A kilometre away at the Italian senate, meanwhile, parliamentarians further eroded protection for vulnerable patients targeted by stem-cell companies. On 10 April, they amended an already controversial ministerial decree (see *Nature* **495,** 418–419; 2013) with a clause that would redefine stem-cell therapy as tissue transplantation, thereby releasing it from any regulatory oversight. If the second parliamentary chamber endorses this amendment, Italy will be out of step with the rules of the European Union and the US Food and Drug Administration, both of which define stem cells modified outside the body as medicines.

Many scientists around the world were appalled by the events in Rome, and rightly so. It is wrong to exploit the desperation of the disabled and the terminally ill and to raise false hopes of quick fixes, as some at the Vatican meeting tried to do. It is also wrong to try to use such patients as experimental animals by bypassing regulatory agencies, as the Italian parliament seems to want to do.

Reputable stem-cell companies insist that stringent regulatory control is necessary, and that patients should be exposed to experimental treatments only when safety and efficacy is assured. Failures in the clinic will hold back the field. But not all of the cell-therapy industry is so tolerant.

With their ability to differentiate into various cell types, stem cells hold enormous potential to repair damaged tissues. Human embryonic stem cells can turn into any cell type, but many groups, including the Catholic Church, find their derivation from embryos unethical.

The current controversy concerns adult stem cells. These exist in several tissues, but can replace only those particular tissues. Big claims are being made for them, with many trials of therapies under way worldwide for conditions as diverse as Alzheimer's and heart disease. Some stem-cell therapies are approved by regulatory agencies; others sneak under the radar by exploiting rules allowing compassionate therapy, for example, or by operating in countries such as China or Mexico — and perhaps now Italy — where regulation is less strict.

The scientifically naive Vatican finds the concept of adult stem cells attractive simply because embryos are not involved — yet it ignores the ethical implications of false hope.

The main organizer of last week's conference was the non-profit Stem for Life Foundation, launched by the stem-cell company NeoStem, both based in New York. The foundation says that it is in favour of strict regulation of stem-cell therapies. But its conference programme, which left no room for questions, included many speakers who clearly were not. It was framed as a fight for reason and fairness against an uncaring and intransigent scientific community.

"A lot more research into the deep biology of stem cells is needed."

Adult stem cells have already had clinical success, such as in bone-marrow transplantation for leukaemia treatment, growing new skin layers to treat burns and regenerating corneas. More ambitious hopes need to be tempered, however. Many trials involve infusing patients with mesenchymal stem cells from bone marrow, which are relatively easy to extract and grow. These can make only bone, cartilage and fat cells, but trials targeting other tissues use the rationale that other, non-stem properties of mesenchymal stem cells apply. It remains to be seen how effective these properties will be outside the normal biological home of the stem cells.

Given the burden of incurable disease, rapid bench-to-bedside translation is unquestionably crucial. But a lot more research into the deep biology of stem cells is needed. Some trials approved by regulatory agencies may yield useful results, but that is a long shot without strong research data. At least they are safer under regulatory eyes. Unregulated treatment — such as that issued on a compassionate basis by the Stamina Foundation in Brescia, Italy, which led to the current ministerial decree — is more worrying. The second parliamentary chamber needs to heed independent expert advice before voting to deregulate stem-cell therapies.

Stem cells will help to develop treatments for currently incurable diseases. But we are not there yet, whatever the smoke signals may say. ■

Due credit

Nature's podcast charts 12 landmark discoveries in the history of science.

Even the greatest scientific discoveries come with an element of the mundane. A humble paperclip was biophysicist Raymond Gosling's choice. Late one night in May 1952, in a chemistry lab in London, the PhD student wrapped DNA around a paperclip to keep the molecule's fibres stretched taut in front of an X-ray source so that he could analyse their structure. The result was the celebrated 'photograph 51' — the image that told James Watson that DNA strands curl around each other like a twisted ladder, and that the specific pairings in the rungs are key to the mechanism of inheritance.

The rest of that story is legend. Based on their work at the University of Cambridge, UK, Watson and Francis Crick published their paper in the pages of this journal, including a beautiful diagram of the double helix that was hand-drawn by Odile Crick, Francis' wife (J. D. Watson and F. H. C. Crick *Nature* **171,** 737–738; 1953).

Next week marks the 60th anniversary of the publication of the famous Watson and Crick paper — and that of two other papers on DNA that appeared in the same issue. Neither was so high profile, but each was essential to the structure's discovery. Both were written by scientists at King's College London: one by Maurice Wilkins and his colleagues Alec Stokes and Herbert Wilson, and the other by Gosling and his PhD supervisor, Rosalind Franklin.

Only Gosling (now 86) and Watson survive from that group of seven scientists. Watson has never been shy, and his compelling swagger helped to establish another colossus of biology, the Human Genome Project. But the supporting cast matters too, even on the biggest stages.

Gosling is a *Nature* author, even if he is largely forgotten when the story of DNA is told. To mark the anniversary of his paperclip-inspired contribution, *Nature* has interviewed him. You can hear the results at go.nature.com/lizfik, in the first of a series of monthly podcasts to highlight 12 key scientific discoveries from the pages of this journal. (Future episodes in the 'Pastcast' series will plunder the *Nature* archive to investigate the discovery of X-rays in 1896, the early days of quantum theory in the 1920s and the first report of the ozone hole in 1985.)

In the interview, a humble Gosling fondly recalls that Franklin's response to Crick and Watson's model of the double helix was gracious and sanguine: "She didn't use the word 'scooped'. What she actually said was, 'We all stand on each other's shoulders.'"

All three papers appeared with no peer review — unthinkable now. The head of the King's College biophysics unit, John Randall, belonged to the same London gentleman's club — the Athenaeum — as Lionel ('Jack') Brimble, co-editor of *Nature*. Randall convinced Brimble to publish Wilkins' paper alongside Watson and Crick's; Franklin's paper was added only after she petitioned for its inclusion.

This cavalier approach to submissions extended to the awarding of credit. Watson and Crick's paper features only a glancing concession to being "stimulated by a knowledge of the general nature of [Wilkins and Franklin's] unpublished experimental results and ideas". There is no mention of Gosling by name. Gosling left research soon after, with no bitterness; in his words, he "was no good at it".

Discoveries take ego, genius, conflict, inspiration and fierce ambition. But they also need the hard graft of PhD students who beaver away late into the night and improvise with what they find in the stationery cupboard. They do not always receive the recognition that they deserve. Raymond Gosling is a good place to start to reverse that trend. ■

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