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'How the ideas of soft matter physics help us understand cellular organization.'

Living cells contain myriad internal substructures that spatially organize complex biochemical reactions and play a vital role for life. The last several decades have been instrumental in putting together the parts lists of individual organelles. However, we still lack a mechanistic understanding of the molecular biophysical principles underlying mesoscale organization. The next challenge will be to uncover how molecular machines that act at the Angstrom scale are coordinated in space and time to create physiological structures in the micrometer scale that enable cell function. Recent biophysical studies show that an increasing number of intracellular organelles behave like liquids that form by phase separation from the cytoplasm.