

CHEMICAL ENGINEERING DISTINGUISHED LECTURESHIP



Mark E. Davis

The Warren and Katherine Schlinger Professor of Chemical Engineering of the California Institute of Technology, co-director of the USC-Caltech M.D.-Ph.D. program, and a member of the City of Hope National Medical Center

Friday, November 16

10 a.m.

**100 Life Sciences Building
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Nanoparticle Therapeutics: From Concept to Clinic

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.

About the Speaker

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 co-director of the USC-Caltech MD-PhD program. He has more than 450 scientific publications, two textbooks and more than 90 US patents. Professor Davis is a founding editor of CaTtech and has been an associate editor of Chemistry of Materials and the AIChE Journal. He is the recipient of numerous awards including the Colburn and Professional Progress Awards from the AIChE and the Somorjai, Ipatieff, Langmuir, Murphree and Gaden Prizes from the ACS. Professor Davis was the first engineer to win the NSF Alan T. Waterman Award. He 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. Professor Davis' research efforts involve materials synthesis in two general areas, namely, zeolites and other solids that can be used for molecular recognition and catalysis, and polymers for the delivery of a broad range of therapeutics. He is the founder of Insert Therapeutics Inc., Calando Pharmaceuticals, Inc., a company that created the first RNAi therapeutic to reach the clinic for treating cancer, and Avidity Biosciences. He is/has been a member of the scientific advisory boards of Symyx (Nasdaq: SMMX), Alnylam (Nasdaq: ALNY) and Intellia Therapeutics (Nasdaq: NTLA). Professor Davis has achieved All American Status for Masters Track and Field in the 400, 200 and 100 Meter Dashes. In 2011, he won the 400 Meter Dash for men of age 55-59 at the Masters World Championship.



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