

Materials Engineering Program
Texas Center for Superconductivity at the University of Houston
Center for Integrated Bio and Nano Systems

Bring the Power of Antibodies to the Bone

April 19, 2024

Face to Face Only, 1:00 – 2:00 pm

Houston Science Center (HSC), Rm 102

Prof. Han Xiao
Rice University



Abstract: Over the past 30 years, antibody-based therapies against cancer have been developed and proved to be successful in the clinic. Despite their clinical success, delivery of these antibodies to the bone niche has proven to be difficult due to relatively low vascularization and the physical barriers of penetration. Inspired by the bone-targeting mechanism of natural biomolecules, we have developed an innovative bone targeting (BonTarg) technology that enables the preparation of antibodies with both antigen and bone specificity. The resulting bone-targeting antibodies exhibit improved in vivo therapeutic efficacy in the treatment of breast cancer micrometastasis and in the prevention of secondary metastatic dissemination from the initial bone lesions. This study establishes a new strategy for transitioning antibody-based therapies from antigen-specific to both antigen and tissue-specific, thus providing a promising new avenue for advancing antibody therapy toward clinical translation.

Bio: Han Xiao is an Associate Professor of Chemistry, and Biosciences at Rice University. Han was born in 1986 in Changchun, Jilin, China. He obtained his undergraduate degree from the University of Science and Technology of China (USTC) where he graduated with a B.S. in chemistry and an honors degree in physical science. He conducted undergraduate research in Prof. Liu-Zhu Gong's group, focusing on organic methodology and synthesis of natural products. After graduating from USTC in 2010, Han joined the Ph.D. program at the Scripps Research Institute (TSRI). His thesis work with Prof. Peter G. Schultz focused on expanding the technique of genetically incorporating unnatural amino acids in both prokaryotic and eukaryotic organisms and applying this technique for better cancer therapeutics. In 2015, Han joined the laboratory of Prof. Carolyn R. Bertozzi as a Good Ventures Postdoctoral Fellow of the Life Science Research Foundation at the Stanford University. In his postdoctoral work, he is engaged in the development of novel cancer immune therapy targeting the cell-surface glycans axis of immune modulation. Enzymatic precision glycoalkyl editing is able to simultaneously stimulate immune-activating pathways and limit immune-inhibitory pathways within immune cells, thus leading to a promising avenue for cancer immune therapy. Currently, Han is an Associate Professor at Rice University in the Department of Chemistry. At Rice, the focus of his research is the development of various chemical biological tools allowing us to understand complex biology system as well as develop novel therapeutic strategies. His research combines elements from multiple disciplines spanning synthetic chemistry, chemical biology, molecular biology, cancer biology and immunology.

Awards and Honors includes: Breast Cancer Research Program (BCRP) Breakthrough Award – Level 2, Department of Defense, 2021, Maximizing Investigators' Research Award for Early Stage Investigators (MIRA), National Institute of General Medical Sciences, 2019, Hamill Innovation Award, Hamill Foundation, 2018, Norman Hackerman - Welch Young Investigator Award, 2017, CPRIT Faculty Recruitment Award, 2017, Good Ventures Postdoctoral Fellowship, 2016, Aldrich Alfred R. Bader Award for Student Innovation, 2014, Outstanding Self-Financed Students Abroad, 2013, Honors Degree in Physical Science (USTC), 2010, National Scholarship (MOE of China), 2008.