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TEACHING	Microbiology I & II Microbial Technology II Advanced Microbiology (MC)	Microbial Technology I Molecular Biology Biotechnology

## Research

We study microbes to boost their potential contributing to biotechnology.

### 1. Screening of novel biologically active substances from actinomycetes.



Fig. 1 Inhibitory effect of the substances produced by strain No. 3-1 on the  $\alpha$ -amylase activity.



Fig. 2 Promotion of the degradation of filter paper by cellulases.

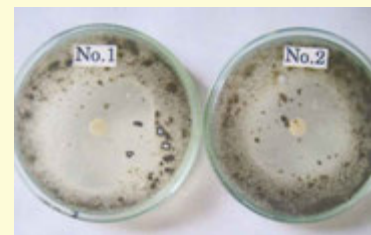


Fig. 3 Inhibition assay of fungal growth shows antifungal agent production by *Streptomyces hetsukaensis*.

### 2. Studies to elucidate the regulation of iron homeostasis by the Hap complex in fungi.

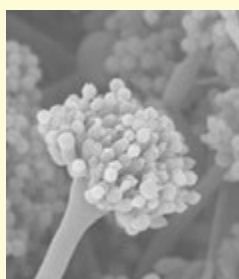


Fig. 4 SEM microscopy of conidia of *Aspergillus nidulans*

### 3. Application of useful genes for biomass utilization.



Fig. 5 Alignment of partial 5'-region sequences among useful genes in fungi.

### 4. Mutualisms between beetles and fungi.

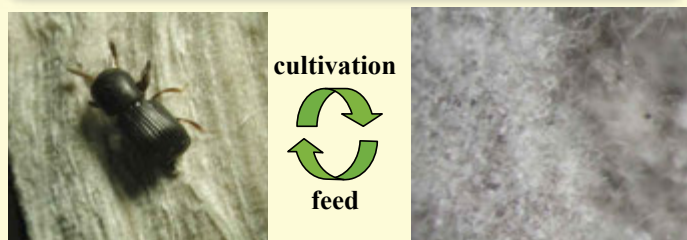


Fig. 6 Ambrosia beetles live in nutritional symbiosis with ambrosia fungi.

#### Recent publications:

- Murakoshi Y. *et al.* (2012) Comparison and characterization of  $\alpha$ -amylase inducers in *Aspergillus nidulans* based on nuclear localization of AmyR. *Appl. Microbiol. Biotechnol.* in press.
- Shimizu M. *et al.* (2010) Mechanism of de novo branched-chain amino acid synthesis as alternative electron sink in hypoxic *Aspergillus nidulans* cells. *Appl. Environ. Microbiol.* 76, 1507-1515.
- Shimizu M. *et al.* (2009) Proteomic analysis of *Aspergillus nidulans* cultured under hypoxic conditions. *Proteomics* 9, 7-19
- Hortschansky P. *et al.* (2007) Interaction of HapX with the CCAAT-binding complex-a novel mechanism of gene regulation by iron. *EMBO J.* 26, 3157-3168.
- Machida M. *et al.* (2005) Genome sequencing and analysis of *Aspergillus oryzae*. *Nature*, 438, 1157-1161.