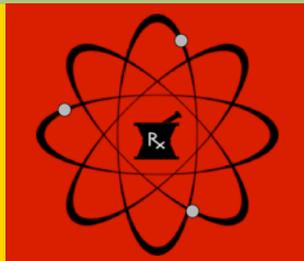


# The Nuclear Monthly Missive



Brought to you by the New Practitioners Committee

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## Passionate and Published

Pubmedable (puhb-MEHD-uh-buhl) *adjective*: discoverable in the NLM's databank of peer-reviewed papers. *After years of agonizing over all of the data and writing the manuscript, Jeff's work was accepted for publication, making him instantly Pubmedable.*



So maybe it's not *really* a word, but it is one that readily describes Jeff Norenberg, and one that I hope will someday describe me. Dr. Norenberg is a professor at the University of New Mexico and is the Director for the University's

Small-Animal Imaging Center. In this research facility, he and his colleagues work with pharmaceutical companies in the development of novel therapeutic drug molecules, and help determine prognostic markers, drug targets, and the drug's action. They can do this by using either a radiolabeled surrogate of the company's drug or by using a drug that is already available (like FDG) that can characterize the tissue response to a drug. The information obtained from these pre-clinical efforts can help major pharmaceutical companies decide whether or not to continue with human trials.

The facility also has a few of their own research ventures, including several patents for leukocyte function-associated antigen 1 (LFA-1) targeted

### Did you know...

Did you know that Dr. John Christian developed the first radiopharmaceutical monographs for the USP?

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molecules. Here's the scoop. LFA-1 is an important signal early in inflammation and in immune cell activation, and it sends a signal that recruits other leukocytes to the area. Through his research, Dr. Norenberg has been able to show that this tiny molecule has very unique targeting properties in certain disease states such as atherosclerosis, IBD, and other immune-mediated diseases. And because it has these unique properties, we may see LFA-1 used as an alternative for white blood cell tagging someday.

Jeff tells me that "research is fun, especially when students are involved." Because he is at UNM, he works with students of differing backgrounds, including pharmacy, engineering, medical, and cell biology. It comes as no surprise when Dr. Norenberg says that what he enjoys the most about his job is the variety it offers, and the new challenges it always brings. When he is not in the lab, you might find him teaching pharmacy courses such as evaluating drug literature, pharmacotherapy, and medical imaging, and teaching graduate students how to conduct

"Research is fun, especially when students are involved."



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Suggestions for next month's newsletter? Contact Ashley Mishoe at [AshleyMishoe@me.com](mailto:AshleyMishoe@me.com).

clinical research. And when he's not in a classroom, you might find him gathering data and reporting to a third-party sponsor, or writing manuscripts, or traveling to present their latest findings and receive feedback. He informs me that seeking feedback is critical in research, adding that "feedback is the breakfast of champions." Sounds delicious.

Jeff didn't start his career in pharmacy, but rather, in biology. In October 1986, after finishing a BS in biology and starting a graduate program in marine biology, he stumbled upon an article on targeted drug therapy that peaked his interest. He then decided pharmacy may be a more viable career option, and he researched to find the pharmacy school with the cheapest tuition and the fastest admission process. In January 1987, he started pharmacy school at UNM and graduated 2 years later with his BS in pharmacy. (That is fast!)



He knew during pharmacy school that he still wanted to pursue the idea of targeted drug therapy, so he continued his education with a nuclear pharmacy residency, and earned a Masters in Pharmaceutical Sciences from UNM. From there, Dr. Norenberg worked as a clinical nuclear pharmacist at Tufts University in Boston. Although he enjoyed working in a large nuclear medicine department and training radiology residents and fellows, he still desired to get back to true research, and in 1994, he was recruited to come back to UNM, where he was engaged in both teaching and research. Several years later, when PharmD

programs were becoming more prevalent, Jeff opted to further his pharmacy knowledge by completing a post-baccalaureate Doctor of Pharmacy degree at the University of Washington. This program offered broad training in the application of pharmacotherapy, and included more hands-on clinical experiences. What was it like going back? Jeff said, "like doing another intense residency."

But wait, there's more! Although he has been actively involved in research for quite some time now, he decided to continue his education even

further with a PhD in pharmacology. From where? Erasmus University in the Netherlands. Kind of takes the concept of distance education to a whole new level. Surely there's a background story to him picking this school, right? Of course. In 1998, he began working with UNM and Malinkrodt in the first phase 1 study of Y-90-labelled DOTATOC as a targeted therapy for neuroendocrine

tumors. During this research, he presented results in Rotterdam every quarter at the Erasmus University Medical Center, and began collaborating with other researchers at Erasmus on somatostatin receptor targeting. Because he was there so often and had been interfacing with the University so much, he began working towards a PhD at their facility. Unlike most PhD programs in the US that have a set course schedule, the European system considers your entire CV, including your previous publications and your current research, when determining your progression towards the degree. Although he's not

### GET. THE. APP.

Woo-hoo! The APhA 2013 Annual Meeting and Exposition app is now available in the App Store and Android Market! If you haven't used it before, it is amazing and quite helpful when trying to juggle a packed agenda.

#### Use it to:

- Browse all session info
- Create your own schedule
- Connect with friends using the Friend feature
- Take notes during sessions
- Follow the meeting's Twitter feed (#APhA2013)
- Peruse the local hot spots with the Local Places feature



quite finished, he is expected to complete this degree in May 2013.

In addition to his research endeavors at UNM and Erasmus, Dr. Norenberg stays actively involved in the advancement of nuclear pharmacy through his roles as the Executive Director of

the National Association of Nuclear Pharmacies (NANP) and as a board member for the Society of Nuclear Medicine and Molecular Imaging (SNMMI). Through NANP, a trade association for nuclear pharmacies, he keeps abreast of current policy initiatives by attending meetings held by the Mo-99 stakeholders, the Office of Science and Technology,

trade associations, and by the National Nuclear Security Administration. Additionally, in his work with SNMMI, he meets with the board quarterly to determine best practices for radiopharmaceutical compounding and the clinical use of these agents.

“Find something you’re passion about and pursue it with vigor.”

With all of the research and traveling he does, I found myself wondering if he has *any* time to do anything fun outside of pharmacy, and I was almost afraid to ask. Fortunately, he does. Jeff enjoys bike riding... a lot of bike riding. As in 10,000 miles a year of bike riding. He has completed [Cycle Oregon](#) and hopes to complete [Cycle Greater Yellow Stone](#) this year. Considering these courses are nearly 500 miles each, I think that is quite impressive!

After hearing about all of his research and his jet-setting around the globe to attend nuclear meetings, I was anxious to not only hear his thoughts on the future of nuclear pharmacy, but also to catch his advice to students and new practitioners. Dr. Norenberg tells me that “people in nuclear pharmacy are innovative and creative,” and because of this, we could see more targeted therapeutics and diagnostics, and possibly even stem cell therapeutics in our future. As exciting as it is to publish papers and book chapters, he tells me he gets more satisfaction out of seeing students becoming successful and making the next step in their careers. He encourages students and new practitioners to keep an eye open for opportunities that will excite you, and he pushes us to “find something you’re passionate about and pursue it with vigor.” It’s obvious that’s what Jeff did. He is passionate, he is published, and he is definitely Pubmedable.

Until next time,

Ashley Mishoe

### Upcoming Events:

**March 1-4, 2013**

APhA Annual Meeting & Exposition  
Los Angeles, CA

#### Friday, March 1

- Outsource Validation for Nuclear Pharmacies

#### Saturday, March 2

- Mapping the Trajectory of Dementia and Parkinson’s Disease with Imaging
- Joint NANP and APhA-APPM Nuclear Pharmacists Reception

#### Sunday, March 3

- Nuclear Pharmacists Breakfast and Business Meeting
- New Radiopharmaceuticals on the Horizon
- Radiation Exposure Issues and ALARA

#### Monday, March 4

- Molecular Imaging in Clinical Practice