Signed statement from the applicant to the effect that the research work under reference has not been given any award in the past. The applicant should also indicate the extent of the contribution of others associated with the research and he/she should clearly identify his/her achievements (not to exceed 500 words)

The research work on liquid-liquid phase separation of α-Synuclein (α-Syn) and liquid-liquid phase separation of proteis/polypeptides has not been given any award in the past. Our work on this area of research has resulted in two publications in top-notch peer-reviewed journals. We recently demonstrated that α-Syn undergoes liquid-liquid phase separation (LLPS) (similar to oil droplet in water) in the cytoplasmic crowded milleu (*Ray et al Nature chemistry, 2020*). The high local concentration triggers liquid-to-solid transition in which amyloid-like fibrils emerge from the solid droplet. Additionally, we demonstrated that all proteins/polypeptides irrespective of diverse sequence, structure and properties can phase separate in a crowded milieu, however, phase regimes and kinetics differs from protein to protein. (*Poudyal et al. Nature Communications, 2023).*

1. Ray, S., Singh, N., Kumar, R., Patel, K., Pandey, S., Datta, D, Mahato, J., Panigrahi R., Navalkar, A., Mehra, S., Gadhe, L., Chatterjee, D., Sawner AS.,Maiti, S., Bhatia, S., Gerez, J., Chowdhury, A., Kumar, A., Padinhateeri, R., Riek, R., Krishnamoorthy, G and **Maji, S. K** (2020) α-Synuclein aggregation nucleates through liquid-liquid phase separation, ***Nature Chemistry***, 12, 705–716

Contribution: Prof. Maji conceived the idea. The study was designed, directed and coordinated by Prof. Maji as Principal Investigator. He provided the infrastructure and funding for conducting all the experiments. He provided conceptual and technical guidance throughout the project. Most of the experiments (~90 %) were performed in Prof. Maji's lab.

NMR study was done in Prof. Ashutosh Kumar's lab and single droplet imaging and spectroscopy was done in Prof. Arindam Chowdhury's lab (IIT Bombay).

Time resolved fluorescence studies were done in consultation with Prof. G.Krishnamoorthy and Prof. Ranjith Padinhateeri provided helped in analysing data (IIT Bombay).

Prof. Roland Riek provided C4-α-Syn cell line (ETH Zurich).

2. Poudyal, M., Patel, K., Gadhe, L., Sawner, AS., Kadu, P., Datta, D., Mukherjee, S., Ray, S., Navalkar A., Maiti, S., Chatterjee, D., Devi J., Bera R., Gahlot, N., Joseph J., Padinhateeri, R and **Maji, S. K** (2023) Intermolecular interactions underlie protein/peptide phase separation irrespective of sequence and structure at crowded milieu, ***Nature Communications***, 14:6199

Contribution: Prof. Maji conceived the idea. The study was designed, directed and coordinated by Prof. Maji as the Principal Investigator. He provided the infrastructure and funding for conducting all the experiments. He provided conceptual and technical guidance throughout the project. Prof. Maji and his team analysed the data, interpreted the results and contributed to drafting the manuscript and critical revision.

Prof. Ranjith Padinhateeri helped in analysing data (IIT Bombay).

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