



CHEMISTRY & BIOCHEMISTRY COLLOQUIUM: Drying Without Dying - Desiccation as a Novel Window into Stress Biology

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Date:

9/10/2021

Time:

1:30 PM- 2:30 PM

Link:

Please contact
snsgradstaff@ucmerced.edu for
the Zoom information.

Abstract:

Climate change has accentuated the importance of understanding how organisms respond to stresses imposed by changes to their environment, like water availability. Unusual organisms, called anhydrobiotes, can survive loss of almost all intracellular water. Desiccation tolerance of anhydrobiotes provides an unusual window to study the stresses and stress response imposed by water loss. Because of the myriad of stresses that could be induced by water loss, desiccation tolerance seemed likely to require many established stress effectors. The sugar trehalose and hydrophilins (small intrinsically disordered proteins) had also been proposed as stress effectors against desiccation because they were found in nearly all anhydrobiotes and could mitigate desiccation-induced damage to model proteins and membranes in vitro. In vivo studies of desiccation tolerance in yeast demonstrate the remarkable potency of trehalose and a subset of hydrophilins as the major stress effectors of desiccation tolerance. They act, at least in part, by limiting in vivo protein aggregation and loss of membrane integrity. The apparent specialization of individual hydrophilins for desiccation tolerance suggests that other hydrophilins may have distinct roles in mitigating additional cellular stresses, thereby defining a potentially new functionally diverse set of stress effectors.