REPURPOSING PEPTIDES FOR MATERIALS AND NANOTECHNOLOGY

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ABSTRACT

Through billions of years of evolution and optimization, biology has developed highly effective solutions for catalysis, sensing, energy storage and conversion, etc. under ambient conditions. It is therefore no surprise that living systems serve as inspiration for development of next generation nanotechnology and nanofabrication approaches. It is our aim to develop functional nanostructures that mimic the ability of living systems to sense, adapt, convert energy and respond to new situations but are drastically simplified, robust and functional. The design and selection of suitable self-assembling sequences is, however, challenging due to the vast combinatorial space available. We will report on directed discovery methodology that allows the peptide sequence space to be searched for self-assembling structures using computation and experiment. An additional challenge in mimicry of living materials is that they actively (rather than passively) respond to new situations. We will report our progress in developing such non-equilibrium nanostructures. A number of examples of functional bio-inspired nanostructures will be discussed with applications in design of responsive biomaterials and tunable emulsifiers.

References:

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