

Translational Nanomedicine for Heart Disease



Kathryn Uhrich
Professor, Chemistry & Chemical Biology

CURRENT RESEARCH

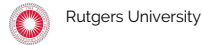
Novel nanotherapeutics target plaque formations in the artery, preventing rupture and debilitating heart disease

Heart disease is a "silent killer" that can occur in young and seemingly healthy patients, and for which statistics are startling. In 2013, the American Heart Association attributed one-in-three adult deaths to cardiovascular diseases (CVD), with annual health care costs of \$315 billion. By 2030, 44% of the US population are estimated to be afflicted with CVD, indicative of its epidemic footprint. Drs. Kathryn Uhrich and Prabhas Moghe, Professor of Chemistry & Chemical Biology and Distinguished Professor of Biomedical Engineering at Rutgers University, respectively, are pursuing a novel approach to treating this modern day epidemic, particularly the acute coronary syndrome, caused by atherosclerosis where unstable plaques formed by cholesterol deposits lining arteries can rupture. Through several years of collaboration, Drs. Uhrich and Moghe have invented a new class of therapeutic candidates called nanolipoblockers, as a nanotechnology solution to target a novel biological mechanism that will stabilize the most at-risk plaques and prevent such catastrophic coronary episodes.

When plaques form from fat accumulated in specific "hot spots" of the blood vessels, they grow and constrict the blood flow, which can lead to heart attacks or can rupture and cause debilitating strokes and/or heart attacks. The nanolipoblockers that Drs. Uhrich and Moghe have developed are nanoscale particles that can travel through circulating blood and reach cholesterol-rich lesions within the blood vessel; they are designed to treat the major step that leads to plaque disease and protect these hot spots from forming unstable and large plaques. Furthermore, Drs. Uhrich and Moghe hope to design the nanoparticles to also reverse...

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AFFILIATION



EDUCATION

- Ph.D. in Chemistry 1992, Cornell University

AWARDS

- Editor-in-Chief of the *Journal of Bioactive and Compatible Polymers*
- Fellow of the National Academy of Inventors
- Coulter Foundation Biomedical Engineering Translational Award

RESEARCH AREAS

Life Science, Regenerative Medicine, Cardiovascular, Immunology / Inflammatory

FUNDING REQUEST

Your contributions will support the collaboration of Drs. Uhrich and Moghe at Rutgers University as they develop new nanotherapeutics to unclog arteries and prevent heart diseases. Although ~\$200K/year will help a chemist to create the nanomaterials and a biomedical engineer to evaluate with appropriate cells, several million dollars would be necessary to complete the pre-clinical work. Help novel nanomedicine for CVD to become a reality; fund Drs. Uhrich and Moghe.