AAPEPTIDES BASED NANOMATERIALS. Jianfeng Cai, Youhong Niu, Qiao Qiao, Yaogang Hu, Haifan Wu. Department of Chemistry, University of South Florida, 4202 E. Fowler Ave, Tampa, FL 33620

Although peptide-based nanomaterials have been explored for different applications, sequence-specific peptidomimetics based nanostructures are much less developed through hierarchical molecular-assembly. Such protein-like nanomaterials could enhance the current application of peptide-based amphiphiles by enriching the diversity of nanostructures, increasing in vivo stability for biomedical applications, and facilitating the understanding of biomacromolecular self-assembly. Herein we present the development of a new class of peptidomimetics-AApeptide-based nanomaterials. We show these molecules can self-assemble into different well-defined nanostructures, such as giant nanorods, nanoparticles, and nanofibers. Our results demonstrate the capability of AApeptides as the versatile scaffold for the preparation of biomimetic and bioinspired nanostructures. The programmability and biocompatibility of AApeptides could lead to novel nanomaterials for a wide variety of applications through straight-forward functionalization.