

## BIONAND 2018 CONFERENCE SERIES

### Precision Drug Delivery Systems based on Dendritic Bis-MPA Polyesters

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#### Abstract:

The family of dendritic polymers includes polydisperse hyperbranched and dendronized polymers as well as monodisperse dendrons and dendrimers. The latter have been dominating the field of biomedical applications which is strongly related to their unique features e.g. layered branched structure, large and exact number of functional groups and extraordinary structural perfection with unprecedented structure-to-property relationship. Recent advancements in robust chemistries has increased the interest for linear-dendritic (LD) block copolymers that amalgamate the properties of linear and dendritic components into new hybrid materials. This presentation will detail advances in synthetic strategies towards novel dendrimers and dendritic-linear block copolymers based on 2,2-bis(methylol)propionic acid (bis-MPA) as a monomer and their assessment as potent nanomedicines.

#### References:

- A. Carlmark, E. Malmström och M. Malkoch, "Dendritic architectures based on bis-MPA : functional polymeric scaffolds for application-driven research," *Chemical Society Reviews*, vol. 42, no. 13, s. 5858-5879, 2013.
- S. Garcia Gallego, A. M. Nyström och M. Malkoch, "Chemistry of multifunctional polymers based on bis-MPA and their cutting-edge applications," *Progress in polymer science*, vol. 48, s. 85-110, 2015.
- S. Garcia Gallego et al., "Fluoride-Promoted Esterification with Imidazolid-Activated Compounds : A Modular and Sustainable Approach to Dendrimers," *Angewandte Chemie International Edition*, vol. 54, no. 8, s. 2416-2419, 2015.
- O. C. J. Andrén, A. P. Fernandes och M. Malkoch, "Heterogeneous Rupturing Dendrimers," *Journal of the American Chemical Society*, 2017.
- O. C. J. Andrén et al., "Therapeutic Nanocarriers via Cholesterol Directed Self-Assembly of Well-Defined Linear-Dendritic Polymeric Amphiphiles," *Chemistry of Materials*, vol. 29, no. 9, s. 3891-3898, 2017.