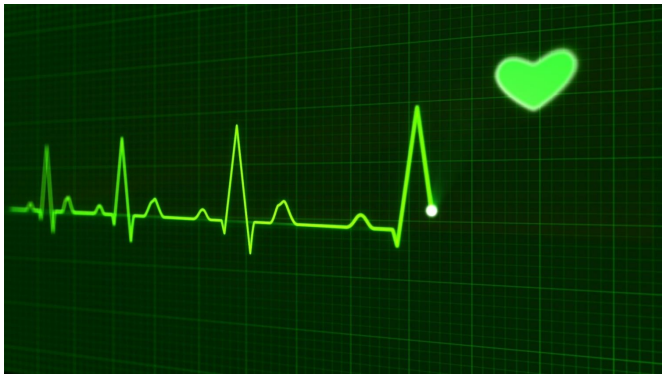
Protein dynamics in the beating heart

18 December 2019, by Leigh MacMillan



Credit: CC0 Public Domain

More information: Adrian G. Cadar et al. Real-time visualization of titin dynamics reveals extensive reversible photobleaching in human induced pluripotent stem cell-derived cardiomyocytes, *American Journal of Physiology-Cell Physiology* (2019). DOI: 10.1152/ajpcell.00107.2019

Provided by Vanderbilt University

The protein titin is a large structural component of the sarcomere—the machinery that mediates contraction of cardiac muscle cells. Despite its importance to the beating heart, little is known about titin turnover.

Adrian Cadar, Ph.D., and colleagues have now used the microscopy technique FRAP (fluorescence recovery after photobleaching) to study titin dynamics in contracting cardiomyocytes.

They used genome editing in human induced pluripotent stem cells (hiPSCs) to introduce a fluorescent tag (mEos3.2) into the titin gene. In cardiomyocytes derived from the hiPSCs, they studied tagged titin dynamics with FRAP. In contrast to expectations, they found that the mEos3.2 tag was not irreversibly photobleached during FRAP, hindering investigation of titin dynamics.

The findings, reported in the *American Journal of Physiology-Cell Physiology*, suggest caution when using FRAP to explore protein dynamics. The authors expect that the hiPSCs expressing fluorescently tagged titin will be useful for preclinical discovery and screening of drugs that affect the contractile properties of the heart.