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Sommario/riassunto	Biomolecular self-assembly provides a green, facile, and highly effective method to synthesize various functional nanomaterials that have exhibited considerable potential in the fields of nanotechnology, materials science, biomedicine, tissue engineering, food science, energy storage, and environmental science. In this collection of articles, we presented recent advance in the synthesis, characterization, and applications of self-assembled bio-nanomaterials. In a comprehensive review article, the controlled self-assembly of biomolecules including DNA, protein, peptide, enzymes, virus, and biopolymers via internal interactions and external simulations is introduced and discussed in detail. In other research articles, the self-assembly of DNA, protein, peptide, bio-drugs, liquid crystal polycarbonates, and diblock copolymers to various biomimetic/bioinspired nanomaterials and their potential applications in nanopatterning, sensors/biosensors, drug delivery, anti-parasite, and water purification are demonstrated.