# Development of novel nanozymes to replace natural enzyme in bioassays

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Recently, nanomaterial-based enzyme mimics, called "nanozymes", have been widely studied due to their superior qualities such as extremely high stability with robustness even under stringent conditions, tunable catalytic activity and specificity, and ability to be synthesized on a large-scale at low costs. In this presentation, I will discuss the current progresses how to develop novel nanozymes and their representative biosensing applications. First, I will describe a simple colorimetric strategy for the detection of nucleic acids, which relies on target DNA-induced shielding action against the activity of magnetic nanoparticles (MNPs) and cerium oxide nanoparticles. Second, I will discuss a nanostructured multi-catalyst system consisting of MNPs and oxidative enzymes entrapped in mesoporous material for convenient detection of biologically important target molecules. Finally, I will describe biosensors based on new nanozymes including Fe-aminoclay, Cu-nanoflower, N & B-doped graphene, and Fe-$N_4$-graphene. These achievements should accelerate and widen the utility of nanozymes as next-generation alternatives to natural enzymes.