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The Interplay Between Proteins and their Environment

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ABSTRACT

The cell contains thousands of different molecules that are in constant flux due to external environmental changes or internal cell cycle events. Proteins are thought to be robust to these fluxes; yet this view contradicts decades of in vitro experiments highlighting the sensitivity of proteins to solution conditions. Using a combination of live cell microscopy and in vitro biophysical methods, I show that routine changes in the cellular environment can alter protein structure, function, and interaction. I discuss how cellular environment changes can act as regulatory signals in both health and disease, and how solution composition can be used as a tool to control protein function in vitro.

