their hard work with the viewers. Congratulations to **Shao Lu**, **Stacy Hathcox** and **Nathan Havko** on their first, second and third placements, respectively, in the poster competition. Also, honorable mentions go to **Aby Green** and **Darin Weed**. The scoring was very close and all the students should be very proud of their accomplishments.

A GIANT thank you goes to all the Officers (**Tim Harrington**, **Jackie Stone**, **Kelcey Dinkel**) of the Biotechnology Program and the numerous Symposium Committees who worked so diligently to put on such a wonderfully successful event! A HUGE thank you to the other committees who work hard to engage and inform the trainees and trainers through your various important activities on behalf of the Biotech Program.

This past year a number of trainees successfully defended their dissertations and graduated from WSU with a Ph.D. including: **Kylie Allen** (SMB), **Susan Wang**, PI), **Tyson Eucker** (SMB), **Mike Konkel**, PI), **Seth Nydam** (VMP), **Doug**

**Call**, PI), **Daniel Rieck** (CHEBE, **Wenji Dong**, PI), **Yesenia Rodriguez** (PT, **Mick Smerdon**, PI), **James Rosser** (SMB, **Wenfeng An**, PI), and **Scott Shaefner** (MPS, **Amit Dhingra**, PI). Several graduated with a MS degree including: **Isaura Gallegos** (SMB, **John Wylick**, PI), **Jennifer Santos** (VMP, **Viveka Vadyvaloo**, PI), and **Veronica Windell** (SMB, **John Nilson**, PI). Congratulations to each of you and best wishes in your future endeavors.

Four students are performing internships this summer – **Aby Green** (SMB), **Simon Newkirk** (SMB), **Gracen Smith** (MPS), and **Darin Weed** (VMP). Since the last News and Views, **David Favero** (MPS) and **Cory Gall** (VMP) performed their internships. It was great to hear about their internship experiences at a couple of the Forum meetings. We all look forward to hearing about the internship adventures from this summer during the next year.

A number of students received awards this past year: **Kim Hixson** received the Wittycombe-Charalambous Symposium Graduate Student Best Paper Award from the American Chemical Society; **Mandi Hopkins** won a 2nd place poster award in the Cell and Molecular Biology Division at the AAAS Pacific Division Meeting in Las Vegas last summer. She was also an invited speaker at the Southeastern Regional Lipid Conference Annual Meeting last November in Cashiers, NC, as well as a travel award recipient for that conference. Plus Mandi was the recipient of a 2014 ASPET Annual



Program Director Dr.  
Margaret Black

## Message from the Director

**Simon Newkirk** received a 2014 Graduate Student Travel and Registration Grant from the Graduate & Professional Student Association and a Dr. Gibbins Graduate Student Travel Award.

In faculty trainer news, **Dr. Devendra Shah** (IID) was granted tenure and promoted to Associate Professor. **Dr. Kelly Brayton** (IID) was promoted to full Professor. **Dr. Ray Reeves** received the Distinguished Faculty Award. I (**Dr. Margaret Black**) was pleased and honored to receive The Association for Faculty Women's Samuel Smith Leadership Award. **Dr. Norm Lewis** was selected as a Fellow of the American Society of Plant Biologist and received a Fullbright Award (Science Without Borders). **Drs. Wenefeng An** and **Amit Dhingra** were individually recognized by the WSU Honors College as Outstanding Thesis Advisors. Regents Professor **Dr. Mick Smerdon** was elected to the Washington State Academy of Sciences and was promoted to Biotech Program Emeritus Faculty status. We thank him for his years of service and dedication to the Biotech Program. We fully anticipate that he will continue to participate in the Program's activities for many years to come.

With the renewal of the Training Grant, there are some changes in the Executive Steering Committee that I'd like to tell you about. **Dr. Cliff Berkman** (Chemistry) is the new Associate Director of the Biotechnology Training Program and replaces **Dr. Neil Ivory** (CHEBE) who served in that capacity for many, many years. We thank

Neil for his years of dedication and commitment. New to the Executive Steering Committee is **Dr. Nehal Abu-Lail** (CHEBE), who will begin her tenure in July. Welcome! Other continuing members include **Dr. John Browse** (MPS), **Dr. Doug Call** (IID), and **Dr. Ray Reeves** (ex-officio, SMB). In closing, I would like to acknowledge **Ms. Susan Bentjen** for everything she does for this program. I cannot thank her enough for all her efforts on the training grant renewal submission. Please, if you get a chance, stop by or email Susan to tell her how much we all appreciate everything she does. Have a wonderful summer!



# Symposium Speaker Profiles

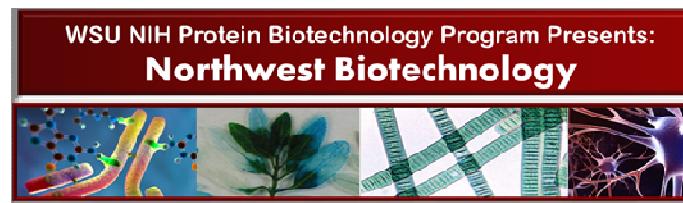


## Dr. Tyson Koepke Phytelligence

A WSU graduate and member of the NIH Protein Biotechnology Training Program, Tyson Koepke, Ph.D., is a co-founder and the Director of Operations at Phytelligence. Growing up on his family farm, Tyson became interested in plant biology and the applications of science to improve agriculture. He pursued his passion by earning a B.S. in Plant Biotechnology from Montana State University in 2006 and a Ph.D. in Molecular Plant Sciences from WSU in 2012. During his Ph.D., he developed protocols for tissue culture of sweet cherry varieties. He also examined gene expression of important agronomic traits including flower number and fruit-pedicel abscission. With his graduate mentor Dr. Amit Dhingra and several lab members, Tyson co-founded Phytelligence in 2011. In January 2013, Phytelligence began operations out of the WSU Research Park and are currently growing apples, pear, cherries and raspberries for commercial nurseries and growers in the Pacific Northwest.

Phytelligence is an actively growing company looking

to add to its team including internships in biology and business positions. As Director of Operations, Tyson oversees day-to-day operations including production and delivery, customer orders, proposals and development activities. Tyson also runs the genetic analysis platform of Phytelligence.



## BIOTECHNOLOGY SYMPOSIUM 2014

The WSU NIH Biotechnology program held our 23<sup>rd</sup> Annual Biotechnology Symposium on April 25th 2014. Thank you to all who added to its success this year!

## Dr. Damian Carrieri Matrix Genetics

Damian Carrieri has been researching photosynthesis and metabolism in cyanobacteria for nearly a decade to better understand how these organisms can be used for renewable production of fuels and chemicals. Damian works on a team of scientists at Matrix Genetics, LLC dedicated to improving photosynthetic product yields from cyanobacteria through genetic engineering strategies. Before joining Matrix Genetics in 2013, Damian worked at the National Renewable Energy Laboratory in Colorado. He earned a B.A. at Washington & Jefferson College and his M.A. and Ph.D. at Princeton University



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# Symposium Speaker Profiles

## Dr. Dennis E. Hruby SIGA Technologies

Dennis E. Hruby, Ph.D., has served as SIGA's Chief Scientific Officer since June 2000, and was the Vice President of Research from April 1997 through June 2000. From January 1996 through March 1997, Dr. Hruby served as a senior scientific advisor to SIGA. Dr. Hruby received his Ph.D. in Microbiology from the University of Colorado Medical Center and holds an undergraduate degree in Microbiology from Oregon State University. He conducted virology research as an NIH postdoctoral fellow at the University of Wisconsin, Madison, from 1979 through 1982, and at the State University of New York, Stony Brook, from 1977 through 1979. Dr. Hruby is currently a Courtesy Professor of Microbiology at Oregon State University, after spending 27 years on the faculty and serving in a number of capacities, including Director of the Molecular and Cellular Biology Program and Chairman of the Microbiology Department. Dr. Hruby specializes in poxviruses, virology and anti-infective research. He has published more than 210 manuscripts/chapters, 400 abstracts and currently holds approximately 200 US and international patents for methods of use, compounds, and pharmaceutical compositions. He is a member of number of societies, including the American Society of Virology, the American Society for Microbiology, and is a fellow of the American Academy of Microbiology. He has received a number of honors including Discovery Award (OHS), Sigma Xi Research Award and the OSU Distinguished Alumni Award. He is a member of a number of editorial boards and has served on numerous federal grant panels.



## Dr. Janis Weeks NemaMetrix

Janis Weeks, Ph.D., is Professor of Biology at the University of Oregon (UO) and a member of the Institute of Neuroscience and African Studies Program. She received her B.S. in Applied Biology from MIT and Ph.D. from UC San Diego. Professional recognition includes a Guggenheim Fellowship; NIH Research Career Development Award; National Science Foundation Presidential Young Investigator award; Alfred P. Sloan Research Fellowship in Neuroscience; and Faculty Teaching and Martin Luther King Jr. awards at UO. Traditionally, her research focused on hormonally-mediated plasticity in neural circuits and behavior in insects. Since 1996, Weeks has taught in IBRO (International Brain Research Organization) neuroscience training programs in Africa and she is also a student and performer of Zimbabwean music. Motivated by her connections with Africa, Weeks reoriented her research toward global health issues. She and colleagues have now developed novel electrophysiological and microfluidic technologies to accelerate the development of anthelmintic (anti-worm) drugs for human and animal health, funded in part by the Bill & Melinda Gates Foundation.



Weeks is Co-Founder and Chief Scientific Officer of NemaMetrix LLC, a UO spin-off company that commercializes this technology. At UO, Weeks has served as Head of the Department of Biology and Director of the African Studies Program and, at the national level, has served on review panels and advisory boards at the National Institutes of Health, National Science Foundation and National Academy of Sciences.

► INTERNSHIP REPORTS AND  
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# Internship Reports



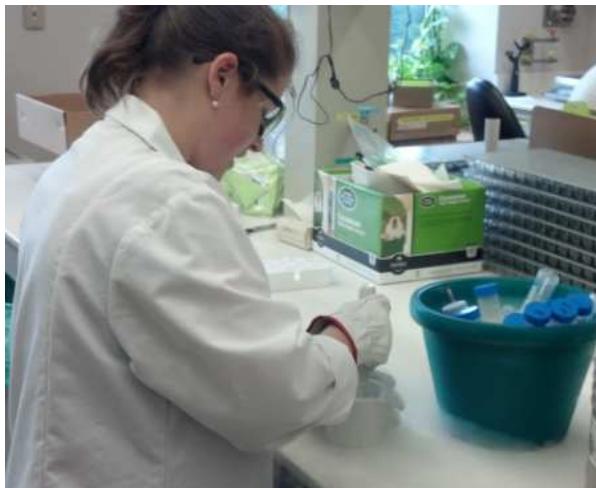
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## Jackie Stone

Amgen (Seattle, WA)

I interned at Amgen in Seattle, WA in the Discovery Toxicology Department. This is the group responsible for investigating why drugs in clinical trials have showed signs of toxicity, and how to fix these problems. My main job while there was developing protocols for using multi-photon microscopy to image the effects of a drug on certain tissues. Multi-photon microscopy is a technique that allows imaging at much greater depths than confocal microscopy, allowing imaging of entire tissues. The goal is to eventually be able to image a treated compared to an untreated organ to compare differences and measure the effect to that organ of the drug treatment. I was working this summer with rat organs that often show complications from drugs, particularly eyes, liver, and kidney. My task was to determine the best protocols for preparing the tissue for optimal multi-photon imaging. This involved developing tissue clearing protocols to clear different refractive indexes from the tissue, as well as testing various antibody labeling methods to stain particular markers in the organs. In addition to optimizing the tissue preparation I worked with the multi-photon microscope itself, taking many three dimensional images of the tissue I had prepared. My research at Amgen helped set the stage for imaging drug effects on multiple tissues in future studies.



## Kimberly Cotton

DuPont Pioneer (Wilmington, DE)

In the summer of 2013, I completed my internship at DuPont Pioneer. DuPont aims to provide sustainable and innovative science-based solutions to some of the world's biggest challenges. DuPont acquired Pioneer Hi-Bred in 1999, extending its research in seed improvement, crop protection, and overall agronomical productivity.

I was working in the output traits group, where we try to optimize the traits of the crop to benefit the farmer and the consumer. We were working on soy bean to increase oil and protein, decrease non-digestible sugars, and make these changes while maintaining the positive agronomic traits of the plant. To do this, we were testing the effects of different promoter and gene combinations in transgenic lines. I was focused on the DGAT gene, which is the final step in oil synthesis. By overexpressing a very active form of this gene, oil is increased in these lines; and in conjunction with other genes in the construct, that carbon was diverted from undigestible sugars. First, I characterized the mRNA expression of the DGAT gene in the OIL114 transgenic line, and using RTPCR we confirmed that DGAT is indeed expressed in the bean. Second, I worked to quantify the protein expression of DGAT using Western Blots, and we got preliminary data indicating that the protein is more strongly expressed in OIL114 than in WT plants. Finally, we used 5' RACE to determine the transcriptional start site of the promoter driving DGAT, and found that it used the start site predicted by the Pioneer team, not the start site published on the Soybean genome website.

This internship was a fantastic complement to my studies here at WSU. I was able to contribute my understanding of oil synthesis to the team, while learning about high-throughput sample analysis,

To learn more about Amgen, visit [www.amgen.com](http://www.amgen.com)

To learn more about DuPont Pioneer, visit [www.pioneer.com](http://www.pioneer.com)



# Internship Reports



## Cory Gall

Centers for Disease Control and Prevention  
(Atlanta, GA)

My fellowship focused on the entomology aspect of malaria research conducted at the CDC. The fellowship research concentrated on three areas:

Become efficient in rearing mosquitoes and responsible for a *Anopheles gambiae* Kisumu colony.

Molecular identification of 2012 Angola mosquito samples using PCR specific for *An. gambiae* and *An. funestus* complexes.

Begin DNA sequencing of 2012 Angola mosquito samples for identification.

I successfully learned mosquito-rearing techniques, which allowed me to build and maintain a multi-generational colony of *An. gambiae* Kisumu. I was able to learn the mosquito lifecycle, behavior, and domestication preferences of this species with extensive hands-on time. Also, I was able to process all of the Angola field-collected mosquitoes that were backlogged. For this, I learned single-mosquito DNA extraction and species identification using molecular techniques. I conducted PCR testing for *An. gambiae* and *An. funestus* complexes, resulting in 3 positive PCR samples out of 114 total samples – 1 *An. gambiae* and 2 *An. quadriannulatus*. Lastly, I started sequencing the 2012 Angola mosquito samples that didn't amplify with PCR. I was able to clone and sequence 3 samples before my fellowship ended. These samples produced BLAST results of *An. minimus*, which is an Asian mosquito; however, there is an African mosquito in the same complex as *An. minimus*.

Overall I had a very positive experience as a CDC fellow. I enjoyed working with everyone, I had an amazing supervisor, and my experience within the CDC's insectary was excellent. The only negative thing about my fellowship is that the length of the fellowship was so short.

## Desiree Mendez

ARTERIS Technologies (Missoula, MT)

I worked with Dr. Chuck Thompson on chemistry of nanomaterials. I liked the people I worked with and the company facilities. I didn't enjoy the weekly write-up reports that were required as they often consumed more than 8 h of work on the weekends to complete. I learned that starting and maintaining a biotechnology company is difficult. Part of this difficulty arises in funding the company which must be secured through small business grants or contributions from family and friends. Overall, I enjoyed this internship and learned many new techniques which I have added to my toolbox to enhance my skills as a scientist. I would consider a job following graduation in the biotechnology industry as an alternative career path to my current plans of working for the government because of the internship.



To learn more about ATERIS Technologies, visit  
[www.ateristech.com](http://www.ateristech.com)

# Internship Reports

**David Favero**  
Phytelligence (Pullman, WA)

I completed my internship for the NIH Protein Biotechnology program with Phytelligence. Dr. Tyson Koepke, who supervised my internship at Phytelligence, was a former student in NIH Protein Biotechnology program here at WSU. The company was started by members of the lab of Dr. Amit Dhingra, an Associate Professor in WSU's Horticulture department..I thoroughly enjoyed my time at Phytelligence and believe that I have had an experience equivalent or better to what I would have had at a large biotech company.

My favorite aspect of the internship was probably simply beginning to learn about tree fruit biology and production. As an undergraduate, I majored in soil and crop sciences, which gave me a pretty good understanding of the biology of and the production practices used with field crops. However, prior to beginning my internship at Phytelligence, I knew very little about the biology and production of tree fruit crops. Therefore, my time at Phytelligence enabled me to supplement my knowledge regarding field crop production with information regarding the production and biology of tree fruits.

Further, as I learned about some of the key differences between fruit tree crop and field crop production, I came to understand exactly how Phytelligence is relevant to the fruit tree production industry and is attempting to help solve one of the major challenges growers are currently facing. It has become clear to me that Phytelligence has the potential to revolutionize the process by which fruit trees are propagated for growers all around the world. The traditional propagation process presents, for fruit tree growers ordering trees to place in their orchards, three significant problems. The propagation process being employed by Phytelligence should greatly alleviate these problems growers ordering trees currently face. Before beginning my internship, despite having heard previously about Phytelligence, I did not understand how the company was relevant to the fruit tree production industry, because I lacked knowledge regarding the propagation process and how the traditional method causes severe difficulties for the industry.

Besides getting to observe first hand a great example of how a biotechnology company is starting in an attempt to address a major challenge inhibiting the increase of food production through tree fruit crops, I was exposed to other aspects of the business of a biotechnology company. This is something I very likely would not have been exposed to had I done my internship with a biotechnology company that was already well established. I have no background in business and came into this internship knowing next to nothing about what it would



take to start and run a biotechnology company. Now, I feel like I have at least a general understanding of many different parts of the process, from finding investors willing to finance the company during its startup phase to planning the construction of new facilities.

I was able to help with a few research and development projects, which I definitely enjoyed. I spent a lot of time working on the issue of rooting both cherry and apple plants previously growing in tissue culture. I found out that it is not trivial getting plants growing in tissue culture to produce roots. Hence, I spent a lot of time researching various different protocols and trying out a few of them in an attempt to improve rooting of some of the cherry and apple varieties Phytelligence is working with. Another project I did was to test if cutting apple plantlets into nodal segments would increase propagation rates. When comparing this method side-by-side with the other method they had been using, it was apparent that the nodal method was less effective for propagation than the old method. The nodal method took longer than the old method and also resulted in lower propagation rates.

This was overall a very positive internship experience for me, and therefore, there were very few things I disliked about my time at Phytelligence. One thing I was a bit disappointed about was doing very little work on the genetic analysis side of things. I learned almost nothing about how Phytelligence does their genetic analysis, so it would have been interesting to learn more about that. Unfortunately, it simply happened while I was there that genetic analysis was not at all the focus, and there usually were simply more pressing issues related to production which we all were forced to focus on. Also, I was given some time to read up on fruit biology, and although this time was quite useful to help me better understand the work I was doing as an intern, the time allotted for this was somewhat in excess.

In summary, this internship was a positive experience for me and I am excited that I had a chance to play a small part in moving this company forward as it is in its startup phase. I am thankful for the chance that Tyson and the others at Phytelligence gave me to be a part of the team for a couple months and fulfill my internship requirement for the NIH Protein Biotechnology program. I hope that my time at Phytelligence will pave the way for more students in this program at WSU to fulfill their internship requirements while having an enjoyable and beneficial experience that will further help move this young company forward.

To learn more about Phytelligence, visit [phytelligence.com/](http://phytelligence.com/)



# Internship Reports

## Stacy Hathcox

Seattle Genetics (Bothell, WA)

During the summer of 2013, I completed my internship requirement at Seattle Genetics, a medium sized biotechnology company located in Bothell, WA. Seattle Genetics develops antibody-drug conjugates (ADCs) that specifically target biomarkers uniquely expressed or overexpressed on cancer cells. ADCs are formed by attaching a cytotoxic drug-linker to a monoclonal antibody raised against a specific tumor antigen. Targeted recognition and cytotoxicity of cancer cells is thus achieved while reducing the systemic toxicity normally associated with cancer therapies. Seattle Genetics has a very robust antibody-drug conjugate pipeline, with a variety of antibody-drug conjugates currently being investigated in preclinical, phase 1, phase 2, and phase 3 clinical trials. Furthermore, one antibody-drug conjugate (ADCETRIS) is currently approved for the treatment of relapsed or refractory Hodgkin lymphoma and anaplastic large cell lymphoma (ALCL).

While at Seattle Genetics, I had the opportunity to work in the Analytical Sciences (AS) group under the mentorship of Dr. Adam Fung. The AS group serves an integral role at Seattle Genetics, and supports many other functional groups at the company. One of the many responsibilities of this group is to characterize the critical quality attributes (CQAs) of the ADC drug product and its intermediates. Analytical methods are used to define the product quality of the ADC and antibody Intermediate, and the AS group is responsible for characterizing product quality during each phase of the manufacturing process as well as monitoring long term product quality. There are numerous CQAs analyzed by the AS group, including glycan composition, N- and C-terminal processing, deamidation, size variants, and charge variants; the latter being the focus of my internship.

One of my goals while at Seattle Genetics was to characterize the charge variants associated with a preclinical ADC and its antibody Intermediate. This ADC was being developed for the treatment of acute myeloid leukemia (AML). Charge variants of an ADC are those species that have a different overall net charge compared to the main species. For example, during monoclonal antibody production, the final product will actually

be heterogeneous since it will consist of one predominant species along with other antibodies that differ in glycan composition, fragmentation, deamidation, etc. Acidic charge variants are those that have a net negative charge, and basic charge variants are those that have a net positive charge compared to the main peak and may be separated in an electric field based on overall net charge. Analyzing charge variants is important for characterizing the product quality profile, ensuring lot-to-lot consistency and for understanding product degradation pathways.

To separate and fractionate the charge variants present in the ADC, an Agilent 3100 OFFGEL Fractionator was utilized. The purity of each fraction was analyzed using imaged capillary isoelectric focusing (iIEF), which allowed for a quantification of the relative amounts of charged species contained in each fraction. Various analyses were then completed to characterize the identity of the charge variants present in each fraction. One analysis that was performed utilized an Agilent 2100 Bioanalyzer to determine if size variants such as antibody fragments contributed to any of the charge variant populations. Furthermore, many of the fractions were analyzed using reversed-phase chromatography with online mass spectrometry detection to characterize the various modifications present on the antibody backbone that could contribute to the presence of a charge variant.

Overall, I had a great experience while working at Seattle Genetics. I was able to learn about ADC manufacturing, analytical characterization strategies and techniques, and the company dynamics of a medium sized biotechnology company.



To learn more about Seattle Genetics, visit  
[www.seattlegenetics.com](http://www.seattlegenetics.com)



# Trainee/Trainer Awards, Presentations, and Achievements

## Trainee Awards

### Emily Davenport (Chemical Engineering and Bioengineering)

was awarded 2<sup>nd</sup> place in the artistic category, and 3<sup>rd</sup> place in the scientific category for the Inland Northwest Micrograph Contest.

### David Favero (Molecular Plant Sciences)

was awarded an NSF East Asia and Pacific Summer Institutes (EAPSI) fellowship to study at the RIKEN Center for Sustainable Resource Development in Yokohama, Japan, this summer.

### Kim Hixson (Molecular Plant Sciences)

received the Withycombe-Charalambous Symposium Graduate Student Best Paper Award, American Chemical Society, earlier this year.

### Mandi Hopkins (Pharmaceutical Sciences)

won a 2nd place poster award in the Cell and Molecular Biology Division at the AAAS Pacific Division Meeting in Las Vegas last summer. Mandi was also an invited speaker and travel award recipient for the Southeastern Regional Lipid Conference Annual Meeting last November in Cashiers, NC. Also won a 2014 ASPET Annual Meeting at Experimental Biology Graduate Student Travel Award winner.

### Seth Nydam (School of Global Animal Health)

received second place for oral presentation (Medical & Life Sciences) at the 2014 Wiley Research Exposition.

### Darin Weed (Veterinary Microbiology and Pathology)

received National Science Foundation Graduate Research Fellowship Program

This grant is worth 132k over 3 years.

### Leanne Whitmore (School of Molecular Biosciences)

was awarded a NSF travel grant from the International Conference on Research in Computational Molecular Biology (RECOMB), the [Dr. Bruce Gibbin's travel award](#) from the School of Molecular Biosciences, and the Graduate and Professional Student Association (GPSA) travel grant.

## Trainer Awards

### Dr. Amit Dhingra (Molecular Plant Sciences)

received "Outstanding Thesis Advisor" from the WSU Honors College.

### Dr. Norman Lewis:

has a Fulbright (Science without Borders) award, and also was selected as a Fellow of American Society of Plant Biologists earlier this year

### Dr. Nehal Abu-Lail:

received a Fulbright Scholarship and received the following grants:

1) STAC-TEC: Sustainable Technology, Alternate Chemistry-Training and Education Center, NIHES-NIH, Sub-contract from the University of Washington. Award PI: Mike Yost and WSU co-PI's are Nehal Abu-Lail with Haluk Beyenal.

2) Production of Biohydrogen and Bioethanol from Agricultural and Municipal Solid Wastes, Jordan Scientific Support Research Fund, co-PI with Fahmi Abu-Rub, M. Najeeb, S. kewan, R. Jomaa, Z. Abu-Rub, and M. Shahadeh

## 2014 Symposium Poster Winners

### First Place:

Shao Lu

(SGAH, with Douglas Call)

### Second Place:

Stacy Hathcox

(SMB, with Margaret Black)

### Third Place:

Nathan Havko

(IBC, with John Browse)

### Honorable Mentions

Aby Green

(SMB, with Chulhee Kang)

Darin Weed

(VMP, with Anthony Nicola)



# Trainee/Trainer Awards, Presentations, and Achievements

## Trainee Publications in 2013-2014

### Dr. Kylie Allen:

**Kylie D. Allen**, Susan C. Wang. 2014. Initial characterization of Fom3 from *Streptomyces wedmorensis*: The methyltransferase in fosfomycin biosynthesis  
*Arch. Biochem. Biophys.* 543: 67-73.

### David Favero:

Zhao J, **Favero DS**, Peng H, Neff MM. 2013. *Arabidopsis thaliana* AHL family modulates hypocotyl growth redundantly by interacting with each other via the PPC/DUF296 domain. *Proc Natl Acad Sci U S A* 110: E4688-4697.

### Aby Green:

**Green, A.R.**, Nissen, M.S., Kumar, G.N.M., Knowles, R. N. and Kang, C. 2013. Characterization of *Solanum tuberosum* Multicystatin and Significance of Core Domains. *The Plant Cell*, 12: 5043-52.

### Seth Nydam:

**Nydam, S.D.**, Shah, D.H., and Call, D.R. 2014. Transcriptome analysis of *Vibrio parahaemolyticus* in type III secretion system 1 inducing conditions. *Front. Microbio.* 4:1.

### Jackie Stone:

Liu Q, **Stone JA**, Bradel-Tretheway B, Dabundo J, Benavides Montano JA, Santos-Montanez J, Biering SB, Nicola AV, Iorio RM, Lu X, Aguilar HC. 2013. Unraveling a Three-Step Spatiotemporal Mechanism of Triggering of Receptor-Induced Nipah Virus Fusion and Cell Entry. *PLoS Pathog* 9:e1003770.

