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Bacteriophage M13 Libraries
Displaying Random 22-mer Peptides

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We have characterized a phage library displaying random 22-mer peptides which were produced as N-terminal fusions to the pIII surface protein of M13 filamentous phage. Sixty plaque were picked randomly and without prior selection from the population. The sequences of their peptides were determined. Twenty-five plaques out of sixty ones were library M13 phages and the rest were vectors or wild-type M13 phages. The amino acid sequences of twenty-five phages were randomly distributed except Glycine and Serine.

In order to select some peptides which bind to certain proteins, we have used "panning". By panning the library, we were able to isolate phages that could bind to some of the tested antibodies. The amino acid sequences of the peptides displayed on the selected phages were compared and a putative consensus sequence was found.

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Molecular characterization and Regulation of *cad*BA operon in *Salmonella typhimurium*

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We analysed the sequence of the *cad* operon of *Salmonella typhimurium* encoding lysine decarboxylase, a protein of 714 amino acids and antiporter CadB, of 445 amino acids. The amino acid sequences of lysine decarboxylase has 95.7% homology to that of CadA of *Escherichia coli* and 82.6% to *Hafnia alvei*. Hydrophobicity analysis showed the cellular location of CadA is cytoplasmic domain. Antiporter CadB sequence showed homology to that of CadB of *Escherichia coli*, ArcD of *Pseudomonas aeroginosa*, encoding lysine/cadaverine antiporter and arginine/ornithine antiporter, respectively. Amino acid sequences of CadB of *S. typhimurium* and *Escherichia coli*, and ArcD of *Pseudomonas aeroginosa* showed the alignment of membrane spanning domain.

For the expression of *S. typhimurium cad*BA operon, we present the new regulator *cad*E, not related to *cad*C and *cad*R. CadE acts as a negative regulator for *cad*BA operon expression. It might contribute to the signal transduction of *cad*C-*cad*BA, depending on acidic pH and concentration of lysine. In addition to lysine and pH, *cad* expression was also affected by oxygen level, osmolarity and DNA-binding protein H-NS.