Medical Xpress

Fearless fish forget their phobias

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Imagine if your fear of spiders, heights or flying could be cured with a simple injection. Research published in BioMed Central's open access journal, *Behavioral and Brain Functions* suggests that one day this could be a reality.

The cerebellum, an area of the brain thought to be involved with the development of our fears, was studied in goldfish by researchers at the University of Hiroshima in Japan.

Using classical conditioning, Masayuki Yoshida and Ruriko Hirano taught their fish to become afraid of a light flashed in their eyes. By administering a low voltage electric shock every time a light was shone, the fish were taught to associate the light with being shocked, which slowed their hearts - the typical fish reaction to a fright.

Yoshida explains, "As you would expect, the goldfish we used in our study soon became afraid of the flash of light because, whether or not we actually gave them a shock, they had quickly learned to expect one. Fear was demonstrated by their heart beats decreasing, in a similar way to how our heart rate increases when someone gives us a fright".

Humans can also be 'trained' to become afraid, and in fact, simple classical conditioning rooted in our childhood and early development can explain many of our behaviours. In this study however, the team discovered that fish that had first been injected in the cerebellum with lidocaine had stable heart rates and showed no fear when the light was shone - they were unable to learn to become afraid.

Since the brains of goldfish show many similarities with those of mammals, including humans, it is hoped that with further study it may soon be possible to understand more about the biological and chemical processes that cause us to become afraid. For the goldfish, the effect of lidocaine is only temporary - fearless fish return to being frightened fish as soon as the anaesthetic has worn off. Nevertheless, one day, our irrational phobias could become a thing of the past.

More information: Effects of local anesthesia of the cerebellum on classical fear conditioning in goldfish, Masayuki Yoshida and Ruriko Hirano, *Behavioral and Brain Functions* (in press), www.behavioralandbrainfunctions.com/

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