Periodic Arrangement of Translational Machinery Within Cardiac Muscle fibers

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Recent technological advances have enabled thinning of plunge-frozen samples, thus allowing the visualization of native and unperturbed cellular landscapes. Cryo-focused ion beam (cryo-FIB) milling coupled with cryo-electron tomography (cryo-ET) has consequently been used to elucidate the structure of several cellular protein complexes, including the nanoscale organization of muscle fibers isolated from vertebrate skeletal muscle and within intact neonatal rat cardiomyocytes. These studies have provided tremendous insights into the architecture of sarcomeres and direct visualization of thin filament sliding during muscle contraction. Here, we use such state-of-the-art methodologies to address the translational landscape in primary neonatal rat cardiomyocytes. We observe periodic arrangement of translating ribosomes across different scales.