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Phase transition in Caenorhabditis elegans: A classical oil-water phase separation? CHRISTOPH WEBER, MPIPKS Dresden, FRANK JÜLICHER TEAM, TONY HYMAN COLLABORATION, ANDRÉS DELGADILLO COLLABORATION — In Caenorhabditis elegans droplets form before the cell divides. These droplets, also referred to as P-granules, consist of a variety of unstructured proteins and mRNA. Brangwynne et al. [Science, 2009] showed that the P-granules exhibit fluid-like behavior and that the phase separation is controlled spatially by a gradient of a component called Mex-5. It is believed that this system exhibits the same characteristics as a classical oil-water phase separation. Here we report the recent experimental investigations on the phase separation in Caenorhabditis elegans and compare our findings with a classical oil-water phase separation. Specifically, we consider the underlying coarsening mechanisms as well as the impact of temperature and species composition. Finally, we present a preliminary model incorporating the characteristics of the phase separation kinetics for Caenorhabditis elegans.

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