Juvenile Hormone Antagonizes an Effect of PSP1 on Pasmatocyte-spreading Behavior of *Spodoptera exigua*

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In response to nonself, both granulocytes and plasmatocytes of *Spodoptera exigua* exhibited their cell shape change as characteristic spreading behaviors. Granulocytes spreaded uniformly around the cells, whereas plamatocytes spreaded along one axis. Plasmatocytes were separated from total hemocytes by Percoll gradient. Purified plasmatocytes spreaded in response to an insect cytokine, PSP1, identified from *Pseudoplusia includens* in dose- and time-dependent manners. Interestingly, the PSP1 responses of plasmatocytes in *S. exigua* were varied among different ages of fifth instar larvae in a sensitivity order of L5D5 < L5D1 < L5D3. Considering endocrine change in the final instar, juvenile hormone (JH) and ecdysteroid hormones were tested in terms of their modulation of plasmatocyte sensitivity to PSP1. Pyriproxyfen, a JH analog, significantly inhibited plasmatocyte sensitivity to PSP1. JH-I and JH-II were greater in antagonizing PSP1 action than JH-III. Interesting T3 and T4, vertebrate thyroid hormones, mimicked juvenile hormone action. However, 20-hydroxyecdysone stimulated the plasmatocyte sensitivity to PSP1. These results suggest that the developmental change of plasmatocyte sensitivity to PSP1 is due to JH and ecdysteroid titer change in the final instar of *S. exigua.* To analyzethe action of JH on the hemocytes, cell signal inhibitors were used to PSP1 assay. A protein kinase C inhibitor, Calphostin C, significancy inhibited PSP1 action. Also a protein phosphatase inhibitor, Okadaic acid inhibited PSP1 action. These observations suggest that JH, an interrupt cell signal transduction of target phosphorylation.

Key words: PSP1, *Spodoptera exigua*, cytokine, Juvenile hormone, cell signal