

Sensitive and specific diagnostic assay using ferritin based 3D nanostructure

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Ferritin based nanoprobe - 3D porous nanostructure was synthesized through a simple one-step and used as a diagnostic assay platform to solve the traditional problems (i.e. low sensitivity and specificity, infeasibility of multiplex assay, random orientation of probes, probe instability, uncontrollable probe loading, etc.) of ELISA based bioassays. Here we show superior advantages of the diagnostic assays based on Ferritin based nanoprobe - 3D porous nanostructure : probe immobilization without random orientation problem, controllable loading of homogeneously oriented probes, protein-friendly environment, sufficient storage stability, much higher sensitivity than ELISA. Ferritin based nanoprobe - 3D porous nanostructure was successfully applied to the sensitive and specific diagnostic assays of AD1 (Autoimmune disease 1). Although the diagnostic assay of AD1 was demonstrated as proof-of-concept in this study, Ferritin based nanoprobe - 3D porous nanostructure can be applied in general to sensitive and specific detection of many other disease markers.