

## **Research shows brain's ability to overcome pain and thirst**

Researchers at Melbourne's Howard Florey Institute have discovered how the brain prioritises pain and thirst in order to survive - a mechanism that helps elite athletes to 'push through the pain barrier'.

The Florey's Dr Michael Farrell and colleagues discovered that pain sensitivity is enhanced when people are thirsty.

The scientists also found that a part of the brain is uniquely activated when pain and thirst are experienced together, suggesting these regions may act as an integrative centre that has a special role in modifying pain senses.

Dr Farrell used PET (Positron Emission Tomography) scans to examine changes in brain activity. The 10 individuals participating in the study were given saline injections to stimulate mild thirst and thumb pressure to induce mild pain. Although the level of thumb pressure remained constant throughout the tests, as people became thirstier, they felt more pain.

Dr Farrell said the regions of the brain (the pregenual cingulate cortex and ventral orbitofrontal cortex) activated together during thirst and pain acted like a priority switch.

"Depending on internal demands being placed on the body, the brain needs to decide which demand is more important to respond to in order to survive," he said.

"Many elite athletes have an ability to balance their priority switch longer than most people so they can push through normal thresholds of pain and thirst whilst competing."

"But when the internal demands become extreme and the body's physiology is too perturbed, the brain will tell the body 'enough is enough,'" Dr Farrell said.

The brain's ability to overcome pain and thirst is witnessed in a soon-to-be released IMAX film: *Wired to Win: Surviving the Tour De France*. This film shows how the human brain allows elite athletes to compete and push themselves to a limit beyond our imagination.

The Howard Florey Institute, with the generous support of IMAX, is holding a free special screening of the new IMAX movie, *Wired to Win* at 6:30pm on 28 February. This event is open to the public, but seats are strictly limited. Contact Sanam Sharma on email: [wiredtowin@hfi.unimelb.edu.au](mailto:wiredtowin@hfi.unimelb.edu.au) or phone: (03) 8344 1642 to secure your ticket.

This research paper, "Unique, common and interacting cortical correlates of thirst and pain" was prepared by Michael J. Farrell (Howard Florey Institute), Gary F. Egan (Howard Florey Institute), Frank Zamarripa (Research Imaging Center, San Antonio, Texas), Robert Shade (South West Foundation for

Biomedical Research, San Antonio, Texas), John Blair-West (University of Melbourne), Peter Fox (Research Imaging Center, San Antonio, Texas), and Derek A. Denton (University of Melbourne). It was published today in Proceedings of the National Academy of Sciences.

The Howard Florey Institute is Australia's leading brain research centre. Its scientists undertake clinical and applied research that can be developed into treatments to combat brain disorders, and new medical practices. Their discoveries will improve the lives of those directly, and indirectly, affected by brain and mind disorders in Australia, and around the world. The Florey's research areas cover a variety of brain and mind disorders including Parkinson's disease, stroke, motor neuron disease, addiction, epilepsy, multiple sclerosis, muscular dystrophy, autism and dementia.

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For more information contact:  
Merrin Rafferty  
Public Relations and Development Manager  
Howard Florey Institute  
Ph: (03) 8344 1658 M: 0400 829 601  
Email: [m.rafferty@hfi.unimelb.edu.au](mailto:m.rafferty@hfi.unimelb.edu.au)  
Web: [www.hfi.unimelb.edu.au](http://www.hfi.unimelb.edu.au)