

› NEWS UPDATES

Scratching the surface of the itch

The phenomenon of itch is poorly understood, and to date, scientists have been able to define the sensation only by the response it elicits: an urge to scratch. Although scratching does relieve most itches, chronic itch caused by skin disease or neurological malfunction can lead patients to scratch incessantly, which can worsen the itch and eventually result in severe injury. A better understanding of the relationship between scratching and itching may enable scientists to develop treatment for chronic itch.

Glenn Giesler and colleagues (University of Minnesota, Minneapolis) explored the mechanisms of scratching in cynomolgus macaques (*Nat. Neurosci.* **12**, 545–546; 2009). They focused on spinothalamic tract neurons, which are located in the spinal cord and are thought to transmit itching sensations to the brain. The researchers first determined which areas of a macaque's skin were associated with specific neurons and then injected histamine, an itch-inducing substance, into those areas. The histamine injection activated certain neurons, and when an experimenter scratched the sensitive skin immediately after the injection, those neurons stopped firing. The neurons were reactivated once scratching ceased. Scratching did not affect those same neurons' responses to other stimuli such as pain induced by application of capsaicin.

Fish feel and fear pain

The question of whether fish feel pain has been debated for years. Fish lack specific brain regions that are considered necessary for the conscious perception of pain, and they seem to show little response to potentially debilitating procedures such as having hooks inserted through their mouths. Some noxious stimuli, however, do produce clear aversive reactions in fish. It remains a challenge to evaluate which procedures are potentially painful in fish and to determine whether analgesics are effective.

Janicke Nordgreen (Norwegian School of Veterinary Science, Oslo) and colleagues attempted to assess analgesic efficacy in goldfish by exposing them to water at different temperatures (*Appl. Anim. Behav. Sci.*, published online 18 April 2009; doi:10.1016/j.applanim.2009.03.015). Fish try to escape water that is too warm, and the researchers hypothesized that goldfish treated with the analgesic morphine would be able to withstand higher temperatures than would fish treated with saline only. All fish showed an escape response at similar temperatures, seemingly refuting the hypothesis. In their home tanks, however, morphine-treated fish swam normally, whereas saline-treated fish tended to hover in one place, an anxiety-like behavior. These findings suggest that although all fish reacted reflexively to the noxious stimulus of heat, saline-treated fish 'experienced' the pain, whereas morphine-treated fish did not.

More funding for large animal research

Scientists are calling attention to the lack of funding for large animal studies in the US and warning that it may compromise both biomedical and agricultural research.

The group, led by James Ireland at Michigan State University (East Lansing), pointed out the disparity in total funding for research grants focused on animal agriculture versus human health. Only about 0.04% of the USDA's \$88 billion budget in 2007 was designated for research on agriculturally important domestic animals, whereas the NIH received 4.1% of the Department of Health and Human Services' \$716 billion budget in 2008; 80% of the allocated amount supported extramural research (*Science* **324**, 468–469; 2009). Although private sources do fund agricultural studies, they favor commercial interests over essential basic research.

Ireland's commentary contends that large animal studies are essential not only to agricultural advances but also to biomedical research: 17 Nobel Prize winners used large animals as research models, and farm animals are arguably the best models we have for research on obesity, aging, reproduction, genomics and cardiovascular disorders. Ireland's group calls for greater federal funding for large animal research and more emphasis on integrating agricultural programs with the broader biomedical research community.