

Thermophilic bacterial laccase

A thermophilic laccase has been identified in an extremely thermophilic bacterium when grown in the presence of copper. The protein was purified and the gene was cloned, sequenced, and expressed in *Escherichia coli*. The recombinant enzyme displayed a blue color typical of laccases and copper-dependent oxidase activity on canonical laccase substrates such as guaiacol, 2, 6-dimethoxyphenol, 2, 2'-azino-bis(3-ethylbenzthiazoline-6-sulfonate), and syringaldazine at acidic pH. The enzyme was most notable for its striking thermophilicity; the optimal reaction temperature was $\sim 92^{\circ}\text{C}$ and a half-life of thermal inactivation at 80°C was >14 h, ranking it the most thermophilic laccase reported thus far.

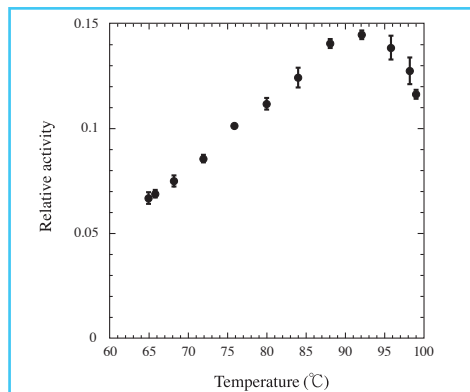


Fig 1: Temperature dependence of activity. The enzyme reacts optimally at $\sim 90^{\circ}\text{C}$.

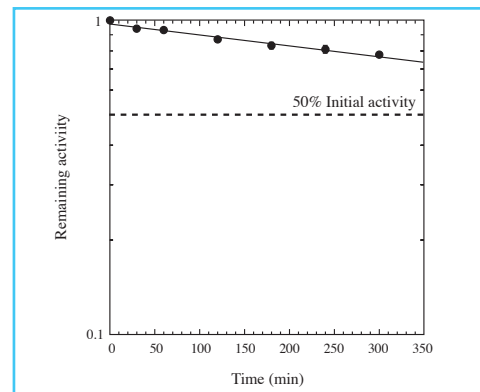


Fig 2: Loss of activity upon incubation at 80°C . Half-life of the enzyme is ~ 14 h.

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Ultra-Slim Network Node Development Aiming to the ubiquitous and the ubiquitous-robot society

The ISI-AIST has previously proposed a concept of "ubiquitous function" to efficiently use every appliance and device distributed in household and office spaces anticipating the materialization ubiquitous robot community in near future. As a part of this technology, efforts have been paid to the development of new communications terminal of higher degree of freedom and I/O features to replace existing information outlets on IC tags.

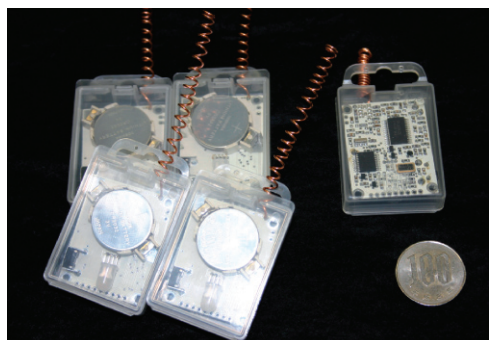


Photo 1: Overview of the developed network node.

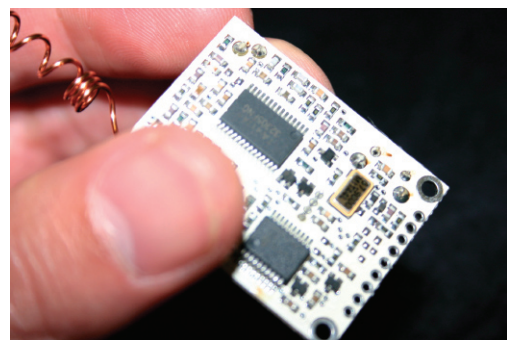


Photo 2: Developed communication terminal.

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