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REGENERATIVE MEDICINE

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Bodies wear out. Tissue thins and tears. Organs stop functioning. Cells lose their biological way. Trauma breaks things. And as a result, we become ill or disabled. This has always been our fate.

Regenerative medicine is the bold collection of techniques and technologies that aim to restore our physiology to something that resembles its original condition. Its roots trace back to antiquity (see page S50) but it has, in recent years, become much more effective. For example, 3D printers can construct tissue and organs that in some cases can function as well as the originals (S56). The central nervous system, however, has proved stubbornly difficult to repair. Scientists hope that stem-cell advances might finally restore mobility to those with spinal-cord injuries (S52). Excitement is already building over the potential of these intriguing cells to create drug-free treatments for chronic diseases such as type 1 diabetes (S60). Regeneration researchers are also taking cues from the animal world: species such as salamanders have the power to regrow limbs. Understanding the cellular mechanisms behind this ability might lead to techniques that can work in humans (S58). Indeed, one scientist argues that for progress to continue, researchers will need to do a better job of emulating and working alongside natural systems (S55).

The creation of these therapies brings with it questions of how to regulate them. Clinics are sprouting up to offer dubious stem-cell-based treatments for dire conditions, and policymakers are crafting rules to accelerate the availability of effective treatments without endangering desperate patients (S64).

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Herb Brody

Chief supplements editor

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