Heart scanning grant

Myocardiac activity presents in the electrocardiogram as a characteristic peak preceded and followed by waveforms thought to indicate activity in different parts of the heart. The electrocardiogram is typically recorded using a maximum of five (5) leads, in order to capture the electrical activity of the heart from multiple locations.

High density electrocardiogram combined with high temporal resolution MR imaging of the heart has the potential to produce new insights about heart structure/function relationships. In particular, the relationship between components of the electrocardiogram and physical changes in heart structure across the beat cycle.

Trial-by-trial variations in simultaneously recorded high density ECG and rapid MRI of spontaneous heart activity. The advent of wearable technology for constant physiological monitoring in the general populace presents great opportunities to improve health care across the population. However, aberrant ECG activity is often innocuous, and truly pathological activity is often difficult to detect using ECG. An improved understanding of how the ECG relates to underlying heart activity would improve our understanding of how differences in ECG signals across both time and individuals.

Trial-wise coupling of heart structure and electrophysiological parameters. Structure: segment the heart based on correlation intensity and plot as 3d image