Tracking protein aggregation by intrinsic TRES

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Abstract

We report the use of time-resolved emission spectra (TRES) to provide an insight into self-assembly of a de novo peptide named fibrillogenesis imaging model (FiM) and insulin.

FiM is a synthetic coiled-coil trimer that was engineered to predictably self-assemble from monomers into micron-long fibres. It has been previously labelled with Alexa Fluor 488 (FiM-488) for studying with super resolution imaging [1]. In order to provide a more native approach to track self-assembly, FiM was labelled with an intrinsic fluorophore, tyrosine (FiM-Y). It is a longitudinal assembly, which may provide a better understanding of the assembly of natural protein of relevance to amyloid disease.

With this in mind, we have compared FiM-Y with the natural protein insulin that is known to readily form fibrous structures [2]. As they both contain intrinsic tyrosine fluorophores, TRES has been used to extract useful comparative information e.g. conformational changes, dielectric relaxation and the protein stability from both structures [3].

References

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