

EDITORIAL

A LITTLE BIT OF EXERCISE GOES A LONG WAY TOWARDS SAVING YOUR MONEY

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Latest research being carried out in the field of exercise physiology is defining the physiological pathways through which physical activity may exert its beneficial effects. One of the candidates is a recently discovered myokine, Irisin, which is released from the exercising skeletal muscles into the general circulation. Irisin has been shown to influence white adipose tissue to convert into brown, which is metabolically more active and burns more calories. It also promotes bone cell differentiation from stem cells and may be one of the factors behind stronger bones in athletes. Researchers have also noted its ability to enhance Ca^{+2} levels in myocardial cells, thus increasing force of contraction. In addition, research has recently shown that exercise induced increase in epinephrine causes increase in IL-6, natural killer cells and increased infiltration of NK cells in the cancer lesions.

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We live in interesting times!

At the dawn of 21st century, while astronomers are discovering new galaxies awash in dark matter and physicists talk excitedly about “God particle” Higgs boson as the protons smash at the Large Hadron Collider, closer to earth, physiologists are busy unraveling the mysteries of the human body. Painstakingly, piece by piece, the jigsaw puzzle of human physiology is falling into place, one tiny facet at a time. And one of the areas coming into sharper focus with each new study is that of exercise physiology.

Health professionals have been warning for a long time that modern sedentary life style is bad for the physical and mental wellbeing of the man.¹ Physicians have always known that maxim “use it or lose it” is true for both physical and mental faculties. According to a study published in July, poor physical fitness may be second only to smoking as a risk factor for premature death and the risk rises by 42 percent if people are of shape.² While the type of exercise required is only moderate, 30 minutes a day 5 days a week, the potential costs of not doing that is about 2,500 \$ annually in health care spending according to a study published in The Lancet in 2016.³ How does this modest amount of activity protect the body? The researchers may have found the answer.

Irisin, an exercise induced hormone (also known as FNDC5) released from skeletal muscles, was first reported by Bruce Spiegelman, a cell biologist at Dana-Farber Cancer Institute at Harvard Medical School in 2012.⁴ This myokine was termed irisin by him, in reference to the Greek mythological goddess Iris (the messenger of the gods).⁵ It was shown that even mild elevations of iris activated the conversion of white fat into brown fat, which continues to burn energy after you finish exercising, causing increased energy expenditure and reducing obesity.⁶ Not only that, but it also appears to prevent the formation of adipose tissue,

instead activating bone cell formation, and formation of stronger bones, as was shown in a very interesting study carried out in the University of Florida and published in American Journal of Physiology - Endocrinology and Metabolism.⁷ We have always been told that exercise is good for our heart and in 2015, Yang and her colleagues discovered that irisin improves heart contractility by enhancing myocardial calcium levels.⁸

Thus, it seems that we may have finally arrived at the key which unlocks the physiological mechanisms that translate physical exercise into beneficial changes throughout the body. In the words of Li-Jun Yang, Professor of Hematopathology in the University of Florida, College of Medicine, Department of Pathology, Immunology, and Laboratory Medicine and the lead author of the above mentioned study, “instead of waiting for a miracle drug, you can help yourself by changing your lifestyle. Exercise produces more irisin, which has many beneficial effects including fat reduction, stronger bones, and better cardiovascular health.”

But this is just a part of the story. Exercise is claimed to be beneficial not just to promote well-being but to help in sickness as well. Even patients suffering from deadly diseases like cancers can benefit from exercise. Researchers at the University of Copenhagen in Denmark carried out a study on lab mice injected with melanoma cells in an attempt to elucidate the mechanism and published the results in Cell Metabolism in March 2016. Mice were either kept sedentary or allowed to exercise. Exercising mice developed lesser and smaller tumors, had higher epinephrine levels (which was expected since exercise is a stress) and along with that, they also had higher levels of interleukin-6 and natural killer cells with higher penetration of NK cells in the tumours. The researchers concluded that the results “show that voluntary wheel running in mice can reduce the growth of tumors, and

we have identified an exercise-dependent mobilization of natural killer cells as the underlying cause of this protection.”⁹

It seems that we are being given more and more reasons not to be a couch potato and to be out walking if we want to have a healthy life.

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