

Wednesday, July 16th, 2014

LSC 3 - Life Sciences Centre

2350 Health Sciences Mall

12-1pm



## Dr. Rainer Haag

*Chair Professor of Organic and Macromolecular  
Chemistry*

*Department of Chemistry and Biochemistry,  
Freie Universität Berlin*

### **“Multivalent Dendritic Polyglycerol Sulfates as highly anti-inflammatory and antiviral drugs”**

Application of polymer therapeutics in medicine is a rapidly moving field that is gaining fast acceptance and recognition as an independent area of research and scientific endeavor. The combination of a high density of endgroups and a compact well defined molecule structure makes dendritic architectures attractive for biomedical applications. The synergy between their multivalency and size in nanoscale provides a range of options for chemical “smartness” along their molecular scaffold to achieve environment sensitive modalities.

Due to their low degree of molecular weight dispersity, flexible design, and biocompatible nature, dendritic polyglycerols (PGs) have a broad range of potential applications in medicine and pharmacology. The versatility of the polyglycerol scaffold for application in the biomedical field has been recently reviewed.

Most recently, our group demonstrated that polyanionic, dendritic polyglycerol sulfates (dPGS) exert strong binding affinity to cellular targets involved in the inflammatory process by inhibiting leucocyte infiltration *in vivo*.<sup>7</sup> We have further demonstrated that dPGS acts as a novel type of synthetic nanocarrier suited for inflammation-specific molecular imaging. Translation into the diagnostic application was accomplished by *in vivo* fluorescence imaging in a rat rheumatoid arthritis model, demonstrating fast and highly selective targeting of tissue inflammation.<sup>8</sup> In a recent study we compared the diagnostic potential of a NIR-dye-labeled system and the therapeutic efficacy of dPGS in RA.