

Looking at Proteins in Cells with Atomic Resolution: From Science Fiction to Science Reality

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Abstract

Most proteins function inside cells and, thereby, act in an environment that is strikingly different than most of the experimental setups that we typically employ to characterize them. Ideally, we would like to study proteins directly in intact cells, which is incompatible with most of the methods in Structural Biology. Here, I present the use of in-cell NMR spectroscopy to delineate atomic resolution insights into intracellular protein structures. In particular, I demonstrate how we apply this tool to study the pathological structural transitions of amyloid proteins in the course of neurodegenerative disorders such as Parkinson's disease, directly in cultured neuronal cells.