

Single-Chain Soft Nanoparticles as Bioinspired Nanomaterials

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Abstract

Linear polymer chains can be folded / collapsed to individual, single-chain nanoparticles (SCNPs) by means of different intra-chain cross-linking techniques [1] (Figure 1). SCNP formation is reminiscent of protein folding although current synthetic methods lack the perfection of protein folding to functional enzymes [2]. In recent years the structure–function paradigm (*i.e.*, amino acid sequence → 3D structure → function) has been revisited by taking into account that many non-structured segments of proteins, and even totally disordered proteins, play important roles in protein function [3]. In this Keynote lecture we highlight the significant added value (enzymatic catalysis, drug binding/delivery) that can be endowed to SCNPs by taking inspiration from the functions of both ordered and disordered proteins [4].

References

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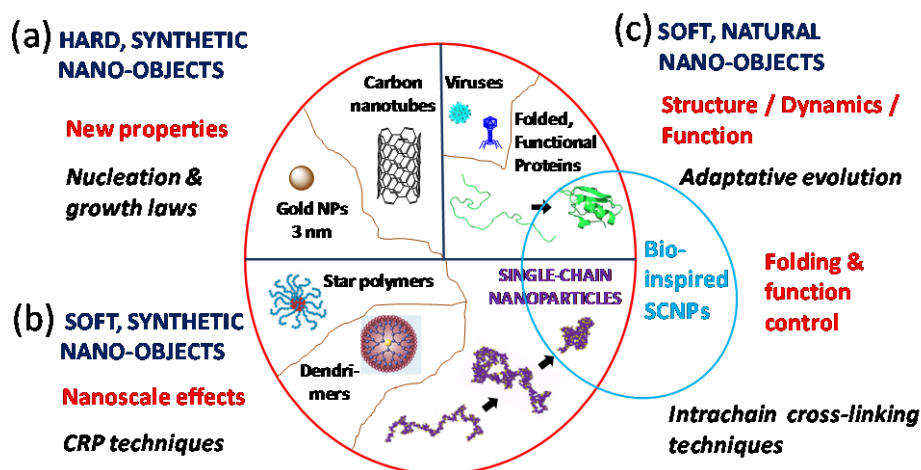


Figure 1. Illustration of hard (a) and soft (b) synthetic nano-objects. Biomimetic SCNPs can be constructed by taking inspiration from the functions of soft, natural nano-objects (c) and, in particular, from both folded proteins and intrinsically disordered proteins [4].