

# A critical role for glassy states Biomolecular Condensates in Nanoscale Regulation of Biology

**Prof Kenneth Dawson**

Centre for Bionano Interactions (CBNI)

School of Chemistry, University College Dublin, Belfield, Dublin 4, Ireland

kenneth.a.dawson@cbni.ucd.ie

Nanoscale objects are processed by living organisms using highly evolved and sophisticated endogenous cellular networks, specifically designed to manage objects of this size. While these processes potentially allow nanostructures unique access to and control over key biological machineries, they are also highly protected by cell or host defence mechanisms at all levels. A thorough understanding of bionanoscale recognition events, including the molecules involved in the cell recognition machinery, the nature of information transferred during recognition processes and the coupled downstream cellular processing, would allow us to achieve a qualitatively novel form of biological control and advanced therapeutics. Here we discuss evolving fundamental microscopic and mechanistic understanding of biological nanoscale recognition. We consider the interface between a nanostructure and a target cell membrane, outlining the categories of nanostructure properties that are recognized, and the associated nanoscale signal transduction and cellular programming mechanisms that constitute biological recognition.

## REFERENCE

Dawson KA, Yan Y, *Nature Nanotechnology* volume 16, pages 229–242 (2021)

## FIGURES