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BIOMATERIALS

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Millions of years of evolution have made the biological world into a supremely effective materials-development laboratory. This Outlook examines the ways in which substances found in the natural world are inspiring imitations that might eventually endow humans with superhuman powers (see page S2).

We begin the exploration with a close look at a familiar creature: the spider (S4). The silk that these arthropods use to spin webs is extraordinarily tough. Indeed, the scene from *Spider-Man 2* in which a New York City subway train is stopped by a spiderweb is not far removed from the realms of reality. Scientists are learning how to fabricate synthetic versions of these fibres.

Other researchers are studying plants and animals for ideas on how to design coatings and textures that imbue surfaces with special properties, such as the extreme stickiness of gecko feet (S7). In the sea, the adhesive that mussels use to cling to slippery rocks is leading to the development of polymeric glues that could repair wounds (S12). Hard natural materials such as bone and fish scales have intricate structures that could potentially lead to flexible, protective armour (S14). And what better inspiration for improving clothes than the tissues that shield plants and animals from the elements and provide them with adaptive camouflage (S10)?

Biomaterials are essential in developing organ-on-a-chip technology (S16). And they have a promising niche in improved drug-delivery systems that would go a long way to solving one of medicine's biggest problems: that patients rarely follow their prescribed course of treatment (S19).

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Herb Brody

Supplements Editor

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