Speaker: Dr. Jason Thomas Duskey (Targeted Nanomedicines) UNIMORE, FUV

Title: Brain Targeted Nanomedicine: More Than Just Crossing the BBB

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Abstract:

The research of non-invasive therapy for the treatment of neurodegenerative diseases is one of the most important topics in pharmaceutics over recent years. This urgent need for more advanced **Barbara Ruozi** Barrier to allow for early stage diagnosis or successful treatment of these diseases. Nanomedicines, and particularly polymer-based systems have made huge strides in the successful delivery of therapeutic molecules to the brain due to their diversity and the capacity for researchers to modify their characteristics to be more suitable in different biologically relevant environments. This includes modifications such as those that change their structure, size, charge, toxicity, reactivity to blood proteins, and modification with ligands. For brain diseases, attaching ligands capable of crossing the BBB and delivery the payload within the brain is critical, and without these ligands very few clinically applicable systems have hope; however, it is important to remember that successful targeting is not limited to crossing the BBB. Optimizations of the core makeup of a nanoparticle, loading efficiency, proper drug selection, stabilization and longevity of the pharmaco, and blood-protein interactions all play a pivotal role in aiding the effects of the targeting ligands. Without a fully optimized delivery system, the potential of these drug carriers is greatly diminished calling for the continued research into their effects. This talk will highlight numerous other factors in design and optimization that, with targeting ligands, are critical for the advancement of improved nanomedicine delivery systems in their use as clinically relevant therapeutic options.