New hope for understanding sudden cardiac arrest

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New biosciences research at the University of Kent could point the way to greater understanding of the heart mutations that cause sudden cardiac arrest.

Hypertrophic cardiomyopathy is a genetic condition that one in 500 people carry and is a leading cause of sudden cardiac arrest in young athletes. The footballer Fabrice Muamba famously collapsed during a match when his heart suddenly stopped. Although he was eventually resuscitated, he is now unable to play football competitively and has a chest implant to restart his heart.

Now a team led by Dr Neil Kad, Lecturer in Molecular Biophysics at the University's School of Biosciences, has managed to identify for the first time at the single molecule level how heart muscle is turned on and off by calcium.

By understanding how the heart is regulated by calcium, the research team has set the ground for greater insight into how the heart is affected when specific components are mutated during disease.

Using this new approach, the researchers were able to identify how the motors (myosins) within muscle talk to each other along the long protein tracks (thin filaments). They found that two motor heads are required to turn on a thin filament segment as regulatory unit. Once activated, this regulatory unit was found to be capable of accommodating 11 further myosin motors.

To date, all treatments for sudden cardiac arrest target the symptoms of this disease. The findings from this study are expected to provide new tools for research into treating the causes of the condition, rather than only the symptoms.

The study will be published in the 23 January issue of the *Journal of Biological Chemistry*.

More information: www.jbc.org/content/early/2014 … 609743.full.pdf+html

Provided by University of Kent