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Research Project

Regulation of Cell Surface Signaling by Coronin Proteins

Third-party funded project

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Organisation / Research unit

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Department

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Eukaryotic cells need to be able to respond to a plethora of signals received from the environment, both in order to survive as well as to be able to communicate among each other. Our laboratory is investigating the role of members of the coronin protein family in the transfer of extracellular signals to an intracellular response. Coronin proteins are widely conserved among all eukaryotes, and are associated with a wide array of activities. While in the lower eukaryote *Dictyostelium*, coronin has been linked to phagocytosis, cytokinesis and motility, in mammals the seven members of the coronin protein family have been associated with functions as diverse as pathogen survival, lymphocyte homeostasis and tumor progression. However, the precise function as well as the mechanism of action for coronin proteins in higher eukaryotes has remained largely unclear. The best studied mammalian coronin, coronin 1 (also known as P57 or TACO, for Tryptophan Aspartate containing COat protein) was originally identified as a protein that allows the survival of pathogenic mycobacteria within macrophages via regulation of the Ca^{2+} /calcineurin pathway; Subsequent work revealed an essential role for coronin 1 in T cell survival by modulating prosurvival signaling following T cell receptor triggering, suggesting that coronin 1 functions as a regulator of signal transduction, responsible for the survival of peripheral T cells, as well as intracellular survival of *Mycobacterium tuberculosis* in macrophages. In the proposed research, we intend to delineate the role for coronin proteins at the cellular and molecular level in order to unravel the mechanism of coronin-dependent signal transduction. Given the association of aberrant coronin 1 expression with susceptibility to immune-related disorders both in mice and in human, the proposed work may contribute to a better understanding of the role of coronin 1 and possibly other coronin proteins in normal physiology as well as in disease.

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