IN BRIEF

INDUSTRIAL MICROBIOLOGY

De novo biosynthesis of vanillin in fission yeast (*Schizosaccharomyces pombe*) and baker's yeast (*Saccharomyces cerevisiae*)

Hansen, E. H. *et al. Appl. Environ. Microbiol.* 13 Mar 2009 (doi:10.1128/AEM.02681-08)

Most vanillin, the compound in vanilla that gives it its flavour, is produced from petrochemicals or wood pulp lignins. Hansen and colleagues have now produced strains of *Saccharomyces cerevisiae* and *Schizosaccharomyces pombe* that can produce vanillin. They first searched for strains that did not convert vanillin to vanillyl alcohol. They then added genes from the dung mould *Podospora pauciseta*, a bacterium of the *Nocardia* genus, and humans, which allowed the yeast strains to produce vanillin (an additional gene from *Corynebacterium glutamicum* was added to *S. cerevisiae* to activate the *Nocardia* enzyme). At 45–65 mg per litre, vanillin production was at a sufficient level to scale up for large-scale industrial production. These *de novo* pathways for vanillin synthesis in yeast represent the first examples of one-cell microbial generation of these valuable compounds from glucose.

PARASITOLOGY

Influence of ecto-nucleoside triphosphate diphosphohydrolase activity on *Trypanosoma cruzi* infectivity and virulence

Santos, R. F. *et al. PLoS Negl. Trop. Dis.* **3**, e387 (2009)

ATP is an important signalling molecule in the host response to pathogens. Many pathogens, including the eukaryotic parasite *Trypanosoma cruzi*, produce an ecto-nucleoside triphosphate diphosphohydrolase (ecto-NTPDase) that decreases extracellular ATP levels in the human host, thereby decreasing the immune response. Santos and colleagues now show that this enzyme plays an important part in *T. cruzi* infections. Three inhibitors of ecto-NTPDase each decreased *T. cruzi* infectivity. However, recombinant *T. cruzi* NTPDase 1 could be inhibited by only one of the three inhibitors, indicating that *T. cruzi* produces additional ecto-NTPDase enzymes. Ecto-NTPDase could therefore be an important new target for drugs against *T. cruzi*.

BACTERIAL PHYSIOLOGY

RNase E autoregulates its synthesis in *Escherichia coli* by binding directly to a stem-loop in the *rne* 5′ untranslated region

Schuck, A., Diwa, A., Belasco, J. G. *et al. Mol. Microbiol.* 6 Mar 2009 (doi: 10.1111/j.1365-2958.2009.06662.x)

RNase E plays an important part in the breakdown of mRNA and the maturation of tRNA and rRNA in bacteria, as it cuts RNA into single-stranded regions that are AU-rich. Because alterations in the concentration of the enzyme have detrimental effects on the cell, enzyme production is tightly regulated, in part through processing of the RNase E mRNA by RNase E itself. Schuck and colleagues show that the enzyme binds to the conserved hp2 stem loop in RNase E mRNA, yet cleaves that stem loop poorly. The authors speculate that this binding facilitates RNase E cleavage of the mRNA at other sites. Their findings help to clarify the mechanism by which hp2 mediates feedback regulation of RNase E levels.

© 2009 Macmillan Publishers Limited. All rights reserved