



Novel Modification of Immunomodulatory Protein (*Alexey G. Ryazanov, RWJ 04-41*)
Diagnostic/Therapeutic Target

Background

TRPM7 is a bifunctional molecule consisting of an ion channel fused to a protein alpha-kinase domain and plays an important role in magnesium homeostasis, proliferation and cell death. Although this channel kinase has been characterized using electrophysiological techniques, the function of the kinase domain as well as its endogenous substrates still remains unknown. Research at UMDNJ has revealed that annexin 1, a member of annexin family of Ca²⁺-regulated phospholipids binding proteins, is a substrate for TRPM7 kinase. This protein has been shown to play a role in proliferation, inflammation, apoptosis and cancer.

Description of the Technology

UMDNJ researchers have discovered a novel modification of annexin 1 protein. This protein consists of a Ca²⁺ and membrane-binding core and N-terminal tail preceding the core. The N-terminal region is crucial for its interaction with both intracellular and extracellular targets responsible for regulating proliferation and inflammation. TRPM7 phosphorylates annexin at the conserved Ser5 residue within the N-terminus. Since N-terminus is known to interact with other proteins and membranes, phosphorylation of N-terminus may be pivotal in modulating its function.

Applications

The development of new therapeutics for modulation of inflammation, cancer, heart diseases, arthritis, skin diseases, and anoxic neuronal cell death
As a marker of diagnosis of cancer, heart diseases, arthritis, and skin diseases

Patent Status

United States Patent application filed

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