

Nanobiotechnology: Biology Enabled Nanotechnology

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Nature provides inspiration for the design of engineering structures and protocols for processing towards fabrication of the practical materials. During the last two decades, the realization that materials have interesting physical characteristics based on their nanometer scale properties has driven new potentials in both engineering and medical systems. The highly organized structures observed at the molecular-, nano-, micro and macro scales in biological materials ultimately result in myriad of different soft and hard tissues. There is an increasing awareness and proof-of-principle demonstrations that following the biological routes it may be possible to create controlled structures for practical everyday systems. To achieve the goal of efficiently producing materials using the biological approaches on a routine bases requires the adaptation of bold, transformative approaches that will reshape technology and medicine. These approaches require the development of novel platforms where the genes, biological components, synthetic and hybrid systems will be in the forefront necessitating a combination of integrated interdisciplinary expertise in a wide range of diverse fields. To demonstrate these points, I will present examples of novel bionanotechnological systems, mainly towards regenerative medicine implementations.

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