

SMS Fall 2022 Seminar Series

Friday Sept 16 | 2:30pm | Biodesign Auditorium

Adipose Stromal Stem Cell-Targeted Nanoparticles: Browning White Adipose Tissue for Combating Obesity

Browning subcutaneous white adipose tissue (WAT), via targeted delivery of browning agents to adipose stromal stem cells (ASCs) and subsequently inducing their differentiation into beige adipocytes, is a promising strategy for combating obesity and its related metabolic disorders. Trans-resveratrol (R) is such an agent, but its low aqueous solubility, rapid hepatic metabolism, and non-target specificity prevent its practical application. We have overcome these problems by developing ligand-coated R-loaded nanoparticles (L-Rnano) that target ASCs via binding to their glycanation site-deficient decorin receptor, selectively expressed on the ASC surface. When administered intravenously to obese mice, L-Rnano significantly increased the targeted delivery of R to ASCs in subcutaneous WAT and subsequently induced browning of WAT, resulting in a 40% decrease in fat mass, accompanied by enhanced thermogenesis, improved glucose, and lipid homeostasis, and decreased inflammation. These findings suggest that ASC-targeted nanoparticle delivery of browning agents may represent an innovative strategy for combating obesity with high efficacy and low toxicity.

Shu Wang, PhD

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Dr. Wang conducts innovative research in nutrition and nanomedicine. Her research focuses on using biocompatible and biodegradable nanocarriers to enhance bioactivities of phytochemicals for the prevention and treatment of chronic diseases, especially cardiovascular disease and obesity. She has been funded by a variety of federal, industry and foundation agencies. Dr. Shu Wang has received several research honors to recognize the quality of her research. This includes American Heart (AHA) Association Young Investigator Award Finalist, 2014 Chancellor's Council Distinguished Research Award in the Texas Tech University system, and 2017 Mary Swartz Rose Young Investigator Award from American Society for Nutrition. Dr. Wang is a fellow of AHA and a member of the Journal of Nutritional Biochemistry editorial board.



Dr. Shu Wang received her medical degree from Jilin University in China, her master's in biochemistry and molecular biology from Capital Medical University in China, and her Ph.D. in nutritional biochemistry and metabolism from Tufts University in Massachusetts.

*ZOOM option available: <https://asu.zoom.us/j/87081218152>