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Hope in translation

An increasing number of biomedical researchers are testing their ideas on people. The early-phase clinical-trial results are a promising sign of greater cooperation between scientists and clinicians.

The readers of *Nature* should be an optimistic bunch. Every week we publish encouraging dispatches from the continuing war against disease and ill health. Genetic pathways are unravelled, promising drug targets are identified and sickly animal models are brought back to rude health. Yet the number of human diseases that can be efficiently treated remains low — a concerning impotency given the looming health burden of the developed world's ageing population. The uncomfortable truth is that scientists and clinicians have been unable to convert basic biology advances into therapies or resolve why these conversion attempts so often don't succeed. Together, these failures are hampering clinical research at a time when it should be expanding.

Enter translational research. The concept has been pushed hard over the past decade by funders as a way to bridge the gap between the laboratory and the clinic. New money has been found to foster high-risk, high-reward research, develop the necessary tools and methodologies, fill knowledge gaps, and change academic culture to foster collaboration. The term translational was well-chosen. Those who work at the bench and the bedside speak in separate tongues: scientists of hypotheses and mechanisms; clinicians of populations and effects. Two communities divided by uncommon language.

Startling results of such a translational effort were described in a recent paper in the *New England Journal of Medicine* (K. T. Flaherty *et al. N. Engl. J. Med.* **363,** 809–819; 2010), and on page 596 Bollag *et al.* offer more details.

In an early-phase clinical trial of a drug against melanoma, Bollag and his colleagues reduced tumours by at least 30% in 24 of the 32 patients, and made them vanish entirely in two others. Such success would be almost unthinkable at this stage of a standard clinical trial — and it was the translational approach that made the difference.

The trial was based on the discovery in 2002 that more than 60% of patients with melanoma carry a mutation in the gene that encodes the protein B-RAF. The mutation triggers a signalling pathway that accelerates cancerous cell growth. The scientists screened patients with melanoma for the B-RAF mutation and gave those who tested positive the experimental drug, which blocks the action of the mutated gene. Driven by a clear hypothesis, the approach may sound obvious to scientists, but the research that allows such a step is new. Without it, most clinical trials still use the one-size-fits-all approach that treats patients as members of a population, rather than as individuals.

Basic research is teaching us that cancer is not a homogenous disease, but is complex and heterogeneous. By taking advantage of this, other hypothesis-based trials using molecular biology to stratify patients have shown similar success. An example is work using PARP inhibitors in patients with ovarian and other types of cancer who carried mutations in the *BRCA1* or *BRCA2* genes. Opponents may argue that this early screening restricts the chances of striking lucky with a compound tested against a larger group, but the favourable results yielded by the strategy so far must see the translational trend continue to build (see page 543).

The funding of translational efforts allows scientists to see research through to the clinic.

Institutes and universities are aligning themselves with hospitals, and improved infrastructure is encouraging better communication between clinical and research scientists. Proteomics, genomics, biomarkers and high-resolution profiles of disease and stem cells all have the potential to treat disease better, and all have been pioneered by bench scientists. The funding of translational efforts now allows the same scientists to see this research through to the clinic. Over the coming years, *Nature* expects an increasing proportion of its scientific readership to engage in translational research.

Nature has already been privileged to publish some of the preclinical papers that led to successful early-phase clinical trials. And, although our pages have not been the traditional place to report the trials themselves, we recognize the growing relevance of these early-phase results to our readers. As such, we are happy to receive high-quality submissions in this area. Results from clinical trials that are biology-driven and look promising in terms of patient response could help to turn the tide against disease. The road will be long but let the optimism continue. ■

Germany rising

Twenty years after reunification, Germany is on a path to recover its former scientific glory.

Before the rise of fascism in the 1930s, Germany was a world leader in science — to the point that researchers across the globe had to learn German to follow the major scientific literature. The Germany that emerged from the Second World War, which reduced the country to ashes, was entirely stripped of its intellectual glory. It had to rebuild its infrastructure and institutions, including those for science, from scratch. Cold-war politics dictated that this would be done in two divided states. In West Germany, science was well funded and research output became modestly respectable. Over the decades, however, it became complacent, with little pressure on researchers to demonstrate their productivity, and with stifling bureaucracy that tended to crush individual dynamism. Science in communist East Germany was the pride of the Eastern Bloc, but when the Berlin Wall fell in 1989, it was exposed as lagging behind the West. Handicapped by isolation from the Western world, including its scientific publications — now almost all in English — as well as by crumbling, ill-equipped labs,