

SUMMER SEMESTER 2024

RTG 2756 CYTAC SEMINAR SERIES

TUESDAY, APRIL 9  
17:00 IN HS5

CYTAC

RTG 2756

## DR. FLORIAN MANN

Bayer Pharmaceuticals

### “DELIVERING THE MESSAGE”

#### RNA DELIVERY USING LIPID NANOPARTICLES IN AN INDUSTRY SETTING

*Nucleic acid-based drugs have emerged as a promising alternative for the development of potential treatments for a range of diseases previously considered difficult to target. While shorter oligonucleotides, including antisense oligonucleotides (ASO) and small interfering RNAs (siRNA), have gained regulatory approval and market presence for several diseases, the field of mRNA therapeutics gained significant attention during the COVID-19 pandemic with the introduction of mRNA-based vaccines. Currently, several investigational mRNA-based therapies are undergoing clinical evaluation in oncology, vaccines and immunology, protein replacement and genome editing. mRNA offers distinct advantages for various applications within gene therapy, including its potential for transient expression, a critical aspect especially in the context of genome editing. However, its inherent instability and substantial size necessitate its encapsulation within a delivery vehicle to protect it from degradation during transport to target cells and to facilitate efficient cytosolic uptake. To this end, lipid nanoparticles (LNPs) represent by far the most advanced delivery vehicle for mRNA therapeutics, as demonstrated by the two COVID vaccines, the ongoing clinical trials at Intellia and Verve Tx, as well as numerous pre-clinical studies and publications. However, there are still several bottlenecks that need to be overcome in the future to fulfil the promise of RNA therapeutics, such as inefficient endosomal escape, cell-specific delivery to organs beyond the liver, as well as stability and pharmacokinetics. This talk will provide an overview of LNP-mediated RNA therapeutics and the strategies that are being employed in industry to overcome these barriers.*

