Avatar armies, assemble!

One of the gold standards in cancer care is the patient-derived xenograft (PDX) mouse. These personalized avatars are used to test how a patient's particular cancer might progress and respond to different therapies. But it takes time to create mice—time patients don't always have.

Alternative animal options are emerging—ones that are cheaper to work with, faster to grow, and offer greater scale than mice: zebrafish and fruit flies. Primary tumor samples can be engrafted into both larval and adult zebrafish, and increasingly complex mutation profiles can be engineered in fish and in flies that mirror the mutations found in particular patients. Our April Technology Feature explores the possibility of new avatar armies for personalized cancer medicine.

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How much exercise is too much?

Practicing regular and moderate exercise is well known to provide a wide range of health benefits: it reduces body weight, boosts the mood, and keeps many diseases away. However, exhaustive exercise can increase in the production of reactive oxygen species, which elevates oxidative damage to lipids, proteins and DNA and induces oxidative stress. A better understanding of the intensity-dependent effects of exercise on the redox status of the body could help maximize the benefits of exercise.

Previous studies in rodents on the effects of exercise on oxidative stress used exercise models such as treadmill running and voluntary wheel. In a new research article, Mousavi and colleagues looked at the effects of forced running wheel exercise (FRW) at different running speeds on several serum biochemical parameters, and oxidative stress biomarkers in skeletal muscle, liver, and serum in the rat. They show that FRW exercise activates an adaptation of the antioxidant system response in skeletal muscle at speeds <16 m/min, whereas it induces oxidative stress at higher speeds in the muscle, liver and serum.

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