**Chemistry for Development of Theranostic Radiopharmaceuticals**, Symposium #11

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This symposium will cover all aspects of the chemistry associated with development of theranostic radiopharmaceuticals. Theranostics radiopharmaceuticals have combined capability of diagnostic imaging and radionuclide treatment in a single agent. By combining imaging with therapy, treatments can be tailored to a specific patient. Patient-specific treatments can be more effective than broadly applied therapeutics, as they focus on the pharmacology relative to that patient and characteristics of his/her disease. In the simplest form, a theranostic radiopharmaceutical may contain a disease-targeting agent coupled with a single radionuclide that has emissions for both imaging and therapy. However, in more sophisticated forms, a theranostic radiopharmaceutical may be multifunctional and multimodal in nature. Multifunctional theranostic agents can have chemical moieties that: (a) target diseased tissue, (b) provide imaging capabilities (radioactive and/or photonics or contrast) to determine disease targeting, pharmacokinetics and biodistribution, and (c) deliver particle-emitting radionuclides for therapy, alone or in combination with chemotherapy agents. The symposium will highlight advances made in; (1) theranostic radionuclide preparation/purification; (2) chemistry of developing multifunctional disease-targeting scaffolds, (3) chemistry of conjugating radionuclide chelating or bonding agents; (4) chemistry of radiolabeling the theranostic agents; and (5) use of biological testing in development of theranostic radiopharmaceuticals.