# Splicing polymorphism and its function in TRPA1 channel

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The TRPA1 channel is $Ca^{2+}$-permeable non-selective cation channel that shows exquisite sensitivity to reactive oxygen species (ROS). While accumulating evidence has indicated that TRPA1 mediates various physiological functions, such as pain sensing, in mice, the function of TRPA1 is not fully understood in human. Here, we identified and characterized novel splice variants of TRPA1 from human brain cDNA library, one of which excludes the 5′ part of exon 2. Our electrophysiological and intercellular $Ca^{2+}$ measurements revealed that this TRPA1 variant has higher redox sensitivity than intact TRPA1 despite no difference in the sensitivity to the TRPA1 agonist, allyl isothiocyanate. Interestingly, overexpression of the variant increases mitochondrial ROS levels. Altogether, these results suggest that the novel human TRPA1 splice variant exhibits hyper sensitivity to ROS by changing the cellular redox status.