

Precision oncology



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Around the turn of the twentieth century, researchers realized that radiation could be used to treat cancer. In the 1950s, drugs that could block crucial functions of cancer cells began to emerge. Now, well into the twenty-first century, radiotherapy and chemotherapy still stand alongside surgery as the most common forms of cancer treatment. But, as some people with cancer are already finding out, there is another way.

The premise of precision oncology is to develop treatments that target the molecular characteristics of an individual's tumour. Some treatments go as far as to eschew the question of where in the body the tumour originated, and instead focus on particular genetic mutations (see page S16). The emergence of this kind of targeted treatment is an exciting moment in the battle against cancer. But for the precision-oncology dream to be fully realized, the therapies must help more people with cancer than the 5–10% who currently benefit.

One way to do this is to identify more molecular targets. Precision oncology has tended to focus on the cancer genome, but also taking into account RNA and proteins, for example, could identify new options for targeted treatments (S7). Real-world data, such as those found in the rapidly expanding corpus of electronic health records, are being mobilized to assist in testing the efficacy of treatments (S19).

Researchers are also considering how to make the latest and best cancer treatments more accessible. An off-the-shelf approach to a form of cell therapy that is normally tailored to the individual, for instance, could help to reduce the high cost of the treatment (S4). But without sustained effort to address systemic bias, precision oncology is likely to deepen persistent inequalities in health care (S13).

The enduring treatments of radiotherapy and chemotherapy will remain the standard cancer care for many years – they, too, are improving all the time (S10). For some people with cancer, precision oncology offers a compelling advantage over conventional therapy. But only with much broader access will the approach be truly transformative.

We are pleased to acknowledge the financial support of F. Hoffmann-La Roche in producing this Outlook. As always, *Nature* retains sole responsibility for all editorial content.

Richard Hodson
Supplements editor

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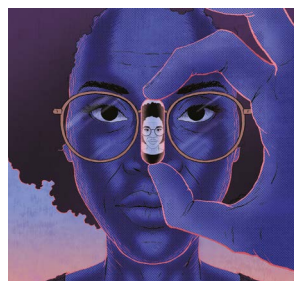
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In precision oncology, treatment is tailored to an individual.
Credit: Antoine Dore

About Nature Outlooks

Nature Outlooks are supplements to *Nature* supported by external funding. They aim to stimulate interest and debate around a subject of particularly strong current interest to the scientific community, in a form that is also accessible to policymakers and the broader public. *Nature* has sole responsibility for all editorial content — sponsoring organizations are consulted on the topic of the supplement, but have no influence on reporting thereafter (see go.nature.com/33m79fz). All *Nature Outlook* supplements are

available free online at go.nature.com/outlook

How to cite our supplements

Articles should be cited as part of a supplement to *Nature*. For example: *Nature* Vol. XXX, No. XXXX Suppl., Sxx–Sxx (2020).

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