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PRECISION MEDICINE

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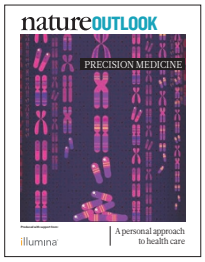

Cover art: Andrew Baker

The underlying concept of precision medicine, in which health care is individually tailored on the basis of a person's genes, lifestyle and environment, is not new: transfusion patients have been matched with donors according to blood type for more than a century (see page S52). But advances in genetics, and the growing availability of health data, present an opportunity to make precise personalized patient care a clinical reality.

Since the first human genome was sequenced in 2001, after more than a decade and at a cost of around US$3 billion, the technology has become much faster and cheaper. Many genomes can now be sequenced in a single day for around $1,000 each (S54). As a result, genome sequencing is entering medical practice, particularly to diagnose rare disorders, where conventional techniques have failed (S64).

On the treatment front, despite a series of setbacks, several gene therapies are edging closer to approval (S57). A few medical centres are pioneering pharmacogenetics, using an individual's genome to prescribe the safest, most effective drug for them, and are developing the infrastructure needed to make it work in a clinical setting (S60). But some researchers argue that more evidence of benefit is required first (S63).

Precision medicine is powered by patient data. The health records and genetic codes of patients and healthy volunteers are vital, and help people to influence their own health care and the direction of research (S66). Securing participants' trust is crucial to the success of large-scale programmes such as the US National Institutes of Health's Precision Medicine Initiative (S69). But this is hard when the promised anonymity is revealed to be little more than a fig leaf (S70).

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Richard Hodson
Supplements editor

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