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Copper-selective biosensor based on an amyloid-β peptide

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Fluorescent sensors for Cu(II) have been recently developed using peptide motifs from metal binding proteins. This has proved to be a better approach than using chelator motifs since the protein's metal selectivity is maintained. Several proteins associated with neurodegenerative disorders, such as prion protein (PrP), amyloid-β (Aβ) and α-synuclein all possess copper-binding sequences in their N-terminus. Here we present that fluorescent dye conjugated N-terminal Aβ peptide could potentially be developed as an excellent Cu(II) biosensor. The feasibility for *in vivo* applications such as detecting the copper release in synapse has been explored by determining the rate of binding of copper ions to $A\beta_{1-16}$. It was also found by simulation and experiment that the peptide sensor can efficiently compete with copper-binding amino acids, such as glycine and glutamate, rich in the synaptic clefts of neurons.

Biography

Liming Ying obtained his Ph.D. in Physical Chemistry from Peking University. After postdoctoral studies at the University of Cambridge, he was awarded a BBSRC David Phillips Research Fellowship. He joined Imperial College London in 2006. His research focuses on single molecule imaging, bionanotechnology and DNA quadruplexes. He has authored/co-authored over 75 peer-reviewed papers (h-index 26) and three patents.

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