range of effects, including paralysis, slurred speak and muscle weakness. While much of the work in this area of research has focussed on the spinal cord and white matter of the central nervous system, our understanding of the changes that occur in the neuron-rich grey matter is limited. Vincenzo De Paola and colleagues use time-lapse microscopy to monitor the response of neuronal circuits in the injured brains of living mice over the course of a year. They find that specific types of nerve fibres can spontaneously regrow over distances that are not normally seen in the uninjured brain and that this is in part, due to an absence of nearby glial scars that secrete inhibitory growth factors.
Although the authors acknowledge that they do not fully understand the mechanisms of axon regeneration in the mammalian brain, they hope that these microscopic approaches will be useful for testing repair strategies in ways not previously possible.

***In-vivo* single neuron axotomy triggers axon regeneration to restore synaptic density in specific cortical circuits**

A. J. Canty, L. Huang, J. S. Jackson, G. E. Little, G. Knott, B. Maco, V. De Paola
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Abstract | Full text | PDF

***And finally*...Cancer: FAK to the drawing board?**

Combating cancer by inhibiting the protein focal adhesion kinase (FAK) may not be as straight forward as previously thought, a study published in *Nature Communications* suggests. FAK inhibitors, used at high doses have been shown remarkable efficacy in controlling cancer. However, the work here shows that the biological role of FAK in cancer progression is complex, and partial inhibition of the enzyme could enhance, rather than decrease, tumour growth.
FAK is expressed in most cells of the body and regulates a range of physiological processes, including the formation of new blood vessels – a process known as angiogenesis. Because tumours depend on angiogenesis to ensure nutrient supply for their continued growth, FAK inhibitors are currently being developed as anti-cancer drugs. Vassiliki Kostourou and colleagues engineered mice that produce low levels of FAK and show that tumours in these mice, paradoxically, grow larger and have more new blood vessels than normal mice. The same situation also arises in normal mice treated with low doses of a FAK inhibitor. This demonstrates a contrast to the assumption that FAK inhibition generally slows down tumour growth, which motivates the development of FAK inhibitors as anti-cancer drugs.
The findings suggest that high doses of FAK inhibitors, which ensure complete inhibition of the enzyme, might be required to achieve therapeutic success.

FAK-heterozygous mice display enhanced tumour angiogenesis

Vassiliki Kostourou, Tanguy Lechertier, Louise E. Reynolds, Delphine M. Lees, Marianne Baker, Dylan T. Jones, Bernardo Tavora, Antoine R. Ramjaun, Graeme M. Birdsey, Stephen D. Robinson, Maddy Parsons, Anna M. Randi, Ian R. Hart, Kairbaan Hodivala-Dilke
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Neuroscience: Seeing the light with visual prostheses

Rats with prosthetic retinal implants display visual responses to light, a study in this week's *Nature*