

Abstract Submitted
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Phase separation and the formation of cellular bodies BIN XU, Department of Physics, Princeton University, CHASE P. BROEDERSZ, Faculty of Physics, Ludwig-Maximilians-University of Munich, YIGAL MEIR, Department of Physics, Ben-Gurion University, NED S. WINGREEN, Lewis-Sigler Institute for Integrative Genomics, Princeton University — Cellular bodies in eukaryotic cells spontaneously assemble to form cellular compartments. Among other functions, these bodies carry out essential biochemical reactions. Cellular bodies form micron-sized structures, which, unlike canonical cell organelles, are not surrounded by membranes. A recent *in vitro* experiment[1] has shown that phase separation of polymers in solution can explain the formation of cellular bodies. We constructed a lattice-polymer model to capture the essential mechanism leading to this phase separation. We used both analytical and numerical tools to predict the phase diagram of a system of two interacting polymers, including the concentration of each polymer type in the condensed and dilute phase.

References

- [1] Li P, Banjade S, Cheng HC, Kim S, Chen B, Guo L, Llaguno M, Hollingsworth JV, King DS, Banani SF, Russo PS, Jiang QX, Nixon BT, Rosen MK *Phase transitions in the assembly of multivalent signalling proteins* Nature. 2012 Mar 7;483(7389):336-40.

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