

## Phospholipids against American foulbrood and European foulbrood in honeybees

The University presents a new treatment concept against two devastating honeybee larval diseases, i.e., American and European foulbrood (AFB, EFB), based on the natural compound lysophosphatidylcholine (LPC). LPC exhibits strong antibacterial activity against the causative agents of AFB and EFB and LPC supplementation to honeybee larvae was proven to reduce the outbreak of AFB significantly. The utilization of an LPC based therapy contributes to improve environmental sustainability in honeybee health and may offer new business perspectives in veterinary medicine.

### BACKGROUND

AFB as well as EFB are notifiable pests that can cause major harm to the bee-keepers. In the United States antibiotics such as terramycin and tylosin tartrate are prophylactically used to prevent germination of spores and the proliferation of the causative bacterial agents. Since bacteria acquire resistance and antibiotics may be contaminating honey, their usage is not allowed in Europe. Besides, AFB and EFB will occur again after the finishing of the antibiotic treatment. The most common measure against AFB and EFB in Europe is to burn bees and beehives and to establish an exclusion zone. The usage of the naturally occurring LPC offers a significant improvement over the existing solutions. A survey addressing 150 Austrian beekeepers reported that 84% would consider buying such a product to prevent the outbreak of AFB/EFB.

### TECHNOLOGY

The gram-positive bacterium *Paenibacillus larvae* (P.I.) is the causative agent of AFB. Based on the observation that a midgut ingredient from adult honey bees (*Apis mellifera*) shows a strong antibacterial activity against P.I., a bioactivity guided isolation and characterization of the active principle in honey bee midgut was carried out. LPC was identified to be responsible for the antibacterial activity and can be applied to bee colonies either as a feed additive, spray solution or as part of the comb building materials (wax).

### ADVANTAGES

- naturally occurring substance with potentially minimal side effects
- low toxicity to adult bees and larvae
- potential utilization against other pathogens
- not subject to known resistance mechanisms
- potential to substitute the use of antibiotics



Picture: larvae killed by AFB. (U. Riessberger-Gallé)

### KEYWORDS:

FOULBROOD  
AMERICAN FOULBROOD (AFB)  
EUROPEAN FOULBROOD (EFB)  
HONEYBEE DISEASES  
ANIMAL HEALTH

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### COOPERATION OPTIONS:

LICENSE AGREEMENT  
OWNERSHIP AGREEMENT  
CO-OPERATION AGREEMENT

### DEVELOPMENT STATUS:

APPLICATION DEMONSTRATED  
(IN VIVO IN LARVAE & FIELD TRIALS)

### STATUS OF PATENTS:

EP PATENT (2999329) VALIDATED  
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