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mitting an abstract to share your experiences in our special session. Topic areas of interest include experience and updates on advances in health and safety practices handling of nanomaterials in radiation-related settings, including sensors, materials science, and nano-enabled methods and processes. Some of the fastest-growing applications of nanotechnology, including radiolabeled materials for diagnosis and treatment, are occurring in the medical sciences, and we hope a number of you will have information to share on that topic. Please help us plan a session that will be useful to you and your organization. You can send your nano-related experiences, questions, and suggestions for activities for our HPS Nanotechnology Committee to us at any time (mhoover1@cdc.gov and day@lsu.edu).

Student Corner

"Internal Dosimetry Is Multidisciplinary, Challenging, and Exciting" An Interview With John Klumpp, PhD Los Alamos National Laboratory

Deepesh Poudel, Los Alamos National Laboratory

John Klumpp
Submitted photo

To give our student readers a good picture of what it is like to work in various types of organizations and possibly aid them in choosing a career that's a good fit for them, we have introduced a new series in this section of the newsletter. We will be chatting with young professionals working in different settings—national laboratories, academia, hospitals, and industries—about their background, their responsibilities, what they like about working for their employer, and what suggestions they have for students aspiring to a similar career. In the first installment of the series, I talked to John Klumpp of Radiation Protection Services Group at Los Alamos National Laboratory about his experiences.

Give us a little information about your background and how you became involved in health physics.

Klumpp: After completing my bachelor's degree in physics from Bates College, I moved on to the University of Pennsylvania, where I got a master's degree in medical physics. I then got a job running an animal-imaging lab at the Children's Hospital of Philadelphia (CHOP), where I wound up working closely with the hospital's health physicists. My job at CHOP was basically to facilitate other people's research projects, which was fun, but after a few years, I started wanting to do my own research.

This eventually led me to the health physics doctoral program at Colorado State University (CSU). Initially I had planned to study medical physics at CSU, but by good luck (as it turned out) I became immersed in an incredibly interesting health physics research project. This project involved developing Bayesian algorithms for detecting radionuclides, which combined my interests in physics, statistics, and computer science. My advisor, Alex Brandl, chose to put a lot of faith in me and indulged my wish to take graduate-level classes in statistics and machine learning. These paid off and led to (I think) a pretty good dissertation.

The head of the health physics department at CSU, Tom Johnson, noticed that my interests coincided with those of Guthrie Miller, who was one of the pioneers in applying Bayesian statistics to internal dosimetry at Los Alamos National Lab. He arranged for us to meet in Los Alamos, and we hit it off right away, eventually coauthoring a paper that formed a significant part of my dissertation. That partnership ultimately led to a job in internal dosimetry at Los Alamos.

What does your job consist of?

Klumpp: My main responsibility is to analyze employees' bioassay data as part of our radionuclide intake-monitoring program. If a routine sample looks concerning, or if there's some kind of incident, we ask for more samples until we can confidently say whether or not the employee had an intake.

Los Alamos National Laboratory does a very good job of keeping its employees safe, so this doesn't usually take up a lot of time. When things are going well, I spend a good deal of my time working on ways to improve the program. For example, I am also responsible for maintaining and improving our dose-assessment software, which interprets bioassay data using a sophisticated Markov Chain Monte Carlo algorithm. Also, the vast majority of the intakes we detect are extremely small, but we have found that reporting them can sometimes be very upsetting to the worker. So we are in the process of overhauling the way we communicate our results to workers.

When I'm not doing one of those things, I'm working on research. I'm currently involved in about a half dozen (give or take) different research projects, including projects on chelation and aerosol deposition in the respiratory tract.

What do you enjoy the most about what you do?

Klumpp: The best part of my job is undoubtedly the people I work with. We're always in each other's offices exchanging ideas, which makes for a fertile intellectual environment. More than that, we're very fortunate to get along personally, so when we're not talking science, we're talking about family, current events, sports, etc. These people are North America's leading experts in the field, but you would never know it from how open and humble they are.

As for what I actually do, what I enjoy most is being able to apply my talents and creativity in a way that actually helps people. If I have a brainstorm about how we can protect our employees better, I can then take my ideas to my colleagues and managers and we can put those ideas into practice. That's happened several times in the two years I've been here.

What do you like the most about working for a national laboratory?

Klumpp: What I like best about working for Los Alamos National Laboratory is that conducting original research is part of my job description, but the research is done for a purpose. Handling routine bioassay monitoring is not a great way to prepare for an emergency. You really need to be up to date in your field in order to do original research, so publishing your research in peer-reviewed journals is the best way to demonstrate that we are prepared should something unexpected happen. Also, being responsible for the bioassay monitoring program gives us a lot of insight into whether or not a particular line of research will have practical value in the field, which is an advantage a lot of people in academia may not have.

Finally, what advice do you have for students thinking of a similar career?

Klumpp: There are so many opportunities for research and so few new internal dosimetrists being produced that this is a really good field for aspiring scientists. One thing I would say is that internal dosimetry is really a multidisciplinary field, so it's not enough to be an expert in just health physics. To begin with, you really need to learn computer programming. But beyond that you could make yourself invaluable by combining health physics expertise with expertise in almost any other field, be it computer science, mathematics, statistics, chemistry, biology, medicine, psychology, or something else. What's exciting is that there are so many different ways to contribute.

If you'd like to share your own experiences in the *Health Physics News* Student Corner, please email Deepesh Poudel (dpoudel@lanl.gov).