JAPAN ROUNDUP

Researchers in Mikio Yamazaki's group at Chiba University have isolated from *Emericella fungi* a new pharmacological agent that may prove to be an effective anti-depressant—without the unwanted side effects. The compound, norsolorinic acid, inhibits monoamine oxidase (MAO), an abundant brain enzyme that inactivates certain neurotransmitters. In particular, it is able to inhibit type B MAO, an enzyme that plays an important role in MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydro-pyridine)-induced Parkinson's disease.

Norsolorinic acid proved to be as effective in inhibiting MAO in mouse brain and liver tissue as deprenyl and pargyline, two anti-depressants being used in the United States.

Collaborating research scientists at Tokyo University (in Shigeyuki Yokoyama's group) and Yokohama University (in Tatsuo Miyasawa's group)

have converted one type of transfer RNA (tRNA) into another by chemically modifying one of the bases in the anti-codon. This research has been awarded the Japanese Gakushin and Onshi Prizes.

Much of the research was carried out by a graduate student at Tokyo University, Tomoshige Muramatsu. He found that the cytosine residue in the third position of the ile-tRNA isolated from *Escherichia coli* was covalently modified by the attachment of a lysine moiety. This modification causes the anti-codon (UAL) to recognize the AUA codon for isoleucine. Normally, the tRNA (with the anti-codon UAC) would be expected to recognize the codon for methionine (AUG).

Scientists in Shintaro Furusaki's group at Tokyo University have designed a bioreactor for growing immobilized plant cells—in this case, poppy cells that synthesize codeine.

The poppy cells, which are immobilized in a matrix of calcium alginate, convert codeinone to codeine, a compound that is impractical to synthesize *de novo*. The immobilized poppy tissue calli synthesize codeine for five days: subsequent addition of the precursor codeinone resulted in only very low product yields. In contrast, suspension cultures of the same cells maintain their synthetic capability after five days. Furusaki hypothesizes that loss of plant cell function may be caused by the restricted movement of nutrients and waste products in immobilized cultures. In fact, the researchers found that if they decreased the size of the tissue clumps, the cells lived longer and were nearly as efficient in synthesizing codeine as suspension cultures.

Prepared by Hal Plotkin and Ken Coleman, Biotechnology in Japan Newservice, Japan Pacific Associates (Palo Alto, CA).

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