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## Biochemical characterization of $\beta$ -galactosidases and engineering of their product specificity

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# Propositions

Belonging to the PhD thesis

## Biochemical Characterization of $\beta$ -Galactosidases and Engineering of Their Product Specificity

By Huifang Yin

1. Science is the attempt to understand the mysterious nature and life.
2. Galactose and glucose can be either acceptor substrates or inhibitors of  $\beta$ -galactosidase enzymes, this depends on the enzyme source (Chapter 2).
3. Amino acid residue R484 at the +1 substrate binding subsite of the BgaD-D  $\beta$ -galactosidase is crucial for the enzyme product specificity (Chapter 3).
4. The observation that a single amino acid mutation in an enzyme can cause a very significant change in the product profile (Chapters 3 & 4) is reminiscent of an old Chinese proverb: A minimal deviation may result in wide divergence (差之毫厘，谬以千里).
5. Structure-guided mutagenesis and biochemical characterization is a powerful way to understand enzyme mechanisms (Chapter 4).
6. Bifidobacteria have their own specific preferences for use of and growth on prebiotic compounds, based on size, linkage and monosaccharide composition (Chapter 5).
7. One should be strong both mentally and physically. A strong mind knows where you go, and a strong body brings you there.
8. Always try to stay out of your comfort zone. Little by little, you can go beyond your boundaries.
9. See the world with your eyes, and feel the world with your heart, not from media and others' mouth. You can only have an intact world view and philosophy of life with your own experience.
10. There are two principles to value a person: how one views the world and how many people one inspired.