

Indole and 3-Indolylacetonitrile Inhibits Spore Maturation in *Paenibacillus alvei*

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A variety of bacteria produce large quantities of indole, and it has recently begun to be discovered that indole as an intercellular signal controls diverse aspects of bacterial physiology. In this study, we sought a novel role of indole in a Gram-positive bacteria *Bacillus alvei* that can produce extracellular indole at a concentration of up to 300 μM in the stationary phase in LB medium. The addition of exogenous indole markedly inhibits the survival rate of spores in *B. alvei* without affecting cell growth. Additionally, indole derivatives also influence sporulation; for example, a plant auxin, 3-indolylacetonitrile dramatically (2900-fold) decreased the survival rate of *B. alvei* spores. Electron microscopy shows that indole and 3-indolylacetonitrile inhibit the development of spore coats and cortex in *B. alvei*. This work was supported by the Human Resources Development Program of Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant (No. 20104010100580) funded by the Korean Ministry of Knowledge Economy.