

Eicosanoids Mediate Nodulation Responses to Bacterial Infections in Larvae of the Silkmoth, *Bombyx mori*

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Abstract

1) Nodulation is the first, and qualitatively predominant, cellular defense reaction to bacterial infections in insects and other invertebrates; 2) treating silkworms, *Bombyx mori*, with the eicosanoid biosynthesis inhibitor, dexamethasone, strongly reduced nodulation responses to bacterial infections; 3) the influence of dexamethasone was reversed by injecting the eicosanoid-precursor polyunsaturated fatty acid, arachidonic acid (20:4n-6), into dexamethasone-treated, infected larvae; 4) the presence of an eicosanoid biosynthesis system in silkworms was documented. Demonstrated elements include a digestive phospholipase A₂, incorporation of exogenous 20:4n-6 into fat body phospholipids, the presence of 20:4n-6 in cellular phospholipids, a fat body intracellular phospholipase A₂ that can hydrolyze 20:4n-6 from cellular phospholipids, and eicosanoid biosynthetic enzymes; and 5) these findings support the hypothesis that eicosanoids mediate cellular immune responses to bacterial infections in silkworms.

Keywords: Silkmoth; *Bombyx mori*; insect immunity; nodulation; eicosanoids