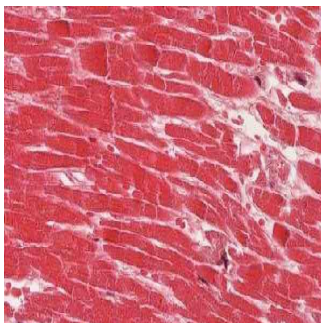


## Heart Muscle Inflammation Peaks Twice after MI



A new study provides evidence challenging the current consensus in cardiology that peak myocardial oedema (heart muscle swelling) only occurs immediately after a myocardial infarction (MI) or heart attack. In the study, researchers discovered a second wave of swelling and inflammation which occurs within a week of a heart attack.

The discovery of this second wave of inflammation could advance the use of cardiac magnetic resonance (CMR) imaging to better assess initial damage caused by a heart attack, according to researchers from the Mount Sinai Heart at Icahn School of Medicine at Mount Sinai (NY, USA) and Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC) in Spain. Also, it may help experts to design targeted therapies that interrupt the two inflammatory reactions to better protect a patient's heart muscle.

"Our study found that the inflammatory reaction of the heart post-heart attack is not stable or homogeneous," said senior study author Borja Ibáñez, MD, PhD, head of the Experimental Cardiology Group at CNIC and clinical cardiologist at the Hospital Clínico San Carlos in Spain. The old belief is that the heart muscle responds in a stable and progressive way to an MI or blockage, with the response pattern starting right after the attack and lasting at least a week.

"In fact, we have identified that a new systematic and consistent two-wave inflammatory reaction occurs causing swelling and thickening of the heart muscle at two different times during a week's time," Dr. Ibáñez noted. The study was presented as a Late-Breaking Clinical Trial at the American Heart Association (AHA) Scientific Sessions 2014 and published simultaneously in the *Journal of the American College of Cardiology*.

In the preclinical study, Dr. Ibáñez et al. performed comprehensive imaging using advanced 3 Tesla CMR technology to study the myocardium's inflammatory process, and later assessed heart muscle tissue samples to assess its overall water content swelling.

In the study, the researchers first categorised the two-phase inflammatory response as an initial massive inflammatory reaction immediately after an MI, accompanied by a significant increase in the myocardial tissue thickness that lasts a week. Subsequent observations, however, determined that a first wave of inflammation subsides a few hours after a heart attack, and then a second, separate wave of inflammation occurs a week later.

"Our study shows the first evidence of the heart's dual inflammatory reaction after a myocardial infarction," said co-author Valentin Fuster, MD, PhD, Director of Mount Sinai Heart at Icahn School of Medicine at Mount Sinai and General Director of CNIC in Spain. "We now know the heart responds to a myocardial infarction in a different way than we once thought with the initial inflammatory reaction followed by a second reactive inflammatory wave. This new data may be truly paradigm-shifting for the future treatment of heart attack patients."

Mount Sinai Heart is ranked 10th nationally for heart services by *U.S. News & World Report*. Its team of award-winning physicians has invigorated the science of cardiovascular medicine, pioneering treatments for arrhythmias, coronary artery disease, heart failure, valvular disease, and vascular disease.

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