

# Neutron Scattering Studies of Protein Dynamics and Its Associated Quantum Effects in Biological Systems

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## Abstract

The roles of quantum effects in biological systems have long fascinated biophysicists. Meanwhile, proteins undergo sophisticated motions in space and time, which are believed to ultimately govern the biological function and activities of the proteins. Quasi-elastic neutron scattering (QENS) provides exceptional tools for studying the dynamics of proteins in the time range of picoseconds to nanoseconds at the molecular level. This talk will present our recent work on various biological systems studied by QENS and other techniques, such as inelastic neutron scattering (INS), small angle neutron scattering (SANS), and neutron spin echo (NSE), and will further discuss the possibility of using neutron scattering techniques to reveal the quantum mechanical effects, such as tunneling effect in the dynamics of proteins and connect them with protein activities or functions.

Prof. Xiang-qiang (Rosie) Chu received her B.S. and M.S. degrees in Physics from Peking University, and her Ph.D. in Nuclear Science and Engineering from Massachusetts Institute of Technology (MIT) in 2010. After two years of postdoctoral research at Oak Ridge National Laboratory (ORNL), she joined the Department of Physics and Astronomy at Wayne State University, USA, as an Assistant Professor in 2012. She was promoted to Associate Professor with tenure in 2017 before she was awarded the “1000 Young Talents Plan” of China and joined the Graduate School of China Academy of Engineering Physics (GSCAEP) as a professor. She joined the City University of Hong Kong as an associate professor with tenure in 2022. Her research interests focus on probing the conformation and dynamics of biomolecules, their interactions with water, and quantum effects in biological systems through neutron and X-ray scattering techniques. She is a member of the CityU Center for Neutron Scattering (CNS). She has been a review panelist for many national facilities, including ANSTO (Australia), ISIS (UK), ORNL (USA), J-PARC (Japan), CSNS (China Spallation Neutron Source), and SSRF (Shanghai Synchrotron Radiation Facility).

