

# Apoptosis-Inducing Effect of Entomopathogenic Bacteria on the Hemocyte of Silkworm, *Bombyx mori*

**Sunghwan Cho and Yonggyun Kim**

School of Bioresource Sciences, College of Natural Sciences, Andong National University,  
Andong 760-749, Korea

Entomopathogenic bacteria(*Xenorhabdus nematophilus*, *Xenorhabdus* spp., and *Photorhabdus temperata* subsp. *temperata*) are mutual symbionts of the entomopathogenic nematodes including *Steinernema* and *Heterorhabditis*. These bacteria have potent insecticidal pathogenicity caused by hemolymph septicemia. To explain the septicemia, this research set up a hypothesis that the hemolymph septicemia is caused by the programmed cell death (=apoptosis) of the hemocytes induced by the entomopathogenic bacteria. Apoptosis was determined by cell membrane blebbing and DNA laddering. Injection of the bacteria into the hemocoel of the fifth instar larval of *Bombyx mori* led to a septicemia(no viable hemocytes) at 16h after all three bacterial treatments. These cytotoxic activities were due to the apoptotic changes of the hemocytes showing the membrane blebbing and DNA ladder. The apoptosis began at 4h after the bacterial injection and increased with post injection time. Three pathogenic bacteria, however differed in the degree of apoptosis-inducing effect by the effective bacterial dose and time. These results clearly support the hypothesis that hemolymph septicemia caused by the bacteria is due to then apoptosis-inducing effect.