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BIOMATERIALS

Biomaterials research has come of age. Since antiquity, humans have been taking whatever substances are at hand — natural materials, glass, metals or polymers — and using them to replace body parts that have been damaged by disease or injury. But it is only recently, with the advent of molecular biology, that the field has become interdisciplinary, enabling materials scientists to design materials that impart a specific biological function. The field of biomaterials is also broadening as we improve our understanding of how the physical sciences can help to explain biology and indeed of how biological principles, mechanisms and molecules can be applied in the design of materials for non-biological applications.

This Insight explores areas of research in which recent advances in basic biology are driving materials scientists to think differently when developing new materials. Biomaterials science encompasses a huge body of research work, and the Overview article captures the big picture of the field. The Reviews focus on several of the many emerging areas of research that have yielded exciting advances and should continue to do so in the foreseeable future. The design of materials to interact with stem cells and with the immune system is explored, as well as how the fields of arachnid and plant biology could lead to new biologically inspired technologies. We are pleased to highlight that the authors of these Reviews span the physical and biological sciences, celebrating the interdisciplinary nature of the topics covered.

Finally, a Perspective article discusses the challenges that biologists are presenting to materials scientists to design tools for better biodiagnostics. The extreme sensitivity of future devices could, in turn, lead to new challenges for biologists, in how biological processes and disease states are quantified.

Rosamund Daw, Senior Editor, Nature
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