

CHEMICAL ENGINEERING
UNIVERSITY of WASHINGTON

GRADUATE SEMINAR SERIES



Nanoparticle Therapeutics: From Concept to Clinic

Dr. Mark Davis

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Monday, January 6, 2020

Reception 3:30-4:00 p.m. | PAA A110

Lecture 4:00-5:00 p.m. | PAA A110

Abstract

We have translated nanoparticles (CRLX-101 and CALAA-01) into the clinic for treating patients with solid cancers. One of these nanoparticle, experimental therapeutics was the first to show functional RNA interference (RNAi) in humans. Lessons learned from these translational and clinical experiences are discussed. Currently, we are concentrating on developing nanoparticles that cross the blood-brain barrier (BBB). We have demonstrated that brain uptake of targeted nanoparticles can be increased by adding a linkage between transferrin (Tf) that is used to target the transferrin receptor on the BBB and the nanoparticle core that is cleavable during the transcytosis process. Results from several preclinical rodent models of brain cancer are presented and reveal that the targeted nanoparticles with cleavable linkages are able to produce efficacy even in models with intact BBBs. Implications for translating this type of nanoparticle into human clinical studies are discussed.

Bio



Mark E. Davis is the Warren and Katharine Schlinger Professor of Chemical Engineering at the California Institute of Technology, and is a member of the Comprehensive Cancer Center at the City of Hope and the Jonsson Comprehensive Cancer Center at UCLA, and is the Caltech director of the USC-Caltech MD-PhD program and the Kaiser Permanente School of Medicine-Caltech MD-PhD program. He has over 450 scientific publications, two textbooks and over 100 US patents. Davis was elected in the National Academy of Engineering in 1997, the National Academy of Sciences in 2006 and the National Academy of Medicine in 2011. In 2014, he received the Prince of Asturias Award for Technical and Scientific Research from the King of Spain, and in 2015, he was elected into the National Academy of Inventors. Davis is the founder of Insect Therapeutics Inc., Calando Pharmaceuticals, Inc. a company that created the first RNAi therapeutic to reach the clinic for treating cancer, Avidity Biosciences and Dantari Pharmaceuticals.