INFLAMMATION

Intestinal-type alkaline phosphatase —a new therapeutic weapon?

The anti-inflammatory enzyme intestinal-type alkaline phosphatase (IAP) might become a new weapon in the fight against the metabolic syndrome, suggest recent experiments in mice.

Over the past decade, low-grade systemic inflammation has been shown to play a critical part in the pathogenesis of the metabolic syndrome. Abnormal composition of the gut microbiota causes obesity, and microbial dysbiosis can be prevented by IAP. Moreover, mildly increased levels of bacterial lipopolysaccharides in blood (metabolic endotoxaemia) cause obesity and insulin resistance. These findings prompted Madhu S. Malo (Massachusetts General Hospital, Harvard Medical School) and co-workers to investigate the effects of endogenous IAP, as well as IAP supplements, on the metabolic syndrome.

The researchers fed mice a high-fat diet (45% kcal from fat) in the presence or absence of IAP in the drinking

water. “We found that IAP prevented glucose intolerance, hyperinsulinaemia, dyslipidaemia and fatty liver,” says Malo. Interestingly, IAP dramatically increased HDL cholesterol but greatly reduced LDL cholesterol levels in animals fed a high-fat diet. In mice with established metabolic syndrome, 6 weeks of IAP treatment corrected glucose intolerance and hyperinsulinaemia.

“To our surprise, even mice on a low-fat diet receiving IAP had a dramatic decrease in LDL cholesterol and increase in HDL cholesterol levels,” comments Malo. He also highlights the potential of an IAP-based therapy, for example, as a drug or food supplement, to prevent or treat the metabolic syndrome in humans.

Linda Koch

Original article Kaliannan, K. *et al.* Intestinal alkaline phosphatase prevents metabolic syndrome in mice. *Proc. Natl Acad. Sci. USA* doi:10.1073/pnas.1220180110