

# The path to condensates- 19th Wiley Prize in Biomedical Sciences Laureates share their discovery stories

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## Abstract

Preface by Prof. Titia de Lange, Laboratory for Cell Biology and Genetics, The Rockefeller University, New York, NY 10065, USA The 19th Annual Wiley Prize in Biomedical Sciences celebrated a breakthrough in cell biology: how membrane-less cellular compartments are formed. The existence of membrane-less organelles, often called bodies or puncta, have been known for a long time, but what exactly they represented and how they were formed was not known. This problem was solved by a physicist, Clifford Brangwynne, a cell biologist, Anthony Hyman and a chemist, Michael Rosen. Each, synergistically, made groundbreaking contributions to the discovery that membrane-less organelles are liquid-liquid phase-separated entities. The two independent discoveries leading to the principle that multivalent low-affinity interactions between selected sets of macromolecules, some containing intrinsically disordered regions, formed a molecular condensate with unique dynamic properties, gave birth to the large, blossoming field of biomolecular condensates. The implications of those findings have influenced almost all further research of intracellular processes, including RAS signaling, immune synapses, DNA repair, transcriptional activation, and the functions of nuclear pores, the nucleolus and centrosomes. In this Perspective article, the laureates of the award take us on their personal and professional trip that led to their scientific discoveries. Their stories are a celebration of the interdisciplinary essence of Natural Sciences and the potential unlocked when scientists from different fields work together to solve mysteries.

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