Chronic stress and obesity: the leptin link

FX Medicine

3 IN 5 Australian adults are **OVERWEIGHT OR OBESE**
>12 MILLION PEOPLE[1]

LIFE EXPECTANCY of an **OBESE** adult is **2-4 YEARS LESS** than those with a healthy weight[2]

STRESS CAN INCREASE THE RISK OF BEING **ABOVE HEALTHY WEIGHT**[3]

Australians with OBESITY are MORE LIKELY to report that **STRESS IMPACTS ON THEIR PHYSICAL HEALTH** than non-obese Australians[2]

WHAT IS LEPTIN?[5-7]

Leptin is a hormone vital in the regulation of appetite, food intake and weight.

Leptin acts on specific receptors in the hypothalamus to inhibit appetite through both counteractive and stimulatory mechanisms:

- Leptin counteracts the effects of a feeding stimulant released in the gut called neuropeptide Y (NPY), which stimulates appetite.
- Leptin also promotes the synthesis of an appetite suppressant called melanocyte-stimulating hormone (MSH).

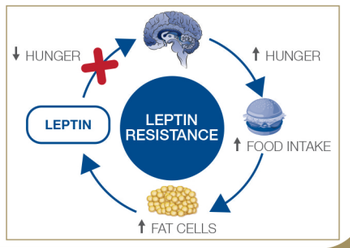
The majority of leptin is produced in white fat deposits in the body and leptin levels are directly associated with total amounts of fat in the body.

When fat mass decreases, the level of plasma leptin falls so that appetite is stimulated until the fat mass is recovered. There is also a decrease in body temperature and energy expenditure is suppressed.

By contrast, when fat mass increases so do leptin levels and appetite is suppressed until weight loss occurs. In this way, leptin regulates energy intake and fat stores so that weight is maintained within a relatively narrow range.

LEPTIN RESISTANCE

Many obese humans have been shown to have high amounts of leptin circulating in the blood which does not seem to affect appetite or energy expenditure. This is termed "leptin resistance" and commonly happens in overweight and obese people, making it even harder for them to control their appetite and weight gain.



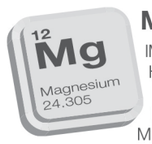
HERBAL AND NUTRITIONAL INTERVENTIONS[12-15]

RHODIOLA

(*Rhodiola rosea*)

ANTI-INFLAMMATORY, REDUCES CORTISOL LEVELS, IMPROVES INSULIN SENSITIVITY, ANTIOXIDANT, REDUCES VISCERAL ADIPOSE TISSUE

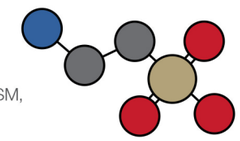
MAGNESIUM



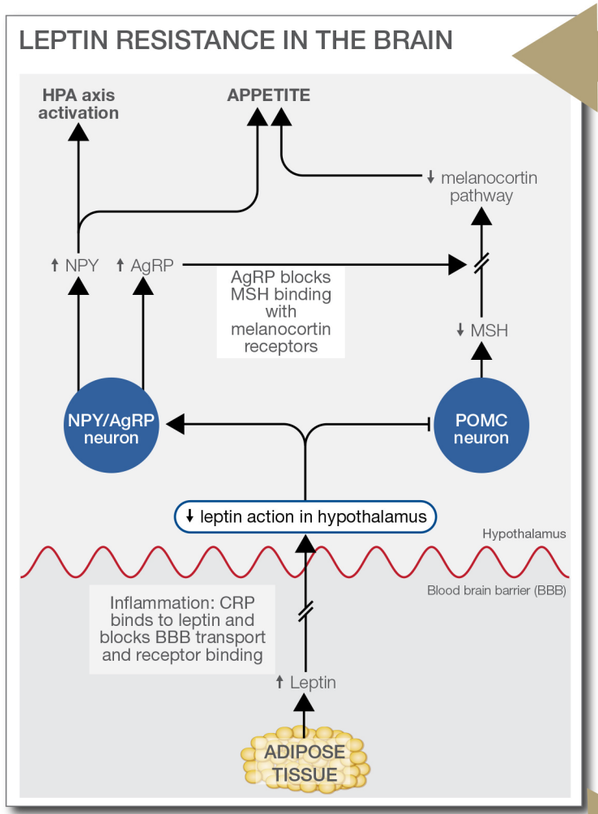
IMPROVES INSULIN SENSITIVITY, IMPROVES HYPOTHALAMIC SENSITIVITY TO LEPTIN, DEPLETED BY INCREASED SERUM LEPTIN, DEPLETED BY STRESS, IMPROVES NEUROTRANSMITTER FUNCTION, MEMBRANE STABILISER

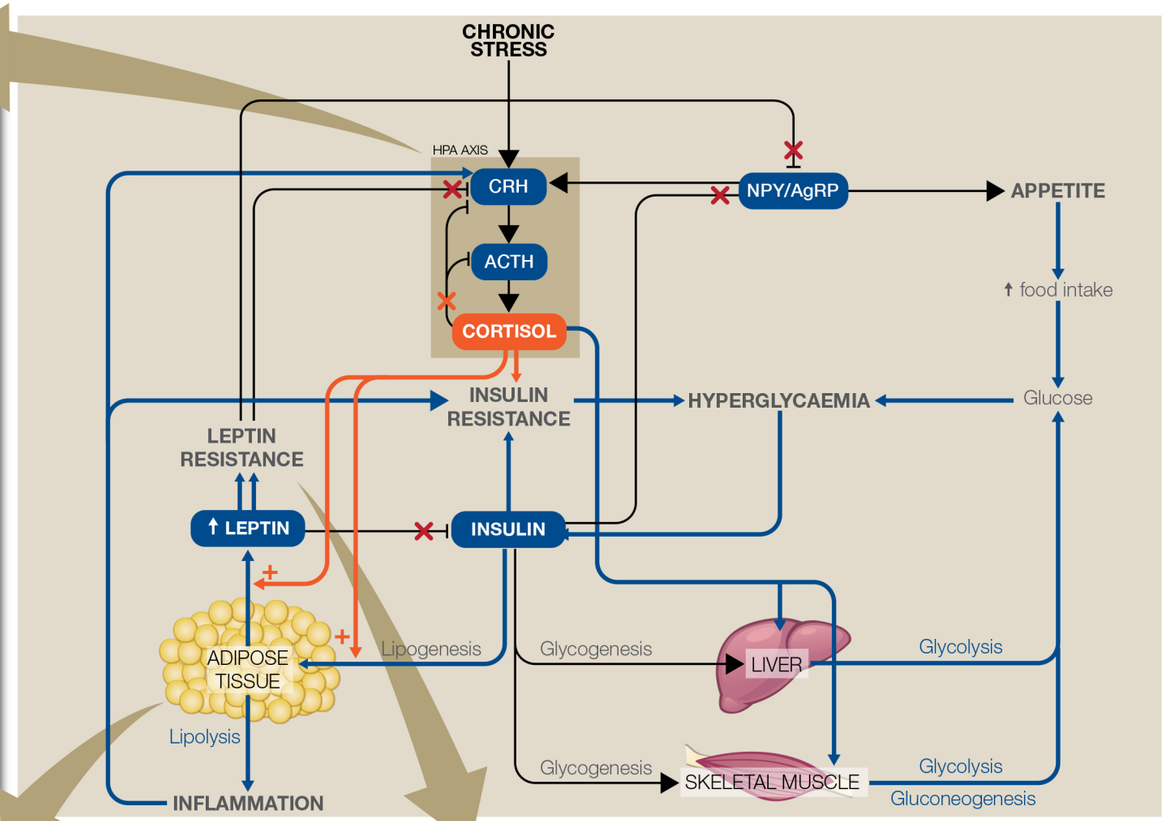
TAURINE

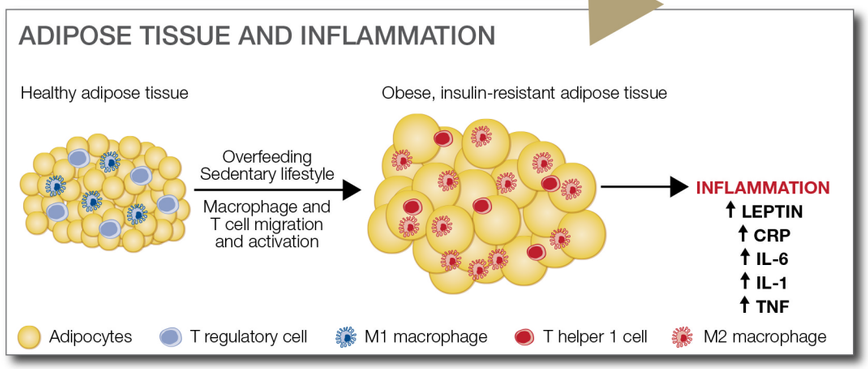
DEFICIENCY ASSOCIATED WITH PANCREATIC BETA-CELL DYSFUNCTION, IMPROVES INSULIN SENSITIVITY, LEPTIN MODULATOR, IMPROVES LIPID METABOLISM, MEMBRANE STABILISER, INHIBITORY NEUROTRANSMITTER, ANTIOXIDANT

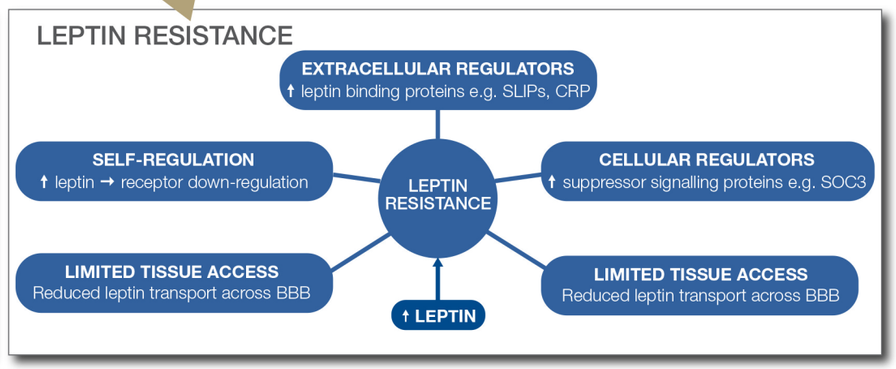


LEPTIN AND THE HYPOTHALAMIC-PITUITARY-ADRENAL AXIS[5-11]









CRH: corticotropin releasing hormone; ACTH: adrenocorticotropin releasing hormone; NPY: neuropeptide Y; AgRP: Agouti-related peptide; MSH: melanocyte stimulating hormone; POMC: pro-opiomelanocortin; IL: interleukin; TNF: tumour necrosis factor; HPA: hypothalamic-pituitary-adrenal; CRP: C-reactive protein; BBB: blood brain barrier; SOC3: suppressor-of cytokine-signalling-3; SLIPs: serum leptin-interacting proteins