It's never too late to get it back! Aging interrupted

April 2 2007

Much research has shown that reduced calorie intake can increase health and longevity. Professor Stephen Spindler (University of California) and his collaborators* have discovered that reducing calorie intake later in life can still induce many of the health and longevity benefits of life-long calorie reduction. Importantly, this also includes anti-cancer effects. They are using this knowledge to establish a novel screening technique to find drugs which mimic this longevity effect.

“Right now, there are no authentic “anti-ageing drugs” capable of extending the lifespan of healthy people. The technique we have developed allows us to screen a relatively large number of drugs in months rather than years. The hope is that these drugs will be able to extend the lifespan of healthy animals, and possibly, after further testing, healthy humans”, says Professor Spindler who will present his results at the Society for Experimental Biology’s Main Meeting in Glasgow on Monday 2nd April.

Previous research has shown that mice can live up to 40% longer if they simply consume fewer calories, but a highly nutritious diet. Because people are not very good at dieting, Dr. Spindler and his colleagues would like to identify drugs which can produce the same beneficial health and longevity effects without the low calorie diet. The problem is to find a way to rapidly identify these drugs. Professor Spindler and his colleagues are examining the gene expression patterns which are induced by low calorie diets, and looking for drugs which mimic these changes. They are searching for drugs which will have these beneficial effects and

slow ageing, even when they are given late in life. One drug, normally used to treat diabetic patients, seems to produce many of the beneficial effects of a low calorie diet. However, it is important to be sure that healthy people will benefit from the drug. A very low level of toxicity could interfere with the beneficial effects of such a drug, if it is taken for a lifetime.

Physiological changes associated with ageing include cell damage and the emergence of cancer cells. The most important effects of low calorie diets and longevity therapeutics given late in life may not be to prevent this damage, but instead to stimulate the body to eliminate damaged cells that may become cancerous, and to stimulate repair in damaged cells like neurons and heart cells. Low calorie diets drive the body to replace and repair damaged cells. This process usually slows down as we age, but low calorie diets make the body re-synthesise and turn over more cells – a situation associated with youth and good health. Dr. Spindler and his colleagues used their screening method to search for drugs which cause pre-cancerous and cancerous cells to commit suicide and to replace those cells with new, healthy cells. It is thought that the body does this because it normally kills some cells like damaged and rogue cancer cells to provide energy when it is starving. Then it replaces these cells when a meal is eaten.

It seems it is the total number of calories which are consumed, rather than the type of food which is the key to the effects of low calorie diets on the ageing process. However, it is known that vegetarians and fish eaters live longer than red meat eaters, and that, generally, the more fruit and vegetables in the diet, the better your health and longer your lifespan.

Source: Society for Experimental Biology