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Expression and Purification of Human Lysosomal β -galactosidase from *Pichia Pastoris*

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Document Type
Open Access Thesis

Degree Program
Molecular & Cellular Biology

Degree Type
Master of Science (M.S.)

Year Degree Awarded
2014

Month Degree Awarded
September

Keywords
human β -galactosidase, lysosomal storage diseases, *Pichia pastoris*, protein expression, protein purification, biochemistry and molecular biology


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Abstract
Lysosomal storage diseases are genetically inherited diseases caused by the dysfunction of lysosomal enzymes. In a normal cell, lysosomal enzymes cleave specific macromolecules as they are transported to the lysosome. However, in diseased cells, these lysosomal enzymes are either absent or malfunctioning, causing macromolecular substrates to accumulate, becoming toxic to the cell. Over fifty lysosomal storage diseases have been identified, collectively occurring in one out of 7,700 live births. We investigated the lysosomal enzyme β -galactosidase (β -gal). In order to study the biochemistry and enzymology of this protein a robust expression system was needed. The GLB1 gene has been inserted into *Pichia pastoris* creating high protein expressing cell lines. The result of this work will yield a high expression system for β -gal, which can then be subjected to structural and biochemical studies.

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Recommended Citation

Tarullo, Sarah E., "Expression and Purification of Human Lysosomal β -galactosidase from *Pichia Pastoris*" (2014). *Masters Theses May 2014-current*. Paper 118.

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