Pankaj Karande

Associate Professor, Chemical and Biological Engineering at Rensselaer Polytechnic Institute
Troy, NY, US

Focuses on engineering peptides as novel drugs, drug carriers, affinity agents, and biomaterials for medical applications

Biography

Prof. Karande joined the Chemical and Biological Engineering Department at Rensselaer in 2008. Before joining Rensselaer, Prof. Karande was a postdoctoral scholar in the Chemical Engineering Department and Center for Cancer Research at Massachusetts Institute of Technology. He obtained his Ph.D. from UC Santa Barbara in 2006 where his thesis work focused on the use of chemical enhancers for transdermal drug delivery. Prof. Karande has received numerous awards for his work including The Edison Award for best Product in Science and Medicine (2009), The Anna Fuller Fellowship in Molecular Oncology (2006-2007), Outstanding Pharmaceutical Paper by the Controlled Release Society (2005) and the Fionna Goodchild Award for Excellence in Undergraduate Mentoring (2004). Prof. Karande is an inventor on several patents in the area of Transdermal Formulation Discovery and Novel High Throughput Screening Platforms. He has served as scientific advisor to fqubed Inc., a soft materials innovation company (now part of Nuvo research). Prof. Karande?s research program is focused on engineering peptides as novel drugs, drug carriers, affinity agents and multifunctional biomaterials for medical applications. Peptides play vital roles in various biological functions including membrane assembly, cell regulation and immunity. Inspired by their roles in physiological processes, the Karande Lab is evaluating the potential of short peptide sequences as therapeutics for cancer, neurodegenerative diseases, immune disorders and as sub-unit vaccines against infectious diseases. The basic paradigm in contemporary peptide design is based on mimicking and conserving structural themes available in nature. Although such techniques have shown some success they are inherently limited in their potential as they fail to encompass possible structural motifs associated with a broader range of functionalities not seen in nature. Additional limitation of these approaches is the confinement to natural diversities of motifs. Inclusion of synthetic diversities (non-canonical amino acids) in engineered peptide frameworks provides added flexibility in tailoring physical, chemical and biological properties. The lab is interested in exploring the functional landscape of synthetic peptides comprised of a mix of canonical and non-canonical amino acids.

Areas of Expertise

Diagnostics, Vaccine Design, Drug Delivery, Drug Discovery, Peptide Engineering, Biomaterials

Education

UC Santa Barbara
Ph.D.

Mumbai University Institute of Chemical Technology
B.S. Chemical Engineering

Accomplishments

Excellence in Classroom Instruction, School of Engineering
2012

Outstanding Teacher Award, Chemical and Biological Engineering Department
2012

Alzheimer?s Association New Investigator Research Grant
2010
