Digestion and absorption

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This is just an excerpt of a full-length report for this pathway. To access the complete report, please download it at the Reactome Textbook.

18/11/2022
Introduction

Reactome is an open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

Literature references


Reactome database release: 82

This document contains 3 pathways (see Table of Contents)
Fats, carbohydrates, and proteins are broken down to small molecules - fatty acids, cholesterol, and glycerol, monosaccharides, and amino acids - within the lumen of the gastrointestinal tract and absorbed into the body principally through enterocytes in the small intestine. Some of the hydrolases that catalyze these reactions are secreted into the gastrointestinal tract; others are associated with the luminal surfaces of enterocytes. Movement of the final products of digestion out of the intestinal lumen is mediated by arrays of transporters associated with the luminal and basolateral surfaces of enterocytes (Yamada 2015).

**Literature references**


**Editions**

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[https://reactome.org](https://reactome.org)
Dietary carbohydrates, fats, and proteins must be broken down to their constituent monosaccharides, fatty acids and sterols, and amino acids, respectively, before they can be absorbed in the intestine.

Dietary lipids such as long-chain triacylglycerols and cholesterol esters are hydrolyzed in the stomach and small intestine to yield long-chain fatty acids, monoacylglycerols, glycerol and cholesterol through the action of a variety of lipases, and are then absorbed into enterocytes.

Carbohydrates include starch (amylose and amylopectin) and disaccharides such as sucrose, lactose, maltose and, in small amounts, trehalose. The digestion of starch begins with the action of amylase enzymes secreted in the saliva and small intestine, which convert it to maltotriose, maltose, limit dextrins, and some glucose. Digestion of the limit dextrins and disaccharides, both dietary and starch-derived, to monosaccharides - glucose, galactose, and fructose - is accomplished by enzymes located on the luminal surfaces of enterocytes lining the microvilli of the small intestine.

Dietary protein is hydrolyzed to dipeptides and amino acids by the action of pepsin in the stomach and an array of intestinal hydrolases. All of these enzymes are released in inactive (proenzyme) forms and activated by proteolytic cleavage within the gastrointestinal lumen (Van Beers et al. 1995; Yamada 2015).

**Literature references**


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Intestinal absorption

Location: Digestion and absorption

Stable identifier: R-HSA-8963676

Nutrient absorption occurs mostly in the small intestine. Processes annotated here include the uptake of dietary cholesterol and phytosterols, and of monosaccharides. Movement of the final products of digestion out of the intestinal lumen is mediated by arrays of transporters associated with the apical and basolateral surfaces of enterocytes (Yamada 2015).

Literature references


Editions

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