In situ-synthesized of peptide on magnetic graphene oxide as FRET biosensor paltform for β-secretase detection

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Alzheimer's disease, one of the most common form of dementia, has relatively high incidence rate. Alzheimer's disease is caused by the accumulation of amyloid beta peptide (Aβ) in brain regions. Several enzymes are involved through the metabolic pathway on the Ab peptide formation. Among them, β-secretase takes an important role at the initial stage of Aβ peptide formation. So, the powerful biosensor for detecting β-secretase can be the promising tool for early diagnosis of Alzheimer's disease, which can be connected to the ealry therapetic treatment. Here, we report novel fluorescence resonance energy transfer (FRET)-based biosensor platform composed of in situ-synthesized peptide and magnetic graphene oxide(MGO). Graphene oxide that has high specific surface area and biocompatibility can provide a suitable biosensor platform and can be decorated with Fe3O4 for easy seperation and purification. After then, specific peptide sequence for β-secretase was sythesized on MGO and FITC was labeled at the end of the peptide. The FRET performance as a fluorescence ON biosensor was finally evaluated by changing β-secretase concentration, assay time and so on.