

Nano-sized 'trojan horse' to aid nutrition

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Researchers from Monash University have designed a nano-sized "trojan horse" particle to ensure healing antioxidants can be better absorbed by the human body.

Dr Ken Ng and Dr Ian Larson from the University's Faculty of Pharmacy and Pharmaceutical Sciences have designed a nanoparticle, one thousandth the thickness of a human hair, that protects antioxidants from being destroyed in the gut and ensures a better chance of them being absorbed in the digestive tract.

Antioxidants are known to neutralise the harmful effect of free radicals and other reactive chemical species that are constantly generated by our body and are thought to promote better health.

Normally our body's own antioxidant defence is sufficient, but in high-risk individuals, such as those with a poor diet or those at risk of developing atherosclerosis, diabetes or Alzheimer's disease, a nutritional source of antioxidants is required.

Dr Larson said orally delivered antioxidants were easily destroyed by acids and enzymes in the human body, with only a small percentage of what is consumed actually being absorbed.

The solution is to design a tiny sponge-like chitosan biopolymeric nanoparticle as a protective vehicle for antioxidants. Chitosan is a natural substance found in crab shells.

"Antioxidants sit within this tiny trojan horse, protecting it from attack from digestive juices in the stomach," Dr Larson said.

"Once in the small intestine the nanoparticle gets sticky and bonds to the intestinal wall. It then leaks its contents directly into the intestinal cells, which allows them to be absorbed directly into the blood stream.

"We hope that by mastering this technique, drugs and supplements also vulnerable to the digestive process can be better absorbed by the human body."

The research project will proceed to trials early in 2009.

Dr Ng said although the research was still in its early stages, the longer term aim of the project would be to include similarly treated nanoparticles into food items, similar to adding Omega-3 to bread or milk.

"For catechins – the class of antioxidants under examination and among the most potent dietary antioxidants -- only between 0.1 and 1.1 per cent of the amount consumed makes it into our blood. If we can improve that rate, the benefits are enormous."

Source: Monash University

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