

News & Comments

Bear Serum Could Boost our Muscles, According to Scientists

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Cells from human skeletal muscles were cultured with a serum taken from hibernating black bears by [researchers](#) at Hiroshima University and Hokkaido University. Despite being inactive for months at a time, the infusion confirms that unique molecules in their blood prevent them from suffering from muscular atrophy. Humans lose muscle mass after just three weeks of inactivity, contributing to obesity-related diseases.

A balance of mechanisms controls muscle protein synthesis and degradation maintains muscle mass. In human muscle cell cultures, the serum the team extracted from hibernating Japanese black bears significantly stimulated protein synthesis by suppressing the "destruction mechanism" for muscle proteins. Bear serum collected during the summer, when they do not hibernate, did not have this effect.

For five to seven months a year, hibernating bears can remain untouched by food and water. Human muscle mass can be lost after just three weeks of inactivity. Sedentary lifestyles can lead to obesity, diabetes, and even early death as a result. Hibernating bears, however, suffer minimal muscle loss and metabolic dysfunction, and their physical functions remain intact. Skeletal muscle is well known for its 'use it or lose it' principle. However, hibernating animals might be better described under the 'no use but no lose' phenomenon, since there is potential resistance for muscle atrophy during prolonged disuse.

In cultured human skeletal muscle cells, researchers have found that 'some factor' in hibernating bear serum regulates protein metabolism and maintains muscle mass. It has not yet been possible to identify this 'factor'. MuRF1 (muscle RING-finger protein-1) was suppressed, resulting in diminished muscle "destructive mechanisms." According to scientists, bears are able not to use it and not lose it (in terms of muscle mass) because MuRF1 suppresses the shredding of inactive muscles. Researchers are still investigating the hormones and pathways that suppress this protein. It is possible to develop effective rehabilitation strategies for humans and prevent becoming bedridden by identifying this 'factor' in hibernating bear serum and understanding the 'muscles that don't weaken even without use' in hibernating animals, according to the study author

KEYWORDS

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