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# The Potential Roles of the Transient Receptor Potential Vanilloid 2 in Post Myocardial Infarction Immune Reactions

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**Background:**
New families of channels that may have a role in cardiac calcium homeostasis and/or structural remodeling have recently been described. These are non-selective and non-voltage-gated transient receptor potential (TRP) channels; most of them are permeable for $Ca^{2+}$and gated by diverse stimuli. The TRP channels were shown to be associated with cancer and immune diseases. One of which, TRPV2, has been shown to be expressed in inflammatory cells and in the cardiovascular system including the heart.

**Methods:**
Lewis rats as well as C57Bl/6 mice underwent an acute MI by LAD ligation or chest opening only (sham-operated control). Five days later, total RNA extracted from the ventricles was subjected to Affymerix GC GeneChiparray followed by real time validation analysis. In addition, an IHC staining of theLVsections post-acute MI, using an anti-TRPV2 antibody and a flow cytometry analysis using TRPV2 and CD11b/c antibodies were carried out to characterize the cardiac subpopulations expressing TRPV2.

**Results:**
A clear upregulation of TRPV2 mRNA, but not of any other TRP gene family member, was observed, both in rats and in mice, upon acute MI compared to sham. An IHC stain demonstrated a substantial expression of TRPV2 in infiltrating leukocytes 3 days post infarction. Ten days post infarction the TRPV2 expressing leukocytes were confined to the peri-infarct area only. A flow cytometry analysis suggested that the TRPV2-expressing infiltrating leukocytes are, at least in part, monocytes/ macrophages. These data stand in line with *Caterina, Nat Immunol, 2010*, suggesting that TRPV2 may play a pivotal role in phagocytosis and thus might harbor fundamental importance in innate immunity.

**Conclusion:**
TRPV2 may play an important role in post MI phagocytosis and innate immunity processes. A better characterization of this channel may pave the way for identifying new targets and novel treatment modalities for post MI patients.