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Future vision

Japan deserves praise for early success with induced pluripotent stem-cell treatments, but must still exercise caution in commercializing them.

Masayo Takahashi and Yasuo Kurimoto have done it again. Two and a half years ago, these two Japanese physicians took retinal cells derived from induced pluripotent stem (iPS) cells and successfully transplanted them into a woman who had age-related macular degeneration. It was the world's first surgical procedure using iPS cells, which can develop into any type of cell in the body, but are not as ethically fraught as stem cells from human embryos.

On 28 March, the same team carried out a procedure that sounds similar, but with an important twist. This time, the retinal repair cells were made using iPS cells from an anonymous donor.

There are many things to say about this achievement. The first is congratulations. Takahashi, an ophthalmologist at the RIKEN Center for Developmental Biology in Kobe, and Kurimoto, a surgeon at the Kobe City Medical Center General Hospital, have moved iPS-cell technology towards the clinic in the way it should be done — slowly and cautiously — and have thereby set a great precedent. They had non-human primate data, they rigorously tested cells before using them, and when they found a genetic abnormality in the first study — even though it was one that they didn't think would cause cancer — they called off the procedure and were open about the abnormality.

The cautious approach, one hopes, will prevent such trials from going off the rails (as happened, for example, with gene therapy) and so avoid blocking other iPS-cell procedures that are in the works. Researchers at Kyoto University in Japan are investigating iPS-cell-derived blood for transfusions and neurons for treating Parkinson's disease.

The second thing to say is that this is good news for all. The use of iPS cells is one more step away from the vicious debate over the use of embryonic stem (ES) cells, which has hampered stem-cell science for more than a decade, especially in the United States. Yet, of course, the debate will not go away — as argued by many scientists and in these pages, ES cells will still have their place in research, and scientists wanting to pursue such work will run into the same political roadblocks. But a path forward using tissue derived from iPS cells will put to bed sensationalized talk of farms in which embryos are created for harvesting organs.

The third thing is that this work signals a fairer distribution of medical benefits. Some had feared that iPS cells might end up as a boutique treatment for the rich. If a medical procedure required new cells to be obtained from each patient, and every procedure needed to pass through the costly and tedious process of extracting cells, reprogramming them and rigorously testing them to ensure safety, the cells would be so costly that only the very wealthy could afford them.

But if one can use cells that are in a bank (as these were), selected in such a way as to be a good immunological match for large swathes of the population and paid for by the government, costs can be slashed and more people can benefit. And banked cells will be immediately available — a great boon for situations such as spinal-cord damage, in

which scientists think that starting repair work with stem cells needs to be done soon after the damage to have the greatest chance of success.

The fourth thing to say is that Japan should not get carried away. So far, Takahashi has moved slowly. But Japan has a fast track in place to open the door to clinical commercialization without sufficient testing for efficacy. Determining whether a treatment is ready for mass commercial use should be based on a careful weighing up of risks and

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benefits. No matter how carefully risks are assessed, they are an inherent part of such a procedure, and include surgical mishaps, unknown and unpredictable chances of mutation and the danger of missing more-effective alternatives.

To know that the procedure is worth it, one must analyse the benefits and not just show it is safe. In Japan's fast-track process, weighing up the benefit — the efficacy of the procedure — will be left to studies done after the treatment has been commercialized. But there are reasons — such as the lack of standardized protocols between hospitals, the lack of a control group (and the lack of anything to be gained by carrying out such rigorous reporting) — that raises questions of whether efficacy would ever be assessed.

Under the fast-track system, demonstration of safety in a half-dozen patients could be enough to get a treatment on the market. Takahashi and Kurimoto's current trial is only a safety 'clinical study'. It does not count towards the 'clinical trial' fast track. But that is the long-term goal. The project leaders of the current study, and those who will be following in their path, must move with the same care and caution when iPS-cell procedures start entering the clinical-trial stage. ■

Under the cover

A study of reading habits reveals political divisions in scientific interests.

Mark Twain said an ideal life was good friends, good books and a sleepy conscience. But what if those good friends all read the same good books? And share the same dozy reluctance to examine their motives and values? That sounds far from ideal: it sounds instead like a group of people who would reinforce each other's prejudices, resist external challenges and increasingly see the world as they want it to be, rather than how it is. It sounds, in other words, like the instructions for building an echo chamber — a social phenomenon that is increasingly common in online communication,

in which connected people prioritize shared ideology and politics over facts and evidence.

Twain's own ideology and politics have proved notoriously difficult to pin down. He is regularly claimed as a hero and figurehead by both liberals and conservatives, which makes him unusual — because, as an analysis shows this week (F. Shi *et al. Nature Hum. Behav.* 1, 0079; 2017), common ground between the two positions seems increasingly scarce.

If you live in the United States and buy books online, then this analysis could be about you. Especially if you bought Barack Obama's *Dreams from My Father* (Times, 1995) or Mitt Romney's *No Apology* (St Martin's, 2010) from Amazon or Barnes and Noble. If you did, then you may have been labelled as a liberal or conservative, your other book purchases may have been checked, sifted and classified, and the results could be buried in the massive data set described in *Nature Human Behaviour*. (Don't worry if you did — the results are anonymous.)

Taking advantage of the 'customers who bought this item also bought' feature of online commerce, the researchers constructed a co-purchase network of political books and science books. And they found a clear division, which they label "partisan differences in the consumption of science".

Both groups bought science books — more than 400,000 between them. But it was relatively unusual to find books that appealed to both liberals and conservatives. Members of each group — and their good friends — had different ideas about what made a good book. Buyers of "blue books" (the liberals) tended to pick from basic science topics, including physics, astronomy and zoology. "Red" customers preferred books that discussed applied and commercial science, such as medicine, criminology and geophysics. And whereas liberal

choices tended to reflect mainstream thinking, "red books" tended to be co-purchased with a narrower subset of science books on the fringes of each subject.

It's not just purchases of science books that can be analysed in this way. The researchers have a website (lifestyle-politics.com) on which they use information from Twitter followers of politicians to build similar profiles of how liberals or conservatives tend to group around certain

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comedians, actors, makes of car, airlines and other everyday preferences. Sport, for example, sees liberals associate with brands that are connected to outdoor adventurous pursuits such as hiking and mountaineering, whereas the conservative right is more at home with companies that make golf clubs.

The results might seem obvious, but such studies come with a couple of major advantages. The first is the massive quantity of available online data, which — subject to proper safeguards — offers rich potential for social scientists and others. The second, as the researchers point out, is that the data on tastes, preferences and behaviour are probably more useful and reliable than surveys: "Surveys measure what researchers think is important, not what respondents care about." And with people's choices of reading material still judged by some as denoting an alert or sleepy conscience, surveys are vulnerable to people being reluctant to reveal tastes that could be considered politically incorrect. Books purchased online, as the study points out, come "cloaked in cardboard". Social groups, especially on the Internet, are going the same way — and discovering a way to peek inside and find common ground is a defining challenge of the age. ■

Not English

Brexit poses a linguistic problem and forces decisions on agency locations.

Now that the Brexit process is officially under way, officials must decide where to rehouse the European Medicines Agency (EMA). Currently in London, the EMA assesses new medicines for suitability to enter the European market.

The regulator will need to move when the United Kingdom formally exits the European Union, which sets the rules and assessments that the agency enforces.

The relocation decision will be made by the European Council, and more than a dozen nations have expressed an interest in becoming the new host. The timescale of the process is uncertain, but at least one of the candidate nations — Malta — has an interest in a final call being made sooner rather than later because it holds the presidency of the European Council for the next three months.

There is more at stake than the prestige of being the headquarters of a major European institution. Local economies gain too. The EMA brings with it some 900 staff and holds an average of 10 meetings a week, which it claims draw 65,000 visitors a year, all of whom need somewhere to sleep and eat.

Malta — a tiny island in the Mediterranean Sea — knows that it's a rank outsider in the bidding process. But, as officials of the Malta Medicines Agency pointed out at a meeting last September, it does have a few things going for it. One is the weather. Another, according to its own analysis, is reduced commuting time for employees. (How far away can they live on an island of barely 300 square kilometres?) More intriguingly, Malta points out that another benefit is that one of its official languages is English — the lingua franca of science, law and business in the EU.

By a curious quirk of paperwork, when the United Kingdom

does leave the EU, the most widely spoken language across the bloc — English — will no longer be a nominated official language. Under EU rules, every member state is allowed to bring just one of its recognized national languages into the EU system. This guarantees, for example, translations of documents and decisions.

Under the existing arrangement, the United Kingdom currently nominates English, which leaves Ireland and Malta (the only other member states to have English as a formal national language) free to have Gaelic and Maltese as their choices. (Ireland has also offered to host the EMA.) Once the United Kingdom leaves, it takes with it the formal nomination for the EU to include English in its list of official voices.

Various EU officials have already made it clear that the English language will not be allowed to exit the EU along with its main speakers on the continent — chaos would surely follow if, for example, the English-speaking EMA was expected to work with documents in every language but English. But the political mechanism to secure a future for English — like much associated with Brexit — is contested and unclear.

As international researchers point out in a paper in *European Economic Review*, there are three possible routes (V. Ginsburgh *et al. Eur. Econ. Rev.* 93, 139–151; 2017). The first is that the European Council votes to keep English even without an official nomination from a member state. This would require the approval of Germany and France, and the latter, especially, might be especially unwilling to offer it. Many French scholars still smart at English's rise to dominance in intellectual fields.

Another option is special permission for Ireland or Malta to nominate a second official language. But that would build pressure from other countries and regions to also have additional languages accepted. More than three million people in Spain speak Galician, and more than six million speak Catalan — greater than the populations of Ireland and Malta combined.

The simplest solution might simply be to ask Ireland or Malta to switch their official nomination to English. Local opposition in both cases could make that a hard sell for their respective governments. Now what could the EU — looking for a home for the EMA — possibly offer in return? ■