Profile of Researcher

Carolyn J. Anderson, PhD

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Carolyn J. Anderson has had an unlikely journey towards a career in diagnostic imaging and targeted radionuclide cancer therapy; one that started with undergraduate training in nuclear chemistry. Coming from a large family in Northern Wisconsin with limited resources, she did her undergraduate education in Chemistry at a small branch school of the University of Wisconsin (Superior). During her junior year of college (1984), she applied, on a whim, to be in the first elite class of students in the Summer School in Nuclear Chemistry at San Jose State University, funded by the Department of Energy. Unexpectedly accepted, she became part of a group of chemistry majors, from colleges such as Harvard and UC-Berkeley, taking coursework and learning laboratory skills in nuclear chemistry; an area where there is still minimal formal didactic training at the undergraduate level. There, she met Professor Greg Choppin and went on to do her PhD training with him at Florida State University, studying the behavior of actinides in the environment. The summer before starting graduate school, she learned about nuclear medicine through a summer program at Argonne National Lab and discovered a passion for applying nuclear chemistry to medicine. After receiving her PhD in Inorganic Chemistry, she went to Washington University in St. Louis to do postdoctoral research with Professor Michael J. Welch, and there she designed and studied receptor-targeted agents labeled with metal radionuclides for imaging and therapy of cancer. More than 20 years later, as a full Professor, she left Washington University and now leads pre-clinical cancer imaging at the University of Pittsburgh.

Dr. Anderson's research throughout the past 28 years has laid a foundation for the recent exploding growth of radiometal-based agents for diagnostic imaging and targeted radionuclide therapy of cancer, a field now coined "theranostics". Her lab has done seminal research on the development of copper-64-labeled antibodies and peptides for positron emission tomography (PET) imaging of cancer, and she and colleagues at Washington University led the first human study of a copper-64-labeled somatostatin analog to image neuroendocrine tumors. The first commercial copper-64-labeled agent in this class is now moving towards FDA approval and commercialization (Cu-64 DOTATATE). Nearly 20 years ago, her lab published pre-clinical toxicity of the ^{177}Lu-labeled version of DOTATATE; that agent is now FDA-approved and commercially available for treating neuroendocrine tumors. Dr. Anderson has unique expertise, applying her training in inorganic chemistry and radiochemistry to design chelators for stably complexing radiometals to cancer receptor-targeted agents, and she was funded for 12 years by NIH in this area. At the University of Pittsburgh, Dr. Anderson's lab develops radiometal-based agents to image specific cell types in the immune system for early response assessment of immune-based therapies. Collaborating with outstanding clinician scientists, such as John Kirkwood (Director of Melanoma Program) and Robert Ferris (Director of the UPMC Hillman Cancer Center), her lab is funded to design PET agents for imaging

immune checkpoint pathways and to explore combining immunotherapy with novel targeted radionuclide therapy agents.

Dr. Anderson has received numerous honors, including the Michael J. Welch Award from the Society of Nuclear Medicine and Molecular Imaging in 2012, and a Distinguished Investigator Award from the Academy of Radiology Research in 2014. She gave the Michael J. Welch Lecture at Washington University (2015) and the Patricia Durbin Lecture at Lawrence Berkeley National Lab (2016).