JAPAN ROUNDUP

Scientists at Nippon Shinyaku Co. (Kyoto), a pharmaceutical company in the Mitsubishi group, have discovered that a derivative of pyroglutamic acid (designated LAM) can improve the performance of rats in learning and memory tests after perturbation of brain acetylcholine metabolism. LAM may one day be useful for treating Alzheimer's disease, which is characterized in its early stages by reduced acetylcholine production. LAM is synthesized from D-pyroglutamic acid (2-pyrrolidone-5-carboxylic acid) by an unpublished method. In preliminary experiments, LAM increased memory test scores to 80 percent normal in a group of rats that received scopalamine to disrupt acetylcholine metabolism. LAM is apparently non-toxic: the rats tolerated more than 5 grams per kilogram body weight.

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Scientists at Fuji Latex Co. (Tokyo) and the Industrial Research Council's Institute for Biological Engineering Research have developed a biological method for rapidly degrading rubber latex solid waste. The groups are cooperating to scale up the method for practical use and are working on a similar method for degrading rubber tires. The process uses a special bacterial strain, *Actinomyces nordica*, to degrade solid latex. These bacteria are able to use rubber as their sole carbon source; as they degrade the rubber, the population size increases. In the laboratory, waste latex is stirred in a reaction vessel with the bacteria in water containing small amounts of dissolved nitrate and phosphorous salts. The bacteria soon become attached to the surfaces of the solid latex and gradually work their way to the center. In preliminary experiments using a five-liter reaction vessel, latex surgical gloves were completely dissolved within two weeks.

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Scientists at Tosoh (formerly Toyo Soda; Tokyo), working in collaboration with researchers at Osaka University, have used recombinant DNA techniques to produce high levels of a heat-stable form of thermolysin in *Bacillus subtilis*. Because the protein does not coagulate with others upon heating, it can be purified simply by incubating the bacteria at 80°C and collecting the soluble fraction. The Tosoh and Osaka University researchers isolated the structural genes for two different heat-stable thermolysins from the thermophilic soil bacteria *B. stearothermophilus* MK232 and *B. stearothermophilus* CU21. These bacteria produce thermolysins that are 1.4- and 2-fold, respectively, more active than normal. Although each gene was linked to the same promoter, strains of *B. subtilis* that harbored the MK232 gene produced much higher levels of thermolysin than strains that harbored the CU21 gene.

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