

2 May 2008

Bees disease – one step closer to finding a cure *Published online in Environmental Microbiology*

Scientists in Germany have discovered a new mechanism of infection for the most fatal bee disease. American Foulbrood (AFB) is the only infectious disease which can kill entire colonies of bees. Every year, this notifiable disease is causing considerable economic loss to beekeepers all over the world. The only control measure is to destroy the infected hive.

The mechanism of infection (pathogenic mechanism) was originally thought to be through the growth of a bacterium called *Paenibacillus larvae* in the organ cavity of honey bee larvae. The accepted view was that the bacteria germinate preferentially at either end of the gut of honey bee larvae then make holes in the gut wall and enter the larval organ cavity, the presumed primary place of bacterial proliferation.

In a recent paper published in *Environmental Microbiology*, Professor Elke Genersch and colleagues in Berlin explain that they have discovered that these bacteria cause infection in a completely different way. They colonize the larval midgut, do most of their multiplying in the mid-gut - living from the food ingested by the larvae - until eventually the honey bee larvae gut contains nothing but these disease-causing (pathogenic) bacteria. It isn't until then that the bacteria 'burst' out of the gut into the organ cavity thereby killing the larvae. These findings are a major breakthrough in honeybee pathology.

"Now that we fully understand the way in which this disease works, we can start to look at ways of preventing the spread of infection" said Professor Genersch.

Honeybees are important pollinators of crops, fruit and wild flowers. Therefore, they are indispensable for a sustainable and profitable agriculture but also for the maintenance of the non-agricultural ecosystem. Honeybees are attacked by numerous pathogens including viruses, bacteria, fungi and parasites. For most, if not all of these diseases, the molecular pathogenesis is poorly understood hampering the development of new ideas about how to prevent and combat honeybee diseases.

Professor Genersch added: *"Molecular understanding of pathogen-host interactions is vital for the development of effective measures against infectious diseases. Therefore, in the long run, our findings will help to save large numbers of bees all over the world."*

Notes to Editors:

1. The article referred to is: Fluorescence *in situ* hybridization (FISH) analysis of the interactions between honeybee larvae and *Paenibacillus larvae*, the causative agent of American foulbrood of honeybees (*Apis mellifera*). Dominique Yue, Marcel Nordhoff, Lothar H. Wieler and Elke Genersch. *Environmental Microbiology*, Online Early, doi:10.1111/j.1462-2920.2008.01579.x. [Read the abstract](#)

2. To request a PDF of the full article, email lucy.mansfield@wiley.com

3. To arrange an interview with the author, please contact Professor Elke Genersch: elke.genersch@rz.hu-berlin.de; Tel:(+49) 3303 293833; Fax:(+49) 3303 293840.

4. *Environmental Microbiology* is published by Wiley-Blackwell with the Society for Applied Microbiology. The journal is devoted to the study of microbial processes in the environment, microbial communities and microbial interactions.

5. About Wiley-Blackwell

Wiley-Blackwell was formed in February 2007 as a result of the merger between Blackwell Publishing Ltd. and John Wiley & Sons, Inc.'s Scientific, Technical, and Medical business. Together, the companies have created a global publishing business with deep strength in every major academic and professional field. Wiley-Blackwell publishes approximately 1,400 scholarly peer-reviewed journals and an extensive collection of books with global appeal. For more information on Wiley-Blackwell, please visit www.blackwellpublishing.com or <http://interscience.wiley.com>

6. About the Society for Applied Microbiology (SfAM)

SfAM is the voice of Applied Microbiology within the UK. We are the oldest UK microbiology society with members worldwide. SfAM works in partnership with sister organisations and microbiological bodies to ensure that microbiology and microbiologists are able to exert influence on policy-makers within the UK, in Europe and world-wide. The quality of the microbiologists of the future depends on the standard of education offered, and the Society plays a leading role in working with many different organisations to educate, inform and support the training of our future microbiologists.