

Direct Prompt Synthesis of Radioactive Nanoparticles (Prompt Nano Radioisotopes)

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Abstract: Most nanomedicines use nanostructures as carrier for drugs, making their therapeutic effectiveness dependent on the ability to deliver the drug to the interior of cells (endocytosis). Nano Radioisotopes do NOT require endocytosis, since approaching the cell from the outside (targeting or retention) can be sufficient to kill the cell (i.e. induce apoptosis). In this case, the therapeutic load is radiating energy with sufficient penetration into nearby cells. Radiation methods for the creation of nanostructures also have various advantages over chemical ones. First, the reductive potential induced by radiation is essential instantaneous and uniform throughout the precursor solutions. Finally, the reducing agent is radiation, ameliorating potential contamination issues. Most radioactive nanostructures (non-prompt) are produced by activating precursor elements and then performing radiochemical procedures to make nanostructured forms. Prompt Nano-Radioisotopes make radioactive isotopes in nano form ready to use, reducing the need for facilities to manipulate radiochemicals or radiopharmaceuticals.

About the speaker: Prof. Carlos Henry Castaño Giraldo was born in Colombia, South America, and naturalized in the US in 2016. He received his BS degree as a chemical engineer with a minor in electrochemistry in 1998 from the National University of Colombia in Medellin. He obtained his MS (2003) and his PhD (2006) degrees in Nuclear Engineering from the University of Illinois at Urbana-Champaign. His MS thesis was on superconductivity properties of specially prepared palladium hydride samples and his PhD dissertation was on the study of breakdown on RF antennas for fusion applications. He worked as a postdoctoral research associate at the Center for Plasma-Material Interactions working in subjects related to semiconductor micro-fabrication and extreme ultraviolet generation using plasmas. Currently, Carlos an associate professor of nuclear engineering at the Missouri University of Science and Technology (Missouri S&T). He has published 57 papers, and conference papers in peer reviewed professional journals, 7 book chapters, and holds one US patent. His Scopus H-index is 16. He is also a member of the Alpha Nu Sigma Honor Society for nuclear engineers.

**Chemistry
Seminar on
the synthesis of
radioactive
nanoparticle**

**Monday
Oct. 2 at 4 pm
in 303
Schrenk**

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