Concussion drug hope as scientists show brain damage can be reversed

Tom Whipple Science Editor

When mice are hit hard on the head they react much like humans. They have trouble forming new memories, their personality can change, they may become aggressive or confused and they find it difficult navigating in new surroundings. Almost nothing, it had been believed, could be done.

But in a California laboratory scientists have given brain-damaged mice a drug and found that the animals could then navigate a maze just as well as their healthy peers. In doing so the scientists have shown that it may be possible to reverse the effects of apparently permanent brain injury.

Theirs is not the only research and there is hope of creating a "concussion pill" to help the estimated 350,000 Britons a year who suffer a brain injury.

In the US, a company called Pro-IV claims to have a drip that can mitigate the effects of recent concussion in contact sports. A Harvard team is working on an antibody treatment to prevent some of the damage that occurs immediately after impact.

The latest research, published in the journal *Proceedings of the National Academy of Sciences*, goes further. Rather than immediately after a head injury, the mice received the drug a month later. Peter Walker, from the University of California, San Francisco, said that the results were "amazing". "We can flick a reset button and make their behaviour indistinguishable from uninjured animals," he said. "Normally people would have... assumed they were permanently demented."

He believes the work, conducted with his colleague Susanna Rosi, shows that a head injury locks the brain into a stress response, shutting down undamaged cells. "They sense something is wrong, and just slow things down," he said. In the past this may have been useful. "When you are hit on the brain and have trauma you probably don't want to go out and hunt a tiger. You want to be a bit more sedate until your capacities are back." Sometimes, however, the brain never speeds up again. He thinks the molecule he and his colleagues discovered, called Isrib, "breaks this response — it releases the brain."

A lot of research is looking into brain injury, particularly in sport, where there is evidence that the accumulation of mild concussions can have devastating long-term effects.

Hannah Wilson, of the Drake Foundation, which studies sports concussion, cautioned that work on Isrib is at an early stage and only in animals.

Other scientists believe just the proof of principle is cause for excitement. "Traumatic brain injury has historically been a bit of a neglected stepchild," said Ramon Diaz-Arrastia, of the University of Pennsylvania. "But this has a very high cost for society — trying to rehabilitate people who are disabled and are often so badly off they are unable to work costs a lot of money. We have no therapies that are really useful in this rehabilitation phase, so this is potentially revolutionary."

Times 11.9.2017