



## Outline of Research

### Backgrounds

- Reduction of environmental load is important issue in chemical industry.
- It is very difficult and high-cost to achieve stereo-specific production by organic synthesis technique.
- Stereo-specific synthesis is one of the strong fields in enzymatic reaction.

### Aim

- To achieve stereo-specific synthesis of optically active useful alcohols or amino acids using enzymes.
- To introduce environmental friendly production methods using biological sciences.

### Results

- I have found novel enzymes useful for production of optically active alcohols or amino acids.
- I have experiences isolating useful microorganisms from environment, such as soil.
- I have been also studying sulfur-containing amino acid metabolism in bifidobacteria.

## Industrial Application

### 【Collaboration with Chemical Industry】

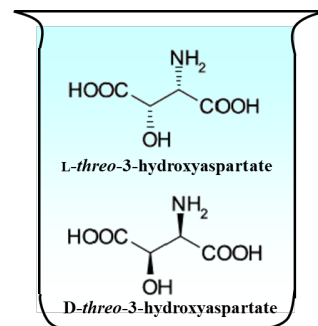
- Efficient production system using enzymes.
- Complex chiral compounds synthesis.
- Reduction of environmental loads.

### 【Collaboration with Food Industry】

- Isolating yeast useful for bread baking or sake brewing.

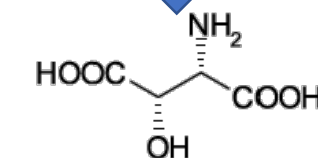
### 【Science Communication】

- Genetically modified microorganisms used in other than "food fields".

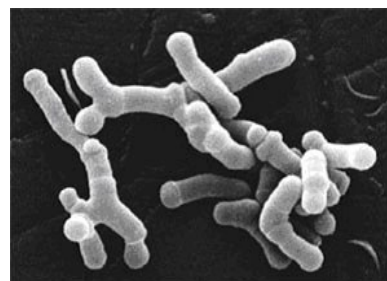


### ACHIRAL MIXTURE

Novel Enzyme Found in Soil Bacterium



Doubly-chiral amino acid synthesis using enzymes.



Bifidobacteria promoting human health



## Research Strengths

Many experiences in collaboration with chemical industry