Apr 8th, 2:35 PM - 3:35 PM

Cross-Talk Between RHO GTPases Regulates Actin Cytoskeleton and Cell Movement

Katherine Lee
Illinois Wesleyan University

HeeDon Chae
Illinois Wesleyan University

Yi Gu
Illinois Wesleyan University

Elizabeth Balser, Faculty Advisor
Illinois Wesleyan University

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CROSS-TALK BETWEEN RHO GTPASES REGULATES ACTIN CYTOSKELETON AND CELL MOVEMENT

Katherine Lee and HeeDon Chae, and Yi Gu and Elizabeth Balser*
Biology Department, Illinois Wesleyan University
Division of Experimental Hematology, Cincinnati Children's Hospital Medical Center

Guanosine triphosphatases (GTPases) are small enzymatic proteins associated with the plasma membrane that are important in cell movement and proliferation. RhoH is a unique GTPase because it is exclusive to hematopoietic stem cells (precursors of all blood cells) and because, unlike many GTPases, it does not cycle between active and inactive states. These two characteristics directed our study of RhoH and its interaction with two additional GTPases, Rac1 & 2. Our studies show that RhoH can block the activity of Rac1 & 2 in regulation of cytoskeleton formation and cell movement, as seen in cell division. We identified specific portions of the RhoH gene sequence responsible for its localization and activity, allowing for mutation studies. RhoH is found in cells that precede blood cells, and it has important implications for bone marrow transplants and gene therapy treatments. Future studies will continue to characterize the actions of RhoH through interactions with additional proteins in the signaling process.