Title:	Spatiotemporal modulations in heterotypic condensates of prion and α-synuclein control phase transitions and amyloid conversion
Authors:	Agarwal, Aishwarya (/jspui/browse?type=author&value=Agarwal%2C+Aishwarya) Arora, Lisha (/jspui/browse?type=author&value=Arora%2C+Lisha) Rai, Sandeep K. (/jspui/browse?type=author&value=Rai%2C+Sandeep+K.) Avni, Anamika (/jspui/browse?type=author&value=Avni%2C+Anamika) Mukhopadhyay, Samrat (/jspui/browse?type=author&value=Mukhopadhyay%2C+Samrat)
Keywords:	Spatiotemporal modulations heterotypic condensates of prion and α-synuclein control amyloid conversion
Issue Date:	2022
Publisher:	Springer Nature
Citation:	Nature Communications, 13(1), 1154
Abstract:	Biomolecular condensation via liquid-liquid phase separation of proteins and nucleic acids is associated with a range of critical cellular functions and neurodegenerative diseases. Here, we demonstrate that complex coacervation of the prion protein and α-synuclein within narrow stoichiometry results in the formation of highly dynamic, reversible, thermo-responsive liquid droplets via domain-specific electrostatic interactions between the positively-charged intrinsically disordered N-terminal segment of prion and the acidic C-terminal tail of α-synuclein. The addition of RNA to these coacervates yields multiphasic, vesicle-like, hollow condensates. Picosecond time-resolved measurements revealed the presence of transient electrostatic nanoclusters that are stable on the nanosecond timescale and can undergo breaking-and-making of interactions on slower timescales giving rise to a liquid-like behavior in the mesoscopic regime. The liquid-to-solid transition drives a rapid conversion of complex coacervates into heterotypic amyloids. Our results suggest that synergistic prion-α-synuclein interactions within condensates provide mechanistic underpinnings of their physiological role and overlapping neuropathological features
Description:	Only IISERM authors are available in the record
URI:	http://hdl.handle.net/123456789/4454 (http://hdl.handle.net/123456789/4454)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format	
Need To Add…Full Text_PDF..pdf (/jspui/bitstream/123456789/4454/1/Need%20To%20Add%e2%80%a6Full%20Text_PDF..pdf)		15.36 kB	Adobe PDF	View/Open (/jspu

Show full item record (/jspui/handle/123456789/4454?mode=full)
(/jspui/handle/123456789/4454/statistics)