

Biomimicry: science of nature inspires design of high-tech performance apparel

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Abstracts

Biomimicry - often referred to as biomimetics - can be defined as the study of designs, models and systems in nature for the purpose of imitating and adapting them or gaining inspiration from them to create practical solutions to everyday problems. Animals, insects, plants and other living organisms have evolved over billions of years in order to survive and adapt in dynamic environments, and many natural adaptations have proved to be more effective than man-made solutions. Biomimicry has been exploited in the creation of performance apparel fabrics with a wide variety of functional properties, including antimicrobial efficacy, camouflage, drag reduction, dry adhesion, thermal insulation and water repellency. Also, biomimicry has been used to develop processes for imparting properties using materials, methods and technologies which are more environmentally friendly than those used conventionally. This report provides an introduction to biomimicry and its importance to the development of functional performance apparel. Also, it includes case studies of materials and performance apparel products which have functional features replicated from nature. Furthermore, the report discusses the topics of biomimicry and sustainability, and provides an outlook for the future.

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Chitosan

Shark skin

Bioluminescence

Camouflage

Drag reduction

Dry adhesion

Burdock plant

Gecko feet

High strength

Limpet teeth

Spider silk

Moisture management

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