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Phospholipids interact with intracellular region of TRPM4 ion channel

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Transient receptor potential melastatin-4 (TRPM4) is a calcium-activated non-selective ion channel serving as monovalent ion transporter. Receptor plays a plethora of roles in cell sensors systems participates in ongoing processes in neurons, cardiomyocytes, pancreas cells and T-cells. It has been proven link between defects in the TRPM4 receptor and progressive familial heart block type 1B. The regulation of most TRP channels is inter alia mediated by intracellular proteins and other signal molecules. The direct binding of phosphatidyl inositol-4, 5 bisphosphate (PIP2), a minor phospholipid component of cell membranes to TRP channels and its unique role in receptor modulation have been described previously. We have utilized biochemical and molecular modelling methods to study the interactions of the proximal N-terminal region of TRPM4 with PIP2 and its homolog phosphatidyl inositol- 3,4,5trisphosphate (PIP3). Basic amino acid residues R755 and R767 were determined to be involved in the interaction with PIP2 and PIP3. This is a first report dealing with PIP2 and PIP3 binding at the N-terminus of the TRPM4 receptor. It can be assumed that any binding site for PIP2 is always also for PIP3. These findings provide new insight into the ligand binding domains of the TRPM4 channel.

Biography

Kristyna Bousova is a PhD student of Biochemistry and Patobiochemistry at 2nd Faculty of Medicine Charles University in Prague. During her 3 years of studies, she participates on 2 publications focused on interaction of TRP channels with their modulatory molecules. She holds a Master's degree in Biochemistry from Faculty of Science Charles University in Prague.

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