

The important factor in regulation of metabolic processes is regulatory proteins, which are able to react by feed-back to energetic state of the cell. Big attention is focused on the AMP activated kinase (AMPK) and NAD⁺ activated deacetylase SIRT1. These enzymes interact together and their stimulation increases mitochondrial biogenesis and fatty acid oxidation. Due to this it functions beneficially against the onset of obesity, insulin resistance and ageing. Fasting, exercise and some antidiabetogenic drugs act by these regulators.

n-3 polyunsaturated fatty acids (PUFA) are also known because of their stimulative effects on mitochondrial biogenesis and -oxidation. Previous work of our group have showed that intake of higher dose of n-3 polyunsaturated fatty acids (PUFA) in diet lead to increase in activity of AMPK in white adipose tissue. New results presented in this thesis show that SIRT1 is essential for increase in expression of stimulators of -oxidation (PPAR etc) in response to n-3 PUFA in diet. n-3 PUFA futher improve the metabolic profile synergistically with calorie restriction probably through SIRT1.