

Conference Proceedings

for the 4th Annual

“What Can You Be With a PhD?”

STEM Career Symposium

held on March 25th, 2017



Exploring routes along the career freeway

Organized by

UC San Diego Postdoctoral Association

Salk Society of Research Fellows

Sanford Burnham Prebys Science Network

Scripps Research Institute Society of Fellows

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Acknowledgements

On behalf of the Postdoctoral Associations of UC San Diego, Salk Institute for Biological Studies, Sanford Burnham Prebys Medical Discovery Institute, and Scripps Research Institute, we would like to thank all attendees, speakers, panelists, volunteers, and sponsors for supporting the 4th Annual “What Can You Be With a PhD?” STEM Career Symposium! The growing difficulties in securing funding and the increased scarcity of tenure track faculty positions have made it imperative to explore other career options. There are actually many avenues to success outside of academia, some of which many postdocs and graduate students may not be aware of. This was the impetus behind the creation of this Symposium, to enable interaction with experienced professionals to help inform and guide future career decisions.

The previous events organized by the Postdoctoral Associations in 2014, 2015, and 2016 were very successful. This year, we added two new sessions – R&D in Bioengineering and Bioinformatics, and Project Management and Business Strategy - and increased the number of panels to ten, in order to address additional career areas and reach out to more attendees and speakers. We hope that by attending the Symposium, postdocs and grad students were able to discover many new possibilities for a bright and successful future.

The organizing institutions would especially like to thank all of the speakers and panelists for generously volunteering to share their stories and wisdom. We also extend our deepest thanks to our sponsors and volunteers who helped make this year’s STEM Career Symposium such a success. We are grateful for your support in our career development efforts.

Sincerely,

The Organizing Institutions

UC San Diego Postdoctoral Association (PDA)

Salk Society of Research Fellows

Sanford Burnham Prebys Science Network

Scripps Research Institute Society of Fellows

Keynote Address

Leveraging One's Knowledge & Skills: From Professional Canvas to Career Arc

About the Speaker



Phil Sheridan, Ph.D., is an industry consultant with 20+ years of research management experience in both start-up and established biotech and biopharmaceutical research organizations, having held management and team leader positions at Halozyme Therapeutics, Centocor Inc. (a Johnson & Johnson Company), Arizeke Pharmaceuticals and Chiron Corporation Center for Gene Therapy. He has a diverse knowledge base in biologics drug discovery, molecular and cell biology, protein engineering, gene therapy, alternative biofuels, project management, team leadership, mentoring and teaching. He has also served as a coordinator and instructor for biotechnology courses and programs at San Diego City, Miramar and Southwestern community colleges, and UC San Diego (UCSD) Extension's campus. Phil co-founded Bio4Front Inc. with the mission to provide mentoring, career development, and customized educational services for professionals transiting into or across the life science industry. He received his Ph.D. from the University of Colorado Health Sciences Center, completed his postdoctoral studies at the The Salk Institute for Biological Studies, professional certificates in Biofuels & Energy Science and the Craft Brewing Program from UCSD Extension Campus, and is nearing completion of a Masters of Business Administration (MBA) with dual concentrations in New Ventures and Supply Chain Management.

Keynote Summary

Dr. Sheridan's Keynote Address laid out a general framework for how a young STEM professional can start thinking about the ways in which their technical expertise, knowledge, soft skills, and leadership capabilities can complement each other. Using a biotech job posting as an example, Dr. Sheridan laid out how one could create a job position canvas highlighting these skills and apply this to careers of interest going forward. He also touched upon the various components of the job search, including self-awareness and exploration of which career paths out there are a good fit for their individual values and interests, and building a professional network of peers and mentors. His presentation approached the topic of early STEM career exploration and development from a big picture perspective that can be generalized and applied to a wide variety of career paths, and provided attendees some core concepts to think about and refer back to as they participated in the rest of the symposium panels on various STEM career areas.

Panel 1

R&D in Life Sciences

Moderator: Min Zong, PhD

Panelists

Ron Swanson, PhD, *Senior Director, Janssen*



Ron Swanson is currently Senior Director at The Janssen Pharmaceutical Companies of Johnson & Johnson. Before joining Johnson & Johnson 10 years ago, Dr. Swanson was co-founder and CSO at ActiveSight and established ActiveSight to be a leading structural biology contract research organization. Dr. Swanson was previously Director of Molecular Biology at Syrrx and Director of Genomics and Protein Expression at Diversa. Dr. Swanson attained his BA in Biochemistry and Cell Biology from UCSD, his PhD in Molecular Biology from UC Berkeley with Alex Glazer, and his postdoctoral training in Mel Simon's lab at Caltech.

Anna Waters, PhD, *Director of R&D Operations, Organovo*



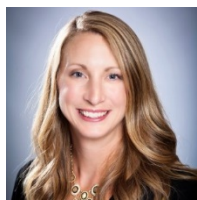
Dr. Anna Waters is currently Director of R&D Operations at Organovo, a 3D bioprinting company. Anna has held management positions in several well-known biotech companies, including Life Technologies, Beckman Coulter and Millipore and also holds an associate faculty position in the biology/biotech department at MiraCosta College. Anna's career has spanned many aspects of Biotechnology, from R&D and manufacturing to technical support, product lifecycle management and even IT. Anna received her PhD in Veterinary Microbiology from Texas A&M University in 1992 and did her postdoctoral studies at The Scripps Research Institute.

Stan Jin, PhD, *Co-founder and VP of Chemistry, FronThera US Pharmaceuticals*



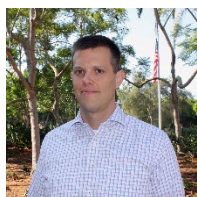
Stan co-founded FronThera US Pharmaceuticals and serves as the Vice President of Chemistry. Prior to FronThera, he co-founded C2 Pharmaceuticals, a small molecule Drug Discovery company focused on oncology and immunology, and served as the CSO and CEO. Before venturing out on his own, Stan had eight years of experience in the pharmaceutical industry as a medicinal chemist and Project Leader at Takeda San Diego and ICOS. Stan earned his PhD in Chemistry from Texas A&M University in 2002 and did a postdoc at the University of Notre Dame from 2002-2004.

Jill Wykosky, PhD, Associate Director and Head of GI Biology, Takeda California



Jill obtained her B.S. in Microbiology from the University of Pittsburgh and PhD in Molecular Medicine from Wake Forest University School of Medicine. During her PhD, she characterized a novel target for brain tumor drug development and discovered a previously unknown function for a soluble ligand in tumor cells. Jill did her post-doctoral training in the Ludwig Institute for Cancer Research (LICR) San Diego Branch, where her work there focused on therapeutic resistance to small molecule inhibitors in brain tumors. Jill is also the founder of the LICR Career Development Series at the Ludwig Institute San Diego. Jill joined in Takeda in 2013 and she is currently Associate Director and Head of GI Biology at Takeda California. She leads a group focused on target identification, validation and drug discovery in the area of gastrointestinal disorders.

Steve Kaiser, PhD, Principal Scientist, Pfizer



Steve Kaiser earned his PhD in Axel Brunger's lab at Stanford University where he solved structures revealing how the VAP family of ER membrane proteins recruit cytosolic proteins containing FFAT motifs to the ER periphery. Steve did his first postdoc in Ron Kopito's lab at Stanford where he developed quantitative mass spectrometry methods for measuring ubiquitin pools in cell or tissue lysates. Steve did his second postdoc in Brenda Schulman's lab at St. Jude Children's Research Hospital, where he solved structures of autophagy-specific E1-E2 ubiquitin-like protein transfer complexes. In 2014 Steve joined Pfizer where he is currently a principal scientist. His work applies x-ray crystallography and a range of biophysical methods toward understanding protein structure, dynamics, function and interactions to enable small molecule drug discovery and structure based drug design.

Angela Cone, PhD, Senior Scientist at Neurobiology, ICB International



Angela earned her BS in cell & molecular biology at Humboldt State University and her PhD from San Diego State University. Her PhD research examined gene regulation during development of the nervous system in marine embryos and took her to the Marine Biological Laboratories in Woods Hole each summer where she developed a passion for microscopy. Angela worked on a variety of projects during her postdoc at the National Center for Microscopy and Imaging Research (NCMIR), a microscopy core facility at UCSD. There she gained expertise in neuroinformatics, large scale imaging, antibody characterization, and fluorescent assay design while studying the structural biology of Connexin proteins and their function in the brain. Angela was the recipient of the NIH - NRSA Fellowship during her postdoctoral research from 2009-2012. She is currently Senior Scientist and head of neurobiology at ICB International, an early-phase start-up developing diagnostics and therapeutics for neurodegenerative diseases.

Panel Summary

What skills are transferable from a postdoc to an industry R&D position, and how can we best prepare for the transition? (Bio and answer)

Ron Swanson has been working in industry since 1994. He was director in Diversa and Syrrx, co-founder and CSO of ActiveSight. He joined Janssen in 2006.

Ron: Look for new opportunities as they arise, and take advantage of them!

Interact with people, even if this is outside of your comfort zone. Get out and talk in front of people, you need people to get things done for you!

Anna Waters has been working in industry since 1996. She has held management positions in several well-known biotech companies and is involved from R&D, manufacturing, tech support to product management. She joined in Organovo in 2014.

Anna: I had no idea that I would be here now. I learned a lot of good techniques and good systems during my postdoc that were helpful in the transition. Above all, I learned to have an inquisitive mind, which enabled me to obtain non-bench positions! Regarding future careers, always keep an open mind! Try to understand the business and operational sides of the industry. Ultimately, be sure to follow your heart and mind, and don't think that things are out of reach! Make the most of networking and attending events, this is key to finding the next position.

Stan Jin has been working in industry since 2004. He worked in Takeda for 5 years then founded C2 pharmaceuticals. In 2015 he founded FronThera.

Stan: The life science process is very complex. I am a scientist, businessman, accountant, paralegal, even a printer repair man! You need a willingness to do what you need to survive and thrive.

Things to consider for a successful career in R&D:

1. Strive to be an expert in your field: pharma companies are trying to attract the best talent.
2. Prioritize: keep a mindset for new opportunities: insist on working on the most valuable activities.
3. Attitude: be proactive! Strive to be known as proactive: go above and beyond.
4. See where the value is within an industry/company: train yourself to see the essence of what is going on.
5. Be able to communicate clearly, without confusing others.

Jill Wykosky joined in Takeda in 2013. She did her postdoc training in Ludwig institute of Cancer Research.

Jill:

1. Make the best of this time as a grad student or postdoc! You are the CSO and CFO of your projects! Be the subject matter expert: what can you do to advance projects?
2. Demonstrate an ability to act cross-functionally during your postdoc.
3. It is important to publish, even though some people say otherwise! This reflects well upon your time in academia, and shows that you completed a project with positive results.

Steve Kaiser joined in Pfizer in 2014. He did his postdoc training in Stanford and St. Jude Children's research hospital.

Steve:

1. A lot of luck is involved to be honest!
2. Get the best training possible during your postdoc.
3. For the future: it is crucial to do work you like and are excited about. Look at pharma job ads and think about whether you fit the criteria.
4. Be highly productive.
5. Grad school and postdoc phases are a time to grow up: strive to be reliable and dependable: demonstrate your ability to be self-driven.
6. Personal interactions are very important, but it is still possible to get a job just by sending in a resume (cold, without contacts and networking), so don't give up!

Angela Cone joined ICB international in 2016. She did her postdoc training in the National Center for Microscopy and Imaging research of UCSD.

Angela:

1. Present your work to anyone who will listen: get practice presenting. Ask questions, engage people. Find a mentor that will show you how to communicate.
2. Take an opportunity to mentor an undergrad: follow up with them and troubleshoot problems. This allows you to develop great skills that you can place on your resume: managing others, maintaining relationships with a team every day, and keeps you more productive (you have to keep a schedule)!
3. Take Barbara Preston's Industry Job Search courses, offered by the Office of Postdoctoral and Visiting Scholar Affairs! Register now for the current series: <https://industryjob2017.eventbrite.com>
4. Practice writing up your projects, setting clear goals to be a project leader.
5. Be flexible!
6. Be comfortable being uncomfortable in a new position: there is a learning curve!

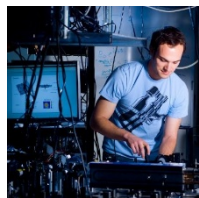
Panel 2

R&D in Science & Engineering (Non-Bio Focus)

Moderator: Pam Bhattacharya, PhD

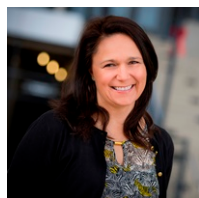
Panelists

Alexander Schafgans, PhD, *Principal Scientist, Cymer*



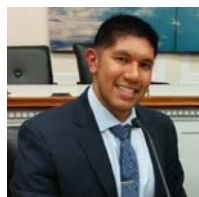
Alexander Schafgans, '05, Ph. D. '11, is a principal scientist at Cymer/ASML, the global leader in developing light sources used by the semiconductor industry to pattern advanced logic and memory. In his role at Cymer, Schafgans helps lead Extreme Ultraviolet (EUV) light source development, advancing the laser produced plasma technology for high-volume industry applications. During his Ph. D. in Physics, Schafgans focused on the infrared and optical properties of correlated electron materials and was selected to receive the Outstanding Graduate Student award upon graduation. He currently serves on the UCSD Alumni Board of Directors and the Undergraduate Scholarship Council.

Natasha Balac, PhD, *Founder, President and CEO, Data Insight Discovery, Inc.*



Natasha received her Master's and Ph.D. in Computer Science from Vanderbilt University with an emphasis in Data Mining from large data sets. Her dissertation focused on creating and applying novel data mining techniques to mobile robots and real time sensor data. She has been with UCSD since 2003. She has also led multiple collaborations across a wide range of organizations in industry, government and academia. She had founded and led the Predictive Analytics Center of Excellence at the Supercomputer Center until 2016. She is currently directing the Data Science Program at Calitz/Qualcomm institute and teaches at the Computer Science Department. Dr. Balac has founded and serves as the President and CEO of Data Insight Discovery, Inc. DID's charter is enabling businesses to discover actionable insight from vast amounts of data.

Ryan Aguinaldo, PhD, *R&D and Systems Engineer, Northrop Grumman Corporation*



Ryan Aguinaldo is currently with the Northrop Grumman Corporation where he functions as an R&D and systems engineer. His primary responsibilities includes contributions to various aspects of radio and optical communications systems and other mission enabling electronic payloads for fighter, unmanned, and rotary-wing aerial platforms. His previous research focused on optical integrated circuits, nanoscale metal optics, and quantum dot solar cells. Dr. Aguinaldo concurrently received the BS degree in microelectronic engineering, with minors in physics and electrical engineering, and the MS degree in materials science from the Rochester Institute of Technology. He received the MS and PhD degrees in applied physics from the University of California, San Diego.

Lydia Zhang, PhD, Staff Engineer, Qualcomm



Dr. Lydia Zhang has dedicated herself to micro/nano semiconductor devices research and development. She has worked on biological micro sensors and actuators, Microelectromechanical systems (MEMS)-based display, Radio frequency CMOS circuit design/layout, and Heterojunction bipolar transistor (HBT) process integration. Dr. Zhang worked for Lucent Technologies in China and she is a staff engineer at Qualcomm Technologies, Inc now. In 2008 Dr. Zhang earned her Ph.D. from the Electrical Engineering Department at Lehigh University, Bethlehem, Pennsylvania; in addition, she is a certified Project Management Professional (PMP).

<https://www.linkedin.com/in/lydiazhangmems>

Gunwoo Kim, PhD, Senior Engineer, NanoSD, Inc.



Gunwoo Kim is a senior engineer in NanoSD Inc., an innovative start-up company focusing on nano/energy material. He received his PhD degree in Materials Science and Engineering from UCSD in 2016, MS degree from University of Tokyo, and Bachelor's degree from Tokyo Institute of Technology. Prior to joining UCSD as a PhD student, he had worked at the material development division in Samsung Electro-Mechanics for nano material synthesis and application in electronic devices for over 4 years. His research interest is on polymer-metal composites for energy saving application, and stimuli responsive soft actuator for smart textile.

Panel Summary

1. Summary of Panelists' Backgrounds. Panelists were asked to discuss their background and career path, and what their current position entails.

- Gunwoo recently earned his PhD from UCSD in 2016, and as his PI founded a startup company, Nano SD, Inc., he transitioned there directly and currently works as a Senior Engineer. Prior to coming to UCSD for his doctorate, Gunwoo worked as a Research and Development Engineer at Samsung Electro-Mechanics, for over four years.
- Natasha earned her PhD in Computer Science from Vanderbilt University, focusing on Data Mining. Interestingly, she came to the US originally on a tennis scholarship and explored different career paths (including law) but eventually ended up in Computer Science. She has been at the intersection of academia and industry, and has worked at the Qualcomm Institute and the San Diego Supercomputer Center, at UCSD. Three years ago she started her own company, Data Insight Discovery, Inc., and serves as the President and CEO.
- Ryan graduated from UCSD with a PhD in Applied Physics, in 2014. He is currently a R&D Systems Engineer in the Future Technical Leaders Program at Northrop Grumman, where his work focuses on Communications and Systems Integration.

- Lydia earned her PhD in Electrical Engineering from Lehigh University. Since then she's been working in the field of microelectromechanical systems (MEMS) and related areas in semiconductor devices research and development. She's been a Staff Engineer at Qualcomm for the past several years.
- Alex earned his BS, MS, and PhD degrees in Physics, from UCSD. About a year before he completed his PhD in 2011, he decided to transition to industry and began looking for job opportunities. Through networking, he was able to build connections to help him find his current position as a Principal Scientist at Cymer, which develops light source technologies for various semiconductor manufacturing applications such as computer chips.

2. **Transition to Industry.** What motivated you to make the transition to industry? What were some key factors that helped you make a successful transition? What were some challenging aspects of the process?

- Panelists' reasons for transitioning included finding the pace of academia to be too slow, and wanting to collaborate and interact with colleagues working in a greater variety of areas than you can typically find in your department at an academic institution. Other panelists had always been interested in learning new things – this was a major reason they pursued their PhDs, and also the reason why they were interested in transitioning to industry and expanding their horizons outside of their thesis topic. Some panelists found that they had valuable skills that they couldn't utilize to their fullest capacity in academia, but knew would be a great fit for industry.

3. **Current Industry Positions.** What is a typical work day like for you? Who do you work closely with? How is R&D in industry different from the research environment in academia?

- Ryan explains that R&D at a large corporation like Northrop Grumman, focuses on work that the company hasn't done before, in order to help differentiate the company's products from the competition. Research is done with this practical purpose in mind, not simply for the sake of discovery, as is often the case in academia.
- Academia focuses on publishing papers as the end goal. However, industry focuses on making products, and based on Gunwoo's experiences in both academia and industry, he feels that there is definitely a gap between the knowledge that's published in papers, and the ability to leverage that knowledge to make products. And narrowing this gap is an important part of what he is working on in his current position.
- As a Data Scientist, Natasha works with Subject Matter Experts (SMEs) in various fields, marketing departments, and many others. In general, she interacts and collaborates with a very diverse group of people.
- In industry, the pace of everyday work is much faster than in academia. In a single day, the number of decisions that have to be made can be equal to a month's worth of decisions in academia.

- Successful industry professionals must be able to make many data presentations where they can distill complex R&D ideas down to simple and succinct explanations. In addition, they need to be effective storytellers – that is, be able to explain their motivation, workflow, and results as a complete story that makes logical sense. These are valuable skills that not everybody has.
- In contrast to academia, where accuracy of data and results is very important, in industry you must be ok with making decisions with less than 100% accuracy in analysis. Time is the biggest limiting factor so you need to be able to do analyses which may not be perfect, but good enough to yield an actionable recommendation that leads to a decision, and then move on.
- **Other relevant skills that are useful in industry:**
 - i. Independent study - the ability to study and research a problem on your own without too much guidance or hand-holding.
 - ii. Project management is a valuable skill in industry. Lydia is a certified Project Management Professional (PMP), which is a distinction earned after a certification exam and a few years of project management experience.
 - iii. Collaboration and interpersonal skills
 - iv. Time management – time is much more of a limiting factor in industry compared to academia.
 - v. Data presentation and analysis – this is a vital skill in industry, as you will have to distill and clearly present complex ideas to audiences of various backgrounds, some non-technical in nature.

4. Dynamic Job Markets and Opportunities

- a. **How has your industry/job market changed since you first entered your field?**
 - Data Science and Artificial Intelligence were once seen as exotic areas which had no practical application. Now they are all the rage and are growing very quickly! It's mostly the attitude towards the field that has changed over the years.
- b. **What is the job market in your respective fields currently like, and what do you think the trajectory will be like over the next 5 years? Are there any topics or skillsets that will be in high demand?**
 - Natasha states that there is a shortage of data scientists in industry and companies are most definitely looking for more! The field has become so popular that the data scientist interview now has a technical component that is used to weed out applicants who are piling on the bandwagon because of its popularity but don't have sufficient technical background in the field.
 - Northrop Grumman is a defense and security company, and Ryan remarks that those particular industries are doing very well now and will continue to grow.
 - Gunwoo mentions that material science and nanotechnology specifically in the context of electronics and high tech industries, will be very important in the future.

- Lydia and Alex agree that it's very hard to predict the job market and this shouldn't be the most important factor guiding your career decisions. Don't narrow your options to just those areas that you think will have positive job market growth - you might miss some areas that you may find really interesting and are really good at! Make sure you really like the area you are working in and you'll be able to find interesting work.
- Keep options open and look broadly. Don't worry about having the perfect skillsets - you'll learn technical skills on the job. Alex mentions that only 1/20 applicants that Cymer hires, has a background specifically in plasma physics (which would be a really close match for a lot of the work that Cymer does). However, the other applicants have a broad physics background and learned what they needed on the job.

5. Recommendations. What recommendations do you have for grad students and postdocs who are interested in R&D jobs, to best prepare themselves? What are some resources that may be helpful?

- For Data Science, Natasha mentions that there are dozens of Meetups which you can search for online and attend to expand your network and get a better understanding of what's happening in the field and what opportunities are available. You can also prepare yourself by trying to gain practical experience through projects, entering [Kaggle](#) competitions, etc. Nowadays there are countless opportunities to build project-based practical experience! Alex adds that no matter what field, experience with real projects is very valuable for industry, even if those projects don't necessarily lead to publications.
- Panelists suggest that international students and postdocs who have to consider visa requirements and restrictions, may find better job opportunities at larger companies, as they have many more resources to address visa issues, compared to small companies.
- At some point, you need to make a decision about whether you want to go the industry or academia route, because the career paths are very different. If you end up going into industry, the more time you waste delaying taking that first step to approach the industry job market, the larger the salary gap will be between yourself and your peers who enter industry right after graduation. Keep in mind that the salary difference between a 1st year postdoc and 5th year postdoc is not that much!
- Don't pigeon-hole yourself. Keep your options open.
- Don't be afraid to apply to positions you aren't completely qualified for.
- Try to collaborate with companies you would like to work with, to get your foot in the door and simultaneously gain hands-on experience. Internships actually are helpful at all levels, not just for undergrads.

6. Audience Questions: A lot of people stress the importance of networking but how do you actually network? What's the approach to doing that without being awkward or annoying?

- Networking describes many approaches to making connections with people in the field you're interested in. It can be reaching out by email or through LinkedIn, scheduling a

coffee chat, going to a networking mixer, or anything else that helps you make a personal connection with somebody.

- Personal connections are meaningful but you should try to use them as a jumping off point to build into a professional relationship. This requires some effort on your part to help build the connection up over a period of time.
- Use a networking opportunity as a two-way interaction where you get to explain what you do and what you're interested in, and they get to do the same, and you both see if there's a match or some common ground.
- Even if the company the other party is from isn't hiring, they may still be able to help you by putting you in contact with somebody else.
- Remember that face to face interactions are **much** less annoying compared to just emailing somebody out of the blue and asking them for a job. And try to genuinely build up a professional relationship with a contact based on common points of interest, instead of just asking for a job.

Panel 3

R&D in Bioengineering and Bioinformatics

Moderator: Abhilash Kizhakke Puliyakote, PhD

Panelists

Jeff Orr, PhD, *Senior Director, Scientific Computing, Vertex Pharmaceuticals*



Dr. Orr received his BS and PhD in Biochemistry from Indiana University, Bloomington. He completed consecutive postdoctoral fellowships in Biochemistry at the Massachusetts Institute of Technology and at The Scripps Research Institute, where he transitioned into a Senior Research Scientist role.

He next joined Vertex Pharmaceuticals in San Diego, where he has been for the past 16 years. He currently serves as the Senior Director for the Scientific Computing Team. In his role at Vertex, he oversees a team of scientists and computer scientists that develops custom software to enable the discovery research efforts across Vertex's four research facilities. Example projects the team has worked on include custom electronic lab notebooks for medicinal chemistry and biology, a corporate research database query and data visualization tool, integration of in-house and third-party software for enabling high-throughput screening and imaging technologies, and a suite of software for managing compound management inventory, ordering, and robotic order processing systems.

Karl Olney, PhD, *Senior R&D Engineer, Medtronic*



Dr. Olney received his B.S., M.S. and PhD degrees in Mechanical Engineering at the University of California at San Diego focusing on computational mechanics and material development for projects funded by DARPA and the Department of Naval research. During his PhD, he also worked as a Graduate Student Researcher at the Los Alamos National Laboratory supporting the development of novel material models. After obtaining his PhD. In 2014, Dr. Olney joined Medtronic, where he currently serves as Senior R&D Engineer in the Coronary and structural heart division supporting the development of next generation transcatheter heart valve therapies.

Raj Krishnan, PhD, *CEO, Biological Dynamics*



Dr. Krishnan received his B.S. in Electrical Engineering at the University of California at Los Angeles and PhD in Bioengineering at the University of California at San Diego. Dr. Krishnan is the founder and CEO of Biological Dynamics, a private molecular diagnostics company in San Diego. Dr. Krishnan developed the technology for his dissertation, pioneering the use of AC

Electrokinetics for blood based diagnosis. The company has raised over 30M in funding and is currently pursuing clinical trials for their first product. Dr. Krishnan was named to the Top 30 scientists under 30 by Forbes magazine in 2011.

John Dobak, MD, CEO, DermTech (could not attend due to a rescheduled surgery)



John Dobak, MD, has been involved in new medical innovation for 20 years. He has founded multiple companies in areas as diverse as cardiac arrhythmia ablation and neuromodulation to aesthetic medicine. Over the last four years, Dr. Dobak has been the CEO of DermTech and the founder of two other dermatology companies, 10xBio and @Derma.

Panel Summary

Moderator-led portion:

1. Introduction and career path

- Karl Olney described his training as a mechanical engineer working on computational models and defense applications. In 2014, Karl moved into the BioEngineering domain in his role as a R&D Engineer at Medtronic. Currently, he continues as a Senior Engineer and described his current projects.
- Jeff Orr started his career as a Biochemist with postdoctoral fellowships at MIT and Scripps Research Institute. He started at Vertex, then moved to the Scientific computing team, where he oversees software development and tools that drive the research efforts. He described in detail about his transition from a BioEngineering role to his adaptation to a computing environment. He developed his software skills to adapt to the computational needs and now serves as the Senior Director of the Computing Team.
- Raj Krishnan founded his company, Biological Dynamics as a spin off from his thesis dissertation. He is currently leading the company through its funding phases and clinical trials for FDA approval. He described his life from his high school and his interests in startups from a young age. He talked about the differences in a large corporate environment versus a startup ecosystem and mentioned some of the challenges that are inherent to a startup company, and having to wear multiple hats, especially in the early days of the company.

2. Top skills and training from the PhD program that helped their careers

The top take-away from each panelist was that the PhD program trains students and postdocs in their way of thinking and approaching a problem, rather than the development of technical skills. They felt the work ethic and scientific method are most appreciated skills that develop through a graduate degree. Karl and Jeff mentioned their transition to different scientific domains and the need to adapt and learn new technologies as needed. Raj described his experiences in hiring and the need to understand business perspectives which is a severely lacking skill among new graduates.

He also recommended attending workshops and training seminars to acquire new skills, specifically in non-technical domains.

3. Advice for students in approaching contacts or recruiters

The panelists emphasized the need for expanding networks and contacts. Collaborating on projects with other teams provides an opportunity to expand your network and showcase your skills. Each of them mentioned the need to keep in touch with contacts and developing a good rapport instead of reaching out only when looking for jobs. They were also open to networking requests and to be contacted for advice and mentoring at any time. Developing a mentor contact who might be in the same career path that you are looking for, is an excellent way to get sound advice and develop a network at the same time. They also mentioned that the first contact is more successful and bound to lead to further conversation if it is based on developing a rapport, rather than if the very first contact is for job enquiries. This is different in case of recruiters and HR groups, where they say you can be direct about your job interests.

On a similar note, the panelists gave advice about interviewing. They recommended attending mock interviews to develop the comfort and familiarity of interviewing. Karl mentioned his interview process at Medtronic and how his team was impressed with the model he made, emphasizing the need to let your skills talk for you. Raj provided some insights from the other side of interviewing, with his experience in hiring for a startup. They talked about how to highlight your interests and how your skills complement the needs of the company. They also remarked on how an interview is a two-way process and you need to ask the right questions to gauge if the company is right for you at the same time. They encouraged students and postdocs to consider the training and development programs at companies to understand how they can grow and learn and take advantage, especially when starting out in a junior position. Jeff talked about how Vertex offers development programs, allowing new hires to explore other opportunities, in other domains to help understand career interests and goals. Karl mentioned that Medtronic has similar programs for their new hires. He also mentioned how internships can help develop networks and allow you to get firsthand inside knowledge about what the job entails.

Audience questions:

- 1. How much research freedom do you get in the industry as opposed to academia?**
- 2. Follow-up: How do researchers in the industry accommodate the fact that research can be terminated on financial merits and they are forced to switch to other projects?**

All panelists agreed that the company is driven by its bottom-line. Industrial research is driven by what makes a good product rather than solving an abstract problem. However, they made it clear that senior researchers may have greater freedom in developing long-

term exploratory projects. This is also a point of difference between large corporations and startups. Raj mentioned that as a small company with limited funding available, the focus is on getting the product developed and ready for the market rather than provide resources for exploratory research without a specific market goal in mind. Jeff remarked that as a large company, Vertex allocates significant resources towards long-term research, sometimes even in basic science. The panelists compared the chain of allocation to academia, where research funds depend on the strength of the research grant application and how research funds are decided on its research merit, investigator credentials and require periodic reviews. No organization presents funds for free-reign research or without systems in place for appraisals and reviews. Karl talked about his personal projects in developing new technologies for cardiac surgery. He mentioned how he developed these technologies in his personal time and then presented a promising model to the CTO, which led to significant resources for further development and patent credits. He mentions this as an example of how a company can invest resources on potential products and in employee ideas provided there is proof of concept or preliminary data supporting this research hypothesis.

Panel 4

Teaching

Moderator: Jessica Sowa, PhD

Panelists

Dawne Page, PhD, Professor and Chair of Biology, Point Loma Nazarene University



Dawne Page has spent the past 14 years teaching students from varying degree levels (high school to the graduate level) in the subject areas of biology, genetics, research methodology and immunology. She is currently both a Professor and Chair of Biology at Point Loma Nazarene University (PLNU). Prior to her career in teaching at PLNU, Dawne received her Honors BS in Biochemistry from PA State University. She then graduated with a PhD in Immunology from the University of California, San Francisco, followed by a postdoctoral position in basic immunology research. Dawne then maintained two part-time positions at UCSD: Associate Project Scientist and Science Academic Coordinator at the Center for Research in Educational Equity Assessment and Teaching Excellence (CREATE). Here, Dawne had the experience of working with local school districts to provide professional development to K-12 teachers in science. Following her experience with CREATE and then as the Director of SEASAND, in which she collaborated with and improved the science education in local school districts, Dawne began working with PLNU.

Marie McMahon, PhD, Professor of Anatomy and Physiology, San Diego Miramar College



Dr. McMahon is originally from Los Angeles and began her educational path at 18 by taking a few classes at Pasadena City College (PCC). She then attended Flinders University in Australia where she completed a Bachelor's of Science Degree in Biochemistry and Physiology. This was followed by a 1 year Honors Degree in Lymphatic Anatomy and Physiology. She was then awarded a full postgraduate scholarship and completed her Ph.D. (in lymphatics) at the Flinders University Medical Center (Australia) in 1997. After finishing her Ph.D., she commenced a Postdoctoral Research Fellowship at the University of South Alabama, in Mobile, Alabama. It was at this time she realized her significant preference for teaching over research! Her aim was to return and teach at a California Community College - this desire was deeply influenced by attending PCC. She taught part-time at several community colleges here in San Diego until obtaining a full-time faculty position at Miramar College in 2003. She served as Biology Dept. Chair from 2007 until 2015, then became the Academic Senate Present for Miramar College (the position she currently holds) - while continuing to teach Human Anatomy every semester.

Steve Weinert, PhD, *Professor of Psychology, Grossmont Cuyamaca Community College*



Steve Weinert was born and raised in Vermont. He came to San Diego in 1988 to go to college at SDSU and to compete in Track and Field. He graduated with a BS in Psychology and was admitted to the SDSU general experimental Psychology program in 1993. He worked in the Center for Behavioral Teratology with Dr. Ed Riley and Dr. Jennifer Thomas until 1997 focusing on brain changes due to pre and post natal alcohol exposure. In 1998 he earned his single subject teaching Credential from Chapman University and started teaching High School science (Biology, Chemistry, Earth Science and Psychology). He taught part time at Cuyamaca College from 1994 until 2000, when he was hired full time and went on to earn tenure in 2006. He currently teaches all the lower division psychology courses at Cuyamaca College.

Sarah Stockwell, PhD, *Assistant Teaching Professor, UCSD*



Sarah Stockwell was born in San Diego and received her B.A. in English Literature from Swarthmore College. She spent a year in rural El Salvador teaching math, English, and chemistry, and worked as a computer engineer at Qualcomm Inc. for over six years. In 2002, she began a Ph.D. program at Cornell University, studying population genetics and the evolution of transcriptional regulatory networks with Andy Clark. She completed an IGERT fellowship in nonlinear dynamics, and used those techniques in her dissertation research on mutational robustness in simulated genetic networks. While at Cornell, she also studied evidence-based teaching methods in biology and independently developed and taught a semester-long seminar on evolutionary biology. After receiving her Ph.D, she returned to UCSD to do research in Scott Rifkin's lab, using microfluidics to study memory in the galactose pathway of budding yeast. As an IRACDA postdoctoral fellow, she guest-taught at San Diego State University and San Diego City College. In 2015, she accepted a tenure-track position as an Assistant Teaching Professor in the Ecology, Behavior, and Evolution section of Biology at UCSD. She teaches evolution, ecology, and statistics, and is developing a research program studying the effectiveness of new curriculum in those fields.

Rae Robertson-Anderson, PhD, *Assistant Professor and Chair of Physics & Biophysics, University of San Diego*



Dr. Rae Robertson-Anderson is Associate Professor and Chair of the Physics and Biophysics Department at the University of San Diego where she has been a faculty member since 2009. Dr. Anderson received her BS in Physics from Georgetown University in 2003, and her PhD in Physics from UCSD in 2007. She completed her postdoctoral research training in the Molecular Biology department at The Scripps Research Institute. Her PhD and postdoctoral research were funded by an NSF Graduate Research Fellowship and NIH postdoctoral training fellowship. Since her initial appointment at USD, she has received several prestigious research and education grants including

an NSF CAREER Award and Air Force Young Investigator Award for her soft matter biophysical research and development of the undergraduate Biophysics program at USD.

Panel Summary

Moderator Questions:

What drew you to a college teaching career, and what do you find most rewarding about it? What is the most challenging aspect of your job?

- Dawne: Parents not letting go, getting grants at a small community college
- Marie: Helping students find out how to learn
- Steve: Students only coming to class and doing no work outside of class
- Sarah: When teaching an introductory class, a lot of students are just adjusting to and struggling with starting at a university
- Rae: Balancing all responsibilities and managing time

Apart from teaching classes, what other types of work do you do? What does your typical workday look like?

- Rae: 2 classes each semester, classes /chair/ department reviews, supervising students, researchers, and staff, assessment planning, class prep, grant writing. Every day is different.
- Sarah: Preparation for classes (material), managing ~20 TAs for class logistics, email/ solving student problems
- Steve: Committee service: chair of Technology Committee, on student service committee, sabbatical leave committee. Also 4 classes / semester with ~34 students per class
- Marie: contractual obligations at community college – more than just teaching, lots of committees. Faculty also run the show at a community college.
- Dawne: class – 3 labs, 1 class (with chair release). Service on rank and tenure committee, writes grant every year. Also class preparation with lots of student feedback, and grading.

What specific experiences or skills would you say were most helpful in transitioning from graduate school/postdoc to your current position?

- Dawne: Teaching experience (taught evening classes as adjunct), mentoring other grad students/ postdocs, and grant writing.
- Marie: Organization and presenting
- Steve: SICCA- San Diego Imperial Community College Assoc. Spend time in a classroom with good and bad teachers to learn what works and what doesn't.
- Sarah: Reflective teaching – not just teaching, but write notes on what works and what doesn't. Must write teaching statement and teaching philosophy.

- Rae: DBER – discipline based education research, google “trends in pedagogy”, “student based teaching”, “evidence based teaching”.
- It’s OK if you don’t have experience yet. Try teaching summer session as a postdoc or evenings. Get experience writing papers + grant writing.

What are the qualities of effective teachers?

- Rae: Passion and being open to learning and adjusting your style of teaching.
- Sarah: Finding out what students understand by getting feedback to modify teaching style.
- Steve: Must be really honest – if you don’t know something, don’t make it up!
- Marie: Make sure students know: what kind of workload, clear expectations, how enthusiastic you are about what you do.
- Dawne: Teaching is a conversation. The flipped classroom – students work in groups and teacher is facilitator and moderator to guide discussion. What the best college teachers do is a good book to look up.

Audience Q&A:

Who have some of your mentors been?

- Dawne: Teachers themselves – you are assigned a mentor when you begin teaching at a community college.
- Marie: Established teachers at your institute.
- Steve: Academic president and assigned professor mentor.
- Sarah: Ask for informational coffee and lunch dates for advice.
- Rae: Faculty you can relate to – see part of yourself in them and things you admire.

Is teaching night classes possible for someone on a J1 visa?

- Steve: You need a working visa.

I am currently teaching as an adjunct; how can I get a more permanent position?

- Rae: Full time lectures (3-4 year contracts) coming up with ways to make them more tenure-track like. Talk to Chair of Depts. about availability.
- Sarah: Division of Biology at UCSD – 3-4 openings in the next few years
- Steve: The Registry on google – job postings for teaching jobs. Apply and sell yourself during interviews.

How do you reconcile your passion for science with students who don’t care?

- Steve: I don’t mind if not all the students care – I care about the passionate students.
- Marie: I’m OK with the idea that not everyone will care or excel.

- Dawne: Find something they will be passionate about.
- Sarah: Be careful about interpreting lack of participation as lack of caring.
- Rae: Find out about your audience - there are different ways to connect to different audiences. There will still be those that don't connect and you have to be ok with it. The phenomenal students make it worth it.

How competitive is it at a community college, and are most positions adjunct?

- Steve: Most are adjunct. Very competitive. Look up student demographics and know your student audience.
- Marie: 75% adjunct, 25% full (hiring freeze 2008-present, just lifted).

What are “good signs” for institution to work at?

- Rae: Visit as much as possible before accepting a position. How happy are faculty and students? You will get the sense of the culture. Ask how long people have stayed – good indications.
- Sarah: Check expectations for bringing in grants and resources offered – do they match up?
- Steve: Check administrative staff – are they happy?
- Marie: Do an informational interview with the division chair and visit campus.
- Dawne: Check tenure requirements. What % of new faculty get tenure?

Panel 5

Clinical and Regulatory Affairs

Moderator: Juliati Rahajeng, PhD

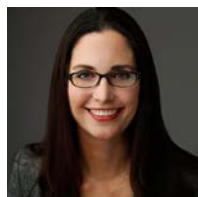
Panelists

Joanne McNelis, PhD RAC, *Clinical and Regulatory Scientist*, Cato Research



Joanne McNelis is a Scientist at Cato Research, an international Clinical Research Organization (CRO) that provides regulatory, clinical and scientific services to support the development of drugs, biologics, devices and diagnostics. At Cato research, Joanne is a participant in the Fellows program, a 12-month in-house training scheme. Prior to transitioning into industry, Joanne received her Ph.D. in Endocrinology from the University of Birmingham, UK, and postdoctoral training in the lab of Prof. Jerrold Olefsky at UCSD. Joanne holds a professional certificate in regulatory affairs from Regulatory Affairs Professional Society (RAPS). She is a member of San Diego Regulatory Affairs Network (SDRAN), RAPS and SOCRA.

Allison Komiyama, PhD, *Principal Consultant*, AcKnowledge Regulatory Strategies



Allison Komiyama obtained her BA in Molecular and Cell Biology with an emphasis in Genetics and Development from University of California, Berkeley in 2003. She worked as a technician in a laboratory at the University of Pennsylvania for one year before being accepted in the Biology program at Stanford University. She received her PhD in Neuroscience from Stanford in 2009 and moved to Washington DC soon after. In DC, she became a postdoctoral scientist in the Office of Science and Engineering Labs, as well as a lead reviewer in the Office of Device Evaluation, in the Center for Devices and Radiological Health at U.S. FDA in Silver Spring, MD. After her time at FDA, Allison moved back to California and accepted a position as a project manager and regulatory affairs manager at an in vitro diagnostic medical device company. A year later she went on to become a Senior Regulatory Specialist at a medical device consulting company for two years. In May 2014, Allison started AcKnowledge RS, helping medical device companies from all around the world in developing their strategies to get their technology into the US market.

Lily Alvarez-Jaimes, PhD, Quality Assurance Manager, MedWaves



Lily received her BS in Microbiology in 1998 and PhD in Biology in 2004 from the University of Puerto Rico. She pursued her postdoctoral training in Neuropharmacology at The Scripps Research Institute in 2005 and made a transition into the pharmaceutical industry as a postdoctoral fellow in the Neuroscience Team at Janssen Research and Development in 2009. This latest experience spurred her interest in the regulatory aspects of clinical development. In 2013, she was offered an internship in Quality Assurance/Regulatory Affairs at MedWaves, Inc. and continued working as Quality Assurance Manager for MedWaves, Inc. Lily, simultaneously, worked as a Clinical Research Coordinator at UCSD / Rady Children's Hospital from 2014 through 2016. She is an active member of the San Diego Regulatory Affairs Network (SDRAN) and have served as Leader and Communications Manager for the US Regulatory Affairs Certification (RAC) exam study group that is organized by the SDRAN Education Committee.

Michelle Mazzoni, PhD RAC, VP of Regulatory Affairs and Quality, Dauntless Pharmaceuticals



Michelle Mazzoni received her Bachelors of Mechanical Engineering from the University of Minnesota in 1984, her PhD in Bioengineering from the University of California San Diego (UCSD) in 1989, her Regulatory Affairs for the Biomedical Industry certificate from the UCSD Extension in 2004, and her Regulatory Affairs Certification (RAC) from the Regulatory Affairs Professional Society (RAPS) in 2004 for US regulations, and in 2006 for both Canadian and EU regulations. In 1996, Michelle started her career as a research scientist at Alliance Pharmaceutical Corp. and eventually became Senior Director of Biological Research. In 2003 with the divestiture of an Alliance asset to create the company IMCOR Pharmaceuticals, Inc., she was the Senior Director of Biological Research. In 2004 with her new knowledge in regulatory affairs, she joined TargeGen, Inc. as a Director and then moved up to Senior Director of Regulatory Affairs and Drug Development. In 2008, Michelle took the position as the head of regulatory affairs at SGX Pharmaceuticals until the company was acquired by Eli Lilly and Company within months of her joining the company that led to her next position as the Vice President of Regulatory Affairs and Quality at Cebix, Inc. in 2009 and held that position until the company ceased operations in 2015. For the past two years, Michelle has been the Vice President of Regulatory Affairs and Quality at Dauntless Pharmaceuticals, Inc. where she is responsible for regulatory strategies and operations, quality compliance, and nonclinical development for the company's expanding pipeline of drugs, and additionally, she does regulatory affairs consulting for small biotech companies.

Evelyn Walenta, PhD, *Clinical Research Associate, QuintilesIMS*



Growing up in Austria, Europe, Evelyn received her BSc in Technical Chemistry, MSc in Biotechnology, Biochemistry and Food Chemistry, and PhD in Biomedical Engineering from the University of Technology, Graz, Austria. During her PhD, she spent one year at the University of California, San Diego (UCSD), to where she returned for a position as postdoctoral researcher doing preclinical research in the field of diabetes and obesity in 2013. During her postdoctoral training, Evelyn was the Vice Chair of Career Development Programs of the UCSD Postdoctoral Association. In addition, Evelyn obtained a Micro-MBA certificate from Rady School of Management in 2014 and started with the Clinical Trials Design and Management Certificate from UCSD Extension in 2015. Last year, she accepted a position as Clinical Research Associate at QuintilesIMS.

Panel Summary

Joanne works as a Clinical and Regulatory Scientist at Cato Research, a contract research organization (CRO) that provides integrated services to pharmaceutical, medical devices, and biomedical companies through clinical studies to allow regulatory approval for their drugs, biologics, and medical devices. Joanne works with multiple projects at a time to ensure that each product/project gets FDA approval for marketing.

Allison Komiyama started her own company, AcKnowledge RS, two years ago. Her company assists medical device companies from all over the world to get FDA approval for marketing in the United States.

Lily works as Quality Assurance Manager at MedWaves. Her company uses temperature- and frequency-based feedback mechanisms to deliver microwave energy for biomedical applications. Lily's job is like a police in ensuring that products generated by MedWaves meet their quality standards.

Michelle works as VP of Regulatory Affairs and Quality at Dauntless Pharmaceuticals, which manages multiple clinical assets. Her company employs expert consultants that specialize in the unique requirements of a given asset so that each asset can be successfully approved by the FDA and delivered into the market.

Evelyn works as a Clinical Research Associate at QuintilesIMS, which is a multinational company that serves the combined industries of health information technologies and clinical research. Her roles include clinical monitoring and data analysis.

Joanne and Evelyn transitioned into their roles in clinical and regulatory affairs directly after their postdoctoral trainings at UCSD, whereas Lily did her second postdoc at Janssen before her transition. Michelle worked as a scientist before her transition into regulatory affairs. Obtaining Regulatory Affairs Professional Society (RAPS) or UCSD Extension certificates in regulatory and clinical affairs field helped Joanne, Evelyn, Lily, and Michelle to transition into the field. Obtaining a certification in Clinical and Regulatory Affairs field is not a must to transition into the field, but it certainly helps. It shows that one is serious in making the transition. For

Allison, her postdoctoral training in the Office of Science and Engineering Labs, as well as being a lead reviewer in the Office of Device Evaluation in the Center for Devices and Radiological Health at U.S. FDA, got her into regulatory field.

For their current roles, all panelists think that a PhD is required. Evelyn mentioned that in the past, her role did not require a PhD. However, recently QuintilesIMS would like their CRAs to be able to analyze data and hence, it requires a PhD. Being able to communicate with other people in the companies or clients is also an important factor in performing their jobs. For example, Lily stressed the importance of being able to be a good police in her role as a Quality Assurance Manager, but at the same time, she said it is also crucial to be respectful to each other. Besides having excellent verbal communication skills, having outstanding written communication skills is also critical.

Their typical day at work can vary from day to day, although most are very flexible. Evelyn sometimes has to travel to various clinical sites, but at other times, she can stay in her office or at home doing data analysis or working on documents. Allison has a home office that she shares with her four employees. On a typical day, she's either on the phone talking to clients or working on documents for submissions. Lily currently works part time, but works at regular office hours. Joanne also works at regular office hours, juggling between meeting, visit to clinical sites, and working on documents. Michelle's typical day at work involves meetings and working on documents for submissions.

Panel 6

Consulting and Marketing

Moderator: Jelena Ostojić, PhD

Panelists

Kate Hanham, PhD, *President & Founder*, Mentara Consulting



Dr. Hanham has acted as an advisor to Boards of Directors and served as an interim C level executive. She has held lead responsibilities in critical communications with the FDA and international regulatory agencies. She has consulted for organizations ranging from start-up biotechnology to top ten pharmaceutical companies. She has also provided assessment of technology, product development, clinical and manufacturing operations for financial groups seeking to invest in biotechnology.

Todd Johnson, PhD, *Consultant*, Boston Consulting Group



Todd D. Johnson is a consultant for The Boston Consulting Group in their Los Angeles office. He earned his Ph.D. from the department of Bioengineering at UCSD. His research in Dr. Karen Christman's Lab focused on developing and testing naturally derived injectable biomaterials for treating cardiovascular diseases. Todd has developed two new biomaterials derived from human tissues. The first material was designed as a potential treatment for heart failure after a heart attack and the second was for treating peripheral artery disease.

Melanie Nelson, PhD, *President*, MRN Consulting



Melanie Nelson, PhD., is the president of MRN Consulting, Inc., a company that provides consulting services in scientific informatics and project management. Dr. Nelson has an extensive pharmaceutical and biotechnology industry experience in project management, scientific IT, scientific data management, and bioinformatics. She works with companies and academics on long-running projects, short discussions about specific management concerns as well as management training courses and coaching.

Clifford Woodford, PhD, *Consultant*, L.E.K. Consulting



Clifford Woodford is a life science consultant for L.E.K. Los Angeles. He earned his PhD from the department of Chemistry and Biochemistry at UCSD. Clifford did his graduate research in the laboratory of Dr. Roger Y. Tsien, a 2008 Chemistry Nobel Laureate, where he developed the best-in-class molecular probe

for high resolution fluorescence imaging in the brain. He coordinated numerous successful collaborations in academia and industry for the application of the developed probes, including their first use in living mice and mouse brain slices, opening up insights into neurodegenerative disease.

Tracy T. Yeo, PhD, *Managing Director, ChinaBio Group LLC*



Dr. Yeo is the Chair of the SABPA Education and Career Development Committee. She is the Managing Director of the consulting practice at ChinaBio Group, a multinational management consulting firm focusing on China's life science industry and beyond. She has lead more than 40 consulting projects in China and global development, partnership, and commercialization strategies for leading biotech and pharmaceutical companies.

Panel Summary

- 1) All panelists come from academic background but have made the transition to consulting at different stages of their career; two have held professor positions, one has been a group leader in a biotech company and two have transitioned after completing their PhD degrees. Four of the panelists manage/work as analysts in small-to-mid-size consulting companies while one is an analyst in one of the biggest management consulting firms.
- 2) Panelists describe their day-to-day work in terms of projects they are currently participating on. For early career analysts, the working environment differs between mid-size and big management consulting companies. Both entail intense office teamwork, but the latter usually involves extensive travel to client's site as well.
- 3) All panelists agree that consulting is a good opportunity for holders of life science PhDs to leverage the skill set developed during their academic career. Logical thinking, data management, and problem solving skills are usually sharpened during academic training. Scientific publications are not so relevant in a canonical sense, but can be used to point to strength in leadership, writing or teamwork. Good communication skills are at the very core of a consulting job, given the importance of teamwork and interaction with clients. Indeed, being an efficient communicator has been underlined as essential by all panelists.
- 4) Experience in consulting is valuable as a stepping stone for other types of management/business/marketing career paths and therefore it is very competitive. Academic PhDs are encouraged to network with consultants, participate in consulting activities and do their research on companies before applying in order to have a clear idea about whether this line of work actually aligns with their career goals. A way to be exposed to consulting while still in academia is to join the Advanced Degrees Consulting Club at UCSD (APDCC UCSD) which offers the opportunity to work on real client cases teamed with the club members.

Panel 7

Scientific Writing and Communication

Moderator: Sudipta Das, PhD

Panelists

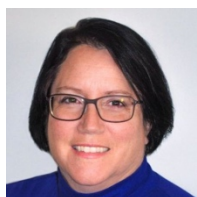
Jessica Yingling, PhD, *Founder & President*, Little Dog Communications



Jessica Yingling received her Ph.D. in Biomedical Sciences from UC San Diego. After achieving her doctorate, Dr. Yingling transitioned to PR and communications in her position as account executive at Porter Novelli Life Sciences. She then went on to become Director of Corporate Communications at Fate Therapeutics, where she built and executed a complete corporate communications plan that established Fate as a pioneering company in stem cell medicines and led to numerous company awards and recognitions.

Dr. Yingling then founded her own company, Little Dog Communications, to work with the “little dogs” — companies and organizations, both small and big, that are at the leading edge of life science innovation. These groups are developing tomorrow’s medicines and re-imagining the future of healthcare through research, drug discovery and new technologies. With biotech, healthcare and non-profit organizations, Jessica helps companies tell their story and reach their audiences through strategic thought leadership and communications programs.

DeeAnn Visk, PhD, *Principal Writer*, DeeAnn Visk Consulting

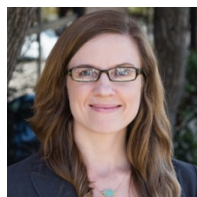


Dr. DeeAnn Visk, PhD, is a freelance medical writer and editor specializing in pharmacogenetics, high throughput screening, genetics, and cell culture. She has worked on writing and editing scientific peer-reviewed papers, news articles, abstracts, posters, technical notes, and white papers. Working in the field of medical writing since 2013, she is happy to mentor new comers.

In addition to her business, Dr. Visk is active in several local non-profits: she is president of the Association for Women in Science, San Diego chapter (AWIS-SD) and on the Communications Committee for the San Diego Entrepreneurs Exchange (SDEE). A member of the Pacific Southwest chapter of the American Medical Writers Association (AMWA-PacSW), she enjoys attending their career development events.

Dr. Visk is a proud graduate from the doctoral program of the Division of Biology at UCSD. When not writing or volunteering, Dr. Visk can be found raising her two kids, hiking, and scolding three backyard hens in the San Diego area.

Heather Buschman, PhD, *Senior Manager Communications and Media Relations*, UCSD Health Sciences



Heather Buschman earned her Ph.D. in Molecular Pathology at UC San Diego. She also completed a health communications internship in the National Cancer Institute's press office and spent her first years away from the bench as a science writer at The Scripps Research Institute. She then served as the Scientific Communications Manager at Sanford-Burnham Medical Research Institute for three years.

Dr. Buschman is currently a Senior Communications and Media Relations Manager for UC San Diego Health, where she covers biomedical research in press releases, newsletter articles, magazine pieces, a podcast, and more.

Tiffany Fox, *Public Information Representative*, Qualcomm Institute, UC San Diego



Tiffany Fox is a Public Information Representative for the Qualcomm Institute at UC San Diego, as well as an award-winning public speaker. She has offered research communications training to researchers from various campus departments of UC San Diego across a wide range of disciplines. She writes press releases, web articles, and a [research communications newsletter](#) about the world's most cutting-edge research in the areas of health, energy, environment and cultural heritage. Prior to coming to UC San Diego, Ms. Fox was a columnist for the San Diego Union-Tribune for 10 years. She is a freelance journalist and has written for local, national and international publications on a multitude of topics spanning science, engineering, technology and the arts. A mother of two, she is also a certified yoga teacher and served in Africa as a Peace Corps volunteer.

David Brin, PhD, *Independent Novelist/Science Fiction Writer*



[Dr. David Brin](#) is an astrophysicist, inventor, futurist and New York Times bestselling author with books translated into 25 languages. His novels include *Earth*, *Existence*, *The Postman* (filmed in 1997 by Kevin Costner) as well as Hugo Award winners *Startide Rising* and *The Uplift War*. A patent-holding inventor, he frequently speaks about science and future trends at company events, think tanks, public agencies, and has appeared on numerous television shows including *Nova*, *The Universe*, and *Life After People*. With degrees from Caltech and the University of California, San Diego, Dr. Brin serves on advisory panels ranging from astronomy, NASA innovative concepts, nanotech, and SETI to national defense and technological ethics. His non-fiction book "The Transparent Society: Will Technology Make Us Choose Between Privacy and Freedom?" garnered the prestigious Freedom of Speech Prize from the American Library Association.

Panel Summary

A summary of the panelists' background, career paths to their current position, and how they got to where they are now:

- The broad focus of the panelists' career paths was to take complex scientific advancements and distill the message into an informative and interesting message catered to broader audience.
- 3/5 panelists (Jessica, DeeAnn and Heather) were PhD graduates from UC San Diego and they started their transition into a career in writing while in grad school.
- One of the panelists (Tiffany) majored in journalism and served as columnist at The San Diego Union-Tribune before taking a position at the Qualcomm Institute at UC San Diego as a Public Information Representative. Tiffany continues to work as a freelance writer and authors a research communications newsletter called *Research Refined* (tinyletter.com/researchrefined).
- One of the panelists (DeeAnn) described herself as being "NPR junkie", which encouraged her to find ways to express herself to the non-scientific audience.
- Heather described the experience that she gained as a health communication intern at the National Cancer Institute's press office as particularly helpful to hone her skills as a science communication writer.
- The only science fiction writer among the panelists, David became interested in writing while pursuing his PhD in Space Science at UC San Diego. He found writing as a means to express his thoughts and break the "rigid boundaries" created by subject definitions of mathematics, physics, chemistry or biology.

A typical work day for the panelists:

- Overall, a typical work-day seems to be much more variable than the predictable work day of an academic bench scientist.
- A majority of the panelists start their day early, especially if their current project involves clients in the east coast time zone.
- Most of the panelists' day comprises of meetings with clients to discuss strategy, communicate with team on where things are, stay up-to-the minute on news during the day, and pitch relevant news to clients.
- One of the panelists described her day spent on reading articles, working on a press release or Q&A, working with the company designer to find a visual way to present an idea or research, and sometimes proofreading her team's work.
- Heather talked about her daily roles in compiling an email newsletter tailored for patients, and writing press releases for the non-scientific audience about the newly published research articles by UCSD researchers. She also talked about her podcast about science

and discovery that she started about a year ago, called *N Equals One* (<https://health.ucsd.edu/news/Pages/Podcasts.aspx>).

- DeeAnn spoke about wearing different hats as she runs her own business, for example she takes care of PR, marketing, sales, maintaining the website, getting payment checks from clients, and so on.

Recommendations for postdocs and graduate students to best prepare themselves for scientific writing jobs:

- Panelists recommended to take on some extra work to get writing experience. Some easy ways to gain experience is by starting a blog, finding freelance work, volunteering for science outreach program, and engaging scientists on social media platforms such as LinkedIn or Twitter.
- One of the panelists recommended utilizing resources at UCSD Career Center to build upon your science writing experience.
- Some panelists also suggested taking writing courses at UCSD Extension (<https://extension.ucsd.edu/courses-and-programs/technical-communication-certificate>)
- Panelists also suggest to sign-up for pharma and biotech companies e-newsletters to learn about the current trends and issues in healthcare industry. Some useful resources mentioned by one of the panelists on her website: *Bio Smart Brief* (<http://www.smartbrief.com/>), *MedCity News* (<http://medcitynews.com/>), and *Xconomy* (<http://www.xconomy.com/>).
- All panelists emphasized on networking and attending social networking events
- DeeAnn also mentioned Association of Women in Science - San Diego (<http://www.awissd.org/>) as a useful networking tool.

Panel 8

Project Management and Strategy

Moderator: Jennifer Yang, PhD

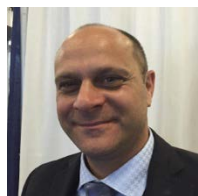
Panelists

Irene Ch'en, PhD, *Associate Director, Clinical Program & Alliance Management, Genoptix*



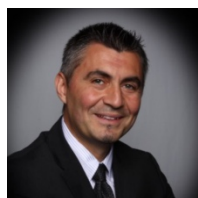
Irene Ch'en received her Bachelor of Science degree in Biochemistry and Cell biology at UCSD, Revelle College and completed her doctorate in Immunology at UCSD under the direction of Dr. Stephen Hedrick. After completing 2 years of postdoctoral training at USCD, Irene worked at Baxter BioScience in the Technical Services department supporting biologic manufacturing in a cGMP environment. Following Baxter, Irene became a Field Applications Scientist/Associate Product Manager at Aushon BioSystems assisting customers in biomarker testing needs. Irene is currently enjoying her role in program and alliance management at Genoptix Medical Laboratory, a Novartis company, supporting exciting oncology clinical trials with companion diagnostics. In her spare time, Irene enjoys spending time with friends, being active, and baking 1000 cupcakes in a day.

Lewis Vann, PhD, *Senior Business Development Manager, The Jackson Laboratory*



Lewis was awarded his Ph.D. from the University of Cambridge in 1997, where he focused on biochemistry and metabolism of nuclear inositol lipids. He then moved to US for his Post-Doctoral research; first at Johns Hopkins University, and then the National Institutes of Health; focusing on inositol and sphingolipid-mediated signal transduction pathways. In 2010, Lewis transitioned to a customer facing position, and is now Sr. Manager of Business Development for the Jackson Laboratory's in vivo services division; focusing on therapeutic companies and academic institutions who wish to utilize JAX's humanized mice, or outsource pharmacology projects in the areas oncology, immuno oncology, neurobiology and metabolic disease.

Dragos Craciun, PMP, *Senior Project Manager, Bofl Federal Bank*



Dragos Craciun, PMP, is a Certified Scrum Master, with over 17 years of international experience (United States, France, Germany, Denmark, Sweden, Norway, Finland, Latvia, Poland, Canada) coordinating medium to large-scale projects from initiation through delivery, including scope definition, project objectives, cost/benefit analysis, business case, planning, implementing and closure. Dragos' specialty is in designing, implementing, testing and delivering Smart Card Payment Solutions (EMV) for Banking/Finance industry. He contributed to the creation of the PM "Toolbox" for GE Capital.

Beatrice Marturano, PhD, *Associate Clinical Project Manager Director, Quintiles*



Beatrice Marturano, received her doctorate degree in Pharmaceutical Chemistry at the University of Padova, Italy and has completed the “Clinical Trials” Professional Certificate at the UCSD extension and Project Management Certification from the Project Management Institute (PMI). She started her career at the Burnham Institute, La Jolla, studying neurobiology and gene expression and later moved to Italy to work at Glaxo SmithKline in the microbiology department before moving back to San Diego to work at Isis Pharmaceutical and Diversa as Sr Scientist. Finally, Beatrice joined Quintiles in 2005 and started her career in managing clinical trials. As a project manager, mainly in the area of oncology, she manages and coordinates efforts of cross-functional project teams; provide guidance and prioritization of project tasks on the critical path to ensure project milestones are met. She serves as project liaisons with the customer to ensure communication is maintained, expectations are clearly cascaded to the team, and reporting schedules are adhered to.

Jean-Baptiste (JB) Passot, PhD, *Senior Project Manager, Brain Corporation*



Dr. Jean-Baptiste Passot graduated from University Pierre and Marie Curie with a PhD degree in Computational Neuroscience. His research and efforts aims at bridging the technology gap from neural science research to commercialized robotic products. In 2012, he joined Brain Corporation, a for-profit R&D and product company with a focus in robotics and artificial intelligence. Since 2015, Dr. Passot has been both the project manager and principal scientist leading a team of robotics engineers, computer scientists and software engineers in the research and development of a next generation mobile collaborative robotic navigation system.

Panel Summary

1. How did you get to where you are now?

Most panelists got their first project management jobs through internal transition. They worked in technical roles and those associated with project management and then got recognized so became the project manager (PM) in the same company. A couple of them gained the project management experience from previous companies and then through networking got their first PM job in a different company.

2. Suggestions for those who are interested in project management.

The common way is to work hard in a technical position and then help with management to gain experience. The faster way is to take an associate PM position to get experience then become PM. The PM position requires a lot of interaction with people as well as a lot of traveling. You should

follow your personality. If these are what you like, PM is a right position for you. The advantage of PhDs in project management is that they are able to see out of box to find better solutions and manage risks. A good resource is the UCSD Extension clinical trial course.

3. What is your typical day like?

Basically, interact with people through emails, phone calls, meetings and discussion as well as a lot of travel.

4. For a PM, you don't have power to control people, how can you make sure a project is completed?

a) A PM doesn't deliver results and instead only coordinates to maintain the pace of the project. PMs must motivate team members to have things done before the deadlines by building up friendship and trust with them and rewarding them through emails or internal prizes. It is important not to tell team members directly what they should do or should not do. When projects go well, team members get the credit but when there is something wrong, the PM takes the responsibility. Things may not always go the way you like but you need to learn how to deal with it.

b) It is important to empower members to make them responsible and build up the gut sense to tell if a person is responsible or not (this can often be done through the first interaction, even by a phone call). The next step is to then remove irresponsible members from the team.

5. How do you evaluate/judge people?

There is a very clear way to do evaluation because every team member has specific role and task. It is measurable by report and status check.

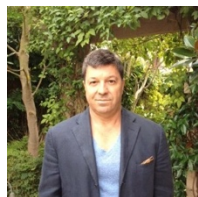
Panel 9

Business and Entrepreneurship

Moderator: Ying Zhao, PhD

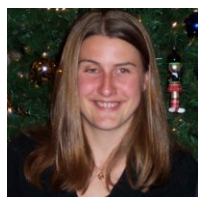
Panelists

James R. Hauske, PhD, *President & Founder*, Sensor Pharmaceuticals



Dr. James R. Hauske is the President and Founder of Sensor Pharmaceuticals Inc., a company focused on discovering orally delivered, gut-restricted entities, recognizing gut-expressed molecular targets. He started his career at Pfizer in Groton, Connecticut where he contributed IP, IND's and mentored incoming scientists for 15 years. After his Pfizer tenure, Dr. Hauske spent 8.5 years helping to build Sepracor, Inc. in Marlboro Massachusetts, as Senior Vice-President of Drug Discovery and Drug Development reporting directly to the CEO. He was a member of the executive management team and also had Board of Director responsibilities. After Jim's Sepracor experience, he started his first company, PsyCheNomicS, Inc. a company directed toward the discovery of molecules suitable for the treatment of neuropsychological disorders, which later was sold for cash and stock to Novasite, Inc. A portion of the technology of this company was combined with a series of lead structures to form Ampla Pharmaceuticals, Inc., where Jim served as the President and Co-Founder. During his 25 years in the pharmaceutical industry, Dr. Hauske has patented close to 75 patents, which are the basis of formation of a couple companies, such as Prexa Pharmaceuticals. He also has published 50 research articles in a variety of prominent journals.

Ewa Lis, PhD, *CTO & Founder*, Koliber Biosciences



Ewa is currently Chief Technology Officer of Koliber Biosciences, a biotechnology company developing novel probiotics for consumer health applications. Ewa has a broad skill set spanning multiple areas of biology, chemistry and machine learning. She specializes in microbial metabolic engineering and synthetic biology tool development. Before founding Koliber, Ewa led several projects at Genomatica, a renewable chemicals company. She contributed to key IP in the area of feedstock utilization which lead to improved economics of 1,4-butanediol production. While at Life Technologies, Ewa established an algae program, helped design a state-of-the-art algae manufacturing facility and delivered first to market genetic engineering kits for two strains of algae. Prior to Life Technologies, Ewa led a team of postdoctoral researchers at University of California, San Diego on a Sponsored Research Project from Biolight Harvesting where she discovered and scaled up cyanobacterial strains for fatty acid production. Ewa holds a BA in Chemistry from Cornell University (2002) and a Ph.D. in Biological Sciences from The Scripps Research Institute (2008).

Giovanna Iaffaldano, MPA, BBA, Sr. Assistant Director, Rady School of Management UC San Diego



Giovanna is a seasoned professional with extensive experience managing admission and enrollment functions, sales, project management, and implementing programs and marketing initiatives in university settings. Her career in higher education centered around educational student loan financing and products and in enrollment management at the graduate and professional level. Prior to joining Rady School of Management, she was Associate Director at the University of San Diego School of Law for twelve years.

Giovanna holds an MPA in Government Relations and BBA in Sales and Marketing. She recently completed a Peace and Global Education, Graduate degree program at the University of San Diego.

Jiwu Wang, PhD, Founder, President & CEO, Allele Biotechnology & Pharmaceuticals, Scintillon Institute



Dr. Jiwu Wang received his undergraduate degree in Biochemistry from Peking University and Ph.D. in molecular biology from USC. He worked in the RNA-related fields in graduate school and as a postdoc at UCSD. After postdoc training he founded Allele Biotechnology & Pharmaceuticals in 1999. He built a highly-distinguished research team at Allele that has made significant contributions to nano antibodies, fluorescent protein markers, and induced pluripotent stem cells. Allele has developed its own protocols to generate pancreatic beta cells, oligodendrocytes, hepatocytes, cardiomyocytes, etc., and initiated programs aimed at cell therapy trials. Several nano antibody drug candidates against cancer targets are at the in vivo efficacy stage. Dr. Wang also founded non-profit Scintillon Institute and serves as its president. The institute has about 10 faculty members working on cytometry, translational research in various disease areas, particularly in neural degenerative diseases.

Panel Summary

- All panelists come from an academic background with a PhD degree in science except Giovanna. James holds a PhD in organic chemistry, Ewa and Jiwu's PhD training were focused on biology. Giovanna holds a MPA in Government Relations and BBA in Sales and Marketing. Ewa transitioned into industry directly after finishing her graduate school, while both Jiwu and James received postdoc trainings before they started their career in industry.

- All the panelists appreciate their trainings as PhD graduates as well as postdocs. They emphasize the importance of working hard and completing your project well. James pointed out that one should work hard and harder to prepare themselves for whatever they want for their future career. Ewa covered the topic on how to deal with difficult people. She suggested the audience take every opportunity to learn it now in school before switching to industry. James encouraged junior students to find out what kind of career he'd like to pursue. It should be something one has enthusiastic and motivation. If the current position is not bringing you anywhere, do not hesitate to change.
- Networking is critical for newly graduated students or postdocs, to get their foot into the door of industry. The panelists shared their networking stories with the audience. Ewa got her first job through faculties on her thesis committee. Her defense presentation was actually her job interview. Jiwu started his career in Allele Biotechnology by helping his friends to write a grant for the company, because he is a great grant writer. Now most employees in his company were hired through reference. However, he did point out there is still chance that you would get a job through an online application channel as long as you have a good track record showing your productivity and capability. Giovanna mentioned that one reason people pursued an MBA at Rady, is to expand their network.
- The panelists also recommend the audience understand the importance of and resources for money and funding if they want to start their own business.

Panel 10

Intellectual Property, Tech Transfer & Science Policy

Moderator: Stefanie Makowski, PhD

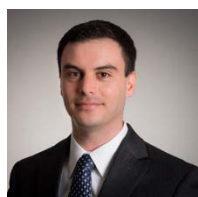
Panelists

Shannon Muir, PhD, *former Senior Program Associate, California Council on Science & Technology (CCST); current Strategic Research Opportunities Analyst, UCSD Research Proposal Development Service*



Dr. Shannon Muir is a Senior Program Associate at CCST, where she staffs the Federally Funded Laboratory Affiliates program, supports fundraising efforts, and develops strategies for internal and external CCST projects. Shannon was CCST Science Policy Fellow in 2015, and she served as a consultant for the California Senate Committee on Health, analyzing legislation including electronic cigarettes, internet prescribing, health insurance, and aging and long term care. Prior to her Fellowship, Shannon earned her PhD in Biomedical Sciences from UC San Diego studying pediatric cancer genetics. During her time at UC San Diego, she served as Legislative Liaison for Local & State Affairs for the UC San Diego Graduate Student Association and Chair of the Graduate and Professional Student Committee on the UC Student Association Board of Directors and also represented graduate students on the UC Academic Senate Committee on Research Policy. For her work, she was awarded the UC Student Association's Advocate of the Year Award in 2012. Shannon holds an MS in Pharmacology from Tulane University School of Medicine and a BS in Psychobiology from UCLA.

Aaron Parker, PhD, JD, *Associate, Morrison & Foerster*



Dr. Aaron Parker is an associate in the San Diego office of Morrison & Foerster whose practice focuses on prosecution of U.S. and international patent applications in biotechnology, pharmaceutical, and other life sciences industries. He periodically assists in patent litigation and diligence matters. He works with clients in a number of areas, including antibodies, cell therapy, biologics, small molecules, and stem cells.

Aaron received his J.D. with honors from the University of Texas School of Law, where he served as the technology editor for the Texas Intellectual Property Law Journal. He received a B.S. in microbiology and a Ph.D. in biology from the University of California, San Diego, performing doctoral research in the laboratory of Professor Inder M. Verma at the Salk Institute for Biological Studies on the generation of hematopoietic cells from human embryonic and induced pluripotent stem cells. Prior to graduate school, he worked in the intellectual property department of Diversa Corporation and conducted neuroscience research at a privately held biotechnology company.

Skip Cynar, PhD, *Senior Licensing Officer, UCSD Office of Innovation & Commercialization*



Beginning his 9th year at UC San Diego's Office of Innovation & Commercialization, Dr. Skip Cynar is a senior licensing officer and manages a portfolio of inventions and copyrights from physics, engineering, chemistry, and medicine. Prior to returning to UCSD, Skip enjoyed a career in publishing, targeting the needs of students, educators, and researchers in science and technology. Skip received a PhD from UCSD and recently has become certified as an Educator for Lean Launchpad, a pedagogy to teach scientists how to turn their discoveries into entrepreneurial, job-producing businesses.

Paul Roben, PhD, *Associate Vice Chancellor for Innovation & Commercialization, UCSD Office of Innovation & Commercialization*



Paul Roben, Ph.D., was named Associate Vice Chancellor for Innovation and Commercialization at UC San Diego in June 2015. Working with the Vice Chancellor for Research, AVC Roben has transformed the functions of the Technology Transfer Office, Industry Research Alliances, and Industry Contracting into an integrated organization. He oversees the Office of Innovation and Commercialization (OIC), with a mission to accelerate the commercialization of UC San Diego innovations and contribute to a sustainable society, by empowering a diverse entrepreneurial culture on campus, and strengthening a dynamic regional innovation ecosystem. Under his leadership, OIC has taken a collaborative approach, working with campus and community partners to launch new initiatives and enhance the existing ecosystem by identifying underserved innovation and entrepreneurship needs. Previously he was Senior Director of Office Technology Development at the Salk Institute in La Jolla, working with multiple academic institutes to develop strategic processes to drive innovation alliances, and help translate their research programs into products for patients and society. He guided the formation of multiple new start-up companies and was responsible for the negotiation of a broad spectrum of technology licenses to industry. As a key member of Ireland's Innovation Taskforce (2009 to present), he co-authored a national economic-development plan for Ireland, among other achievements. He earned a Bachelor of Science degree in Biotechnology, as well as his Ph.D., at Dublin City University in Ireland, and studied as a Postdoctoral Fellow with Dr. Greg Silverman at UC San Diego.

Nishal Mohan, PhD, *National Community Leader, US Ignite*



Dr. Nishal Mohan is the National Community Leader for US Ignite and responsible for implementation of the Smart Gigabit Communities initiative. Nishal joined US Ignite after serving as an AAAS Science & Technology Policy Fellow in the Office of the Assistant Director, Directorate for Computer and Information Science and Engineering at the National Science Foundation (NSF). He was responsible for developing and driving national initiatives in Big Data and data science,

smart and connected health, smart cities and next generation internet and applications through the NSF US Ignite program. Previously, he served as the Director of biology policy for the Federation of American Scientists and Acting Director of Scientists and Engineers for America Action Fund. He also founded and served on the board of directors as the Executive Director of the international multi-organizational Virtual Biosecurity Center and founded Pandemic Academic, for emerging technology solutions to global infectious diseases. Nishal received his B.S. in biology at CUNY Hunter College and his Ph.D. in molecular biology at Princeton University.

Panel Summary

Path from Ph.D. to current job:

NM: After obtaining his Ph.D. in molecular biology working with viruses, Nishal moved to DC to work for an NGO called the Federation of American Scientists in the bioweapons non-proliferation field. He also had the opportunity to start an international biosecurity center with the UN and 30 other partners to prevent global biological weapons proliferation. After starting a small company focused on web development and search engine optimization to learn about running a business, he became an AAAS Science & Technology Policy Fellow in the Office of the Assistant Director, Directorate for Computer and Information Science and Engineering at the National Science Foundation (NSF). Through the NSF US Ignite program, he worked on data science policy, smart and connected health, and next generation applications and services in national priority areas such as health, transportation, and energy. He is currently working with an NGO also called US Ignite, focused on building innovation ecosystems in 21 different cities across the US and Australia, using next-generation applications and services to enrich people's lives.

PR: Paul started as a grad student at Scripps, and then went on to become a postdoc at UCSD. He worked at a few small biotech companies before joining a friend to start their own company using funds gathered from family, friends, and venture capital. He then went to work in the Irish government, promoting the development of ideas starting in research into startup companies and helping to write Ireland's national economic development plan. He returned to San Diego, first at Salk and now at UCSD, where his job is to ensure that resources, funding and people across the university are coordinated and structured to help achieve the Chancellor's economic engagement policy. This entails building the innovation ecosystem in the San Diego and Tijuana/Ensenada region, including startups, education, and stimulating entrepreneurship on campus.

SC: Skip describes his career as accidental. He earned his Ph.D. at UCSD and had a postdoc lined up in Santa Barbara but turned it down for family reasons. Looking for opportunities in San Diego, he tried working as an adjunct professor at USD, got into publishing with Academic Press (later purchased by Elsevier), and eventually came back to UCSD as a senior writer for the Medical School. Working on a book on patents and IP peaked his interest in the field, so he

earned a certificate in IP through UCSD Extension. Currently he is a Senior Licensing Officer at the UCSD Office of Innovation & Commercialization. Last year, his group was responsible for about 100 licenses and 19 startups.

AP: Aaron is a patent attorney at Morrison & Foerster. While an undergrad at UCSD, he took a 1-unit course about alternative careers in biotech where one speaker, the VP of IP at Diversa Corp, sparked his interest. Most of his day is spent writing patent applications for clients that may have an invention (one must love writing to do this job). He also does prosecution of patent applications, which involves both technical and legal negotiation with the patent office about why a client is entitled to a patent, for example. He has also done patent litigation support. For instance, this might involve translating technical information to an expert who aims to convince jurors (who may not have science backgrounds) regarding a particular case.

SM: As a grad student in the UCSD Biomedical Sciences program, she became interested in science policy after listening to a speaker at a retreat, a former head of the Women's Health Division at the FDA forced to resign over controversy over Plan B. She then got involved with the UCSD Grad Student Association (GSA), first as a representative for her program and then as the legislative liaison for local and state affairs. Thus, she was also on the Board of Directors for the UC Student Association, which allowed her to lobby on behalf of grad students and higher education as well as interact with students and city and state officials across CA. She became a fellow at the California Council on Science & Technology (CCST), where she was placed on the Senate Committee on Health and became involved with issues such as electronic cigarettes and women's health. Later, she became a Senior Program Associate at CCST, where she wore many hats, including fundraising. Currently she is at the UCSD Office of Research Affairs with the limited submissions team to help PIs obtain funding.

Advice on the post Ph.D. transition, useful skills:

SM: If you are interested in science policy, it should be something you have a legitimate interest in. To break into it, get involved with a particular political party or interest group. Try to gain leadership, communication, and negotiation skills by working your way into their leadership and learning how the organization works. For her job, an important skill she also had to learn was how to chair meetings effectively and efficiently.

AP: Learn how to write if you want to get into the patent field. Working on scientific manuscripts can help, but note that writing for scientists (often filled with jargon) is very different than writing for lay people (write as if for the NY Times or The Economist). He recommends becoming a patent agent first before becoming a patent attorney. Though not a lawyer, the patent agent takes a test in order to become certified and then can represent clients in front of the patent office. Firms will often pay you to train to be a patent agent, which allows you to get a year or two of experience to learn the field on someone else's dime before devoting time and money to

law school. It is also more forgiving to make mistakes as a patent agent, as opposed to a patent attorney, whose pay rates are much higher. He also recommends reading the book, “If You Build It Will They Come?” Besides networking, other advice includes working on business development skills (sales), becoming a generalist (as opposed to the specialist you become in your Ph.D.), and including an IP section in your resume for job applications describing classes you’ve taken or how far along you are in the patent bar, which helps show your interest in the field.

SC: Writing is important. Start by analyzing press releases from UCSD or your department. Check out events from the Office of Innovation & Commercialization (sign up for the email list at <http://innovation.ucsd.edu/about/subscribe/>), as these are great opportunities to talk to people in these fields. Also take advantage of Extension classes to help identify your interests.

PR: Trying to build innovation ecosystems at the intersection of the private sector, public sector and government means it is important to know a little about a lot of things. Try to have a background with diverse experiences from a lot of different places. For example, he had a lot of experience with startups, but realized that working for big pharma would have been helpful for his current position. If you are interested in getting into a company, try doing an internship. He stresses that networking is critically important, as well as an advanced degree (in his case, a Ph.D., but not an MBA). Also, consider entrepreneurship as a way to create your own job. Keep in mind that the acid test for judging whether you have a good idea is by considering the commercial aspect, specifically asking whether anybody cares or would buy the product. Soft skills are also important, as you will likely have to learn how to influence people in whatever you do. This includes being a leader and knowing how to build teams, build consensus and communicate your story. Read books and take Extension courses. For the entrepreneurial aspect of his job, taking risks is important as well as being comfortable outside your comfort zone.

NM: It is important to communicate at multiple levels, from someone in Congress without a science background to researchers in academia. Be open-minded, because thinking that you know everything can be harmful for your career. Network and hustle, taking advantage of opportunities that may present themselves. In his case, he went to the NGO website and learned about the organizations he was most interested in by reading their papers, contacting people within the organization, and attending meetings where you can network with them. Another route involves getting a fellowship with AAAS or Mirzayan, which gives you many opportunities to learn policy while also affecting it. For example, while at NSF, Nishal learned a lot about big data and data science while being able to influence the policy, despite having a biology background. Have high emotional intelligence, including listening to people and understanding and affecting negotiations. To better chair meetings and understand organizations, volunteer to take meeting notes. Also, he recommends learning how to code.