Researchers identify SH2 domains as lipid-binding modules for cell signaling

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Majority of human Src homology 2 domains not only bind to proteins, but also interact with membrane lipids with high affinity and specificity. The SH2 domain-containing proteins play important roles in various physiological processes and are involved in cancer development. This study reveals how lipids control SH2 domain-mediated cellular protein interaction networks and suggests a new strategy for the therapeutic modulation of pY-signaling pathways.

Prof. You-Me Kim and her student Dajung Jung at Pohang University of Science and Technology (POSTECH), in collaboration with Prof. Wonhwa Cho's group at the University of Illinois at Chicago, have identified that the majority of human Src homology 2 (SH2) domains not only bind to proteins, but also interact with membrane lipids with high affinity and specificity. Their research was published in the online edition of *Molecular Cell* on March 24th.

The SH2 domain interacts with proteins and participates in intracellular signaling by binding to phosphortyrosine (pY) residues of partner proteins. Their mode of interaction with other proteins has been well characterized for a long time. Prof. Kim and her team found that the newly identified lipid binding by the SH2 domain is evolutionarily conserved, suggesting that the interaction serves as an important function for controlling intracellular signal transmission.

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study reveals how lipids control SH2 domain-mediated cellular protein interaction networks and suggests a new strategy for the therapeutic modulation of pY-signaling pathways. Specific inhibitors blocking the SH2 domain-lipid interaction can potentially be developed as an anti-cancer drug.

Provided by Pohang University of Science & Technology (POSTECH)