

# 3<sup>rd</sup> International Conference on Medicinal Chemistry & Computer Aided Drug Designing

December 08-10, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

## *In vivo* delivery of transcription factors with chemically modified oligonucleotides

Niren Murthy

University of California at Berkeley, USA

Therapeutics based on transcription factors have the potential to revolutionize medicine, but have had limited medical impact because of delivery problems. In this presentation we demonstrate that a delivery vehicle, termed DARTs (DNA Assembled Recombinant Transcription factors), can for the first time deliver recombinant transcription factors *in vivo*, and rescue mice from acute liver failure. DARTs are composed of a double stranded oligonucleotide that contain a transcription factor binding sequence, and have hydrophobic C<sub>25</sub> alkyl chains located at their 3' ends, which are "masked" by acid cleavable galactose residues. DARTs have a unique molecular architecture, which allows them to complex transcription factors, target hepatocytes, disrupt endosomes, and release transcription factors into hepatocytes. We show here that DARTs can deliver the transcription factor Nrf2, to the liver, enhance the transcription of Nrf2 downstream genes, and protect mice from acetaminophen induced liver injury. The DART delivery strategy has tremendous therapeutic potential given the central role of transcription factors in biology and medicine.

### Biography

Niren Murthy is a professor in the Department of Bioengineering at the University of California at Berkeley. He received his PhD from the University of Washington in Seattle in Bioengineering in 2001, and then did postdoctoral research at U.C. Berkeley in Chemistry from 2001-2003. He started his academic career at Georgia Tech in 2003 and in 2012 moved back to U.C. Berkeley. His laboratory is an interdisciplinary laboratory that focuses on the development of new materials for drug delivery and molecular imaging. The Murthy laboratory has developed several new biomaterials and imaging agents, such as the maltodextrin based imaging agents, which are focused on improving the treatment and diagnosis of infectious diseases. In addition, the Murthy laboratory has developed numerous reagents for detecting radical oxidants, such as the hydrocyanines.

[nmurthy@berkeley.edu](mailto:nmurthy@berkeley.edu)