

Muscling out the secret



Jogging along the sand dunes may be liberating for the soul but painful for the muscles. It has been long known that muscles are readily damaged when they are used as brakes, such as in downhill walking, where leg muscles are forced to repeatedly contract against the pull of gravity.

This lets calcium ions flood into the muscle cells through minute holes in the surface membrane, triggering widespread damage inside the muscle cells.

Now, researchers at La Trobe have shown that in normal people this turns on an important cellular repair process.

Professor Graham Lamb and Dr Robyn Murphy have discovered that the influx of calcium activates a molecule called calpain-3 which steps into action the day after exercise to repair muscle tissues.

The molecule does such a good job that if the same exercise is repeated a week later it will cause no further discomfort.

The findings of Professor Lamb's team could have major implications for various forms of muscular dystrophy.

Better solar panels

“Examining the optical properties of nano-crystals”

Research that could lead to brighter LCD screens, more efficient solar panels, improved biomedical imaging and high-tech security sensors has won the University of Melbourne's Chancellor's Prize for Excellence in PhD.


Dr Daniel Gomez, who completed his thesis in the School of Chemistry, has shed new light on the properties of semiconductor nano-crystals, particles only a billionth of a metre long.

He is now expanding on his work as a Research Fellow at CSIRO where he is part of a team that is working to develop new sensor applications.

Dr Gomez is working on the “fundamental science” aspect of the project – determining how to incorporate these nano-crystals as highly sensitive components in a variety of sensor devices.

With this sensing technology, it would be possible to detect very small amounts of dry particles – such as biological agents or explosives – in the air or liquid.

They could even result in more sensitive pathology, detecting minute amounts of drugs or hormonal changes in urine tests.

Dr Gomez's PhD at the University of Melbourne examined the optical properties of nano-crystals of cadmium selenide, an element commonly used by the semiconductor industry. 



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