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Theory of protein misfolding and applications to misfolding diseases

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Physics-based algorithms can predict the misfolding mechanisms of proteins involved in aggregation-related diseases, including ALS and the Prion diseases. Predictions based on such an algorithm that we have developed, which employs both atomistic interactions and surface-area based coarse-graining, have been recently verified by immunological assays and point to diagnostic and therapeutic applications. I will describe the results of our misfolding theory, and discuss future directions towards drug research.