S55-5 Novel L-amino acid ligases catalizing oligopeptide synthesis

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L-Amino acid ligase (Lal, EC 6.3.2.28) is a microbial enzyme catalyzing formation of an alpha-peptide bond from unprotected L-amino acids in an ATP-dependent manner. YwfE protein from *Bacillus subtilis* 168 has been reported as the first Lal, and it synthesizes various dipeptides. Thereafter, several Lals were newly obtained. But these Lals synthesize only dipeptide and no longer peptide. We searched for a novel Lal catalyzing oligopeptide synthesis to extend the variety of peptides synthesized using Lal. We have previously found a new member of Lal RizA from B. subtilis NBRC3134, a microorganism producing peptide-antibiotic rhizocticin.[1)] We newly found that a gene at approximately 9,000 bp upstream of rizA encoded a novel Lal RizB. Recombinant RizB synthesized homo-oligomers of branched-chain amino acids consisting of 2 to 5 amino acids, and also synthesized various heteropeptides. In addition, we searched for new members of oligopeptide synthesizing Lal by in silico analysis using BLAST, which is a set of similarity search programs. Several hypothetical proteins from other microorganisms showed oligopeptide synthesis activity similar to that of RizB.[2)]

1) K.Kino *et al*. *Biosci. Biotechnol. Biochem*., **73**(4), 901-907, (2009).

2) K.Kino *et al*. *Biosci. Biotechnol. Biochem*., in press.