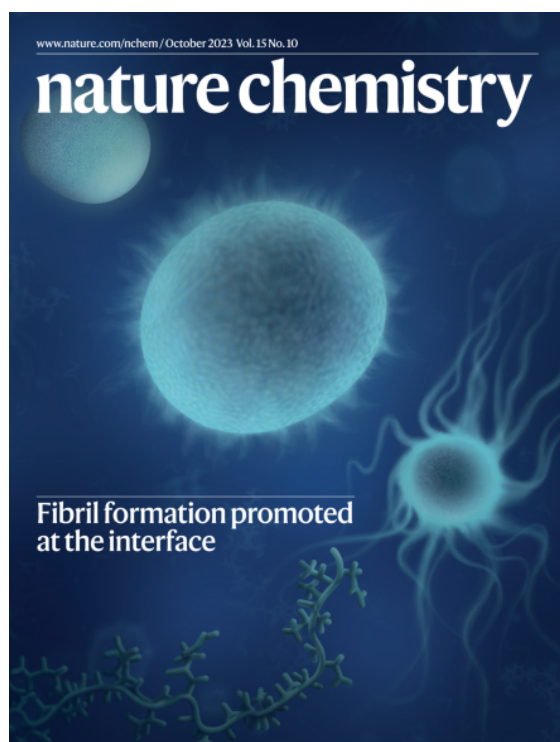




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Interplay between biomolecular condensates and amyloid formation



It is emerging that cells can coordinate biochemical activity in space and time via membraneless organelles formed by phase separation of proteins and nucleic acids. In some cases, the maturation of these organelles, also known as biomolecular condensates, into amyloid fibrils has been associated with neurodegenerative diseases. The mechanisms regulating the formation of fibrils from these multicomponent biomolecular condensates are still largely unclear. Here, we show effects that go beyond the local increase of protein concentration due to phase separation. In particular, we demonstrate the effect of interface [1], and heterotypic interactions [2] on amyloid formation mediated by condensation. We focus on the formation of amyloids from biomolecular condensates of hnRNPA1, a protein involved in Amyotrophic Lateral Sclerosis (ALS).

[1] Linsenmeier M. et al., Nat. Chem., 2023, 15, 1340-1349.

[2] Morelli C. et al., Nat. Chem., 2024,
DOI: 10.1038/s41557-024-01467-3.

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Ospite: Prof. Paolo Bergese