

UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

3:00 P.M., Monday, October 17, 2022
Room 105 – Beupre Center

Prof. Matthew D. Shoulders
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Viruses, Evolution, and Protein
Folding

HOST

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Viruses, Evolution, and Protein Folding

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Abstract: Our group is broadly interested in understanding how cells fold complex proteins. The development of chemical genetic techniques to allow precision engineering of proteostasis network composition and activities will be discussed. Applications of these techniques have enabled a variety of advances related to the folding and quality control of large extracellular matrix proteins such as collagen, including the discovery of a molecular code that controls assembly of the fibrillar collagens. Progress in understanding the roles of proteostasis in evolution at the host-pathogen interface will also be presented. For example, we discovered that the biophysical consequences of host chaperone depletion very strongly reduce the ability of influenza to escape innate immune system factors. Key mutations that helped drive the pathogenicity of the 1918 Spanish Flu rely on host chaperones for their fitness. The connections drawn between host proteostasis and viral evolution have potentially important implications for issues including viral host-switching, vaccine development, and the design of improved antiviral therapeutic strategies.