

Double-barreled attack on obesity in no way a no-brainer

July 9 2013



This shows Drs Shu Lin and Yan-Chuan Shi. Credit: Garvan Institute of Medical Research

In the constant cross talk between our brain and our gut, two gut hormones are already known to tell the brain when we have had enough to eat. New research suggests that boosting levels of these hormones simultaneously may be an effective new weapon in the fight against obesity.

Dr Shu Lin, Dr Yan-Chuan Shi and Professor Herbert Herzog, from Sydney's Garvan Institute of Medical Research, have shown that when mice are injected with PYY3-36 and PP, they eat less, gain less fat, and tend not to develop insulin-resistance, a precursor to diabetes. At the

same time, the researchers have shown that the hormones stimulate different nerve pathways, ultimately, however, affecting complementary [brain regions](#). Their findings are now published online in the journal *Obesity*.

While the double-barreled approach may seem like a no-brainer, the strongly enhanced effect seen was by no means inevitable. In the complex world of neuroscience, two plus two does not always make four.

Drug companies are in the process of conducting pre-clinical trials to examine the separate effects of boosting the hormones PYY3-36 and PP. Until now, there is no research to indicate the detailed [molecular interactions](#) that might occur when they are boosted in tandem.

When used together, the hormones independently, yet with combined force, reduce the amount of neuropeptide Y (NPY) produced by the brain, a powerful [neurotransmitter](#) that affects a variety of things including appetite, mood, [heart rate](#), temperature and energy levels.

Each hormone also communicates with a different part of the arcuate nucleus in the hypothalamus, a region of the brain where signals can cross the normally impermeable blood / brain barrier. The stimulated regions then produce other neuronal signals deep within the [hypothalamus](#), bringing about a powerful combined effect.

"There are many factors that influence [appetite control](#) – and we now realise that there won't be a single molecular target, or a single drug, that will be effective," said Dr Yan-Chuan Shi.

"It will be important for drug companies to try different combinations of targets, to see which combinations are most potent, and at the same time have no side effects, or at least minimal side effects."

"At the moment, the only effective tool against obesity is surgery. Drug companies have so far failed to produce an effective drug without unacceptable side effects, such as mood disorders, nausea or cardiovascular problems."

Provided by Garvan Institute of Medical Research

Citation: Double-barreled attack on obesity in no way a no-brainer (2013, July 9) retrieved 23 April 2024 from

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