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Gut-related targets

Intestinal Lactase Isomaltase antibodies (Cat # Lact-101AP, P-Lact and PC-Lact)

Alternate nomenclature: Lactase phlorizin hydrolase precursor, Lactase-glycosylceramidase, Lactase-glycosylceramidase, mCG128560

The terminal differentiation of intestinal development occurs during cytodifferentiation and the weaning transition age. Lactase-phlorizin hydrolase (Lact), liver fatty acid binding protein (Fabp1), and sucrase-isomaltase (SI) are well-characterized markers of these transitions. Lact gene expression is spatiotemporally regulated during mammalian gut development. The Zn finger transcription factor family member Gata4 and hepatocyte nuclearfac-1alfa each are indispensable for Lact and Fabp1 expression but both are dispensable for SI gene expression (1). Intestinal and renal epithelial cells are characterized by distinct apical and basolateral membrane domains that are separated by tight junctions and the establishment and maintenance of this polarity depend on specific gene expression and protein targeting to their correct location. One of the protein responsible for correct targeting of proteins is galactic-3, a member of conserved family of lectin proteins. The transport defects in the intestinal brush border Lact in galactin-3 null mutant mice suggest that Lact trafficking involves direct interaction with galactin-3 it transit thru noon-raft-dependent apical transport platform. Deficiency of intestinal lactase, the enzyme required for lactose digestion, can result in symptoms of gastrointestinal malabsorption, or lactose intolerance. Congenital lactase deficiency (CLD) is a cause of disaccharide intolerance and malabsorption characterized by watery diarrhea in infants fed breast milk or lactose-containing formulas. Although the exact cause of CLD is not known, mutations in the coding region of brush border Lact are found to cause CLD in a Finnish study. A mutant Lact (Glycine 1363 was replaced by serine) when expressed in Cos-1 cells resulted in misfolded, enzymatically inactive protein that accumulated in ER. The activity and trafficking is partially restored by expression at permissive temperature (2). Several mutations have been observed in Lactase gene among European populations. A single nucleotide substitution leading to an amino acid change S688 to P in exon 7 and E 1612 to X in exon 12 are found in Italian hypolactasia patients. Five base deletion V565 fsX567 leading to stop codon inexon 6 was found in one and E1612 to X in Exxon 12 was noted in Finnish patents.

In pre weaning rats the intestinal lactase is found in both membrane bound and soluble forms, the distribution and post-translational modifications depend upon hormones, thyroxine and cortisone levels (4). The post natal development of intestine is associated with decrease in particulate Lact activity partly due to proteolysis by luminal proteases, a condition commonly associated with hypolactasia in human (4, 5). Lact is expressed in at least 2 splice forms with apparent MW ranging from 200-240kDa. The Lact has at least 3 “Glycosyl hydrolase family 1” motifs spaced though out the protein. Lact has a single membrane anchor domain near the C-terminal end and has 7 putative asparagines linked glycosylation sites.

The Intestinal lactase-selective antibody was generated against a peptide from the globular domain that is unique to Lactase protein. This epitope is conserved in rat and mouse. The affinity purified mono epitope-specific rabbit polyclonal antibody strongly labels an approximately 200-240kDa intestinal lactase protein in PC-Lact and rat enterocyte cell extracts. The affinity purified anti-Lactase antibody is conjugated to FITC and further purified to remove unconjugated fluorophore and denatured Igs, the FITC conjugated antibody is stabilized for long-term storage. Limited quantities of antigenic blocking peptide for Lact-101AP antibody and western blot positive controls for intestinal lactase in ready-to-use buffer are also available (Please inquire for availability of peptides and western blot positive controls before placing order) . *FabGennix Inc*. will conjugate its antibodies to other fluorophorescent probes and secondary enzymes at nominal charge. *FabGennix Inc.* also provides antibodies against many GPCRs, leptin and other obesity related proteins, for a complete listing, please visit www.FabGennix.com.

Catalog #	Host Species	Nature	Cross reactivity	Quantity	Volume
Lact-101AP	Rabbit	Affinity purified Intestinal Lactase antibody	r, m	100ug	200ul
FITC-Lact	Rabbit	FITC-conjugated Lactase antibody	r, m	100ug	200ul
P-Lact	Rabbit	Antigenic blocking peptide for Lact-101AP	n/a	250ug	200ul
PC-Lact	Rabbit	Western blotting control of Intestinal Lactase	n/a	For 5 appl	inquire

R = rat; M = mouse; H = human; C = chicken; monk = monkey ; * not all variants are labeled equally

Immunogen: Synthetic peptide corresponding amino acids 1081-1095 of rat Lactase protein (aa: IFP PSV QEP GWL PYK). The Lactase peptide is common in both long and short form of Lactase isoforms and is conserved in rat and mouse. The peptide was post-synthetically modified to achieve desired antigenicity before coupling to carrier protein.

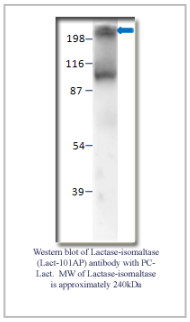
Concentration: Lact-101AP and FITC-Lact antibodies are at IgG concentration 0.65-0.87mg/ml in antibody stabilization buffer.

Applications: Antibody Lact-101AP is ideal for WB, use of this antibody in other applications has not yet worked out. The dilution of Adpn-101AP antibody is for reference only, investigators are expected to determine the optimal conditions for specific assay. WB; 1:500; IMM & i.p pull-down assays:> n.d. Please ask for a complimentary sample of this antibody if you intend to use it in applications not listed here.

Reactivity: This antibody detects a broad diffuse band of 240 kDa in PC-Lact samples. The antibody also reacts to lower MW protein (approximately 95kDa) The identity of this band is not known but may represent a probably a proteolytic fragment of the larger protein.

Protocols: Standard protocol for various applications (WB, IMM and IHC) for this antibody can be obtained by contacting Technical services. All dilutions for this antibody for a specific use is for reference only and investigators may require standardization in the laboratory.

Form/Storage: The antiserum is supplied in antibody stabilization buffer with 0.02% sodium azide. For long-term storage of antibodies, store at -20°C. FabGennix Int. Inc. does not recommend storage of very dilute antibody solutions unless they are prepared in specially formulated multi use antibody dilution buffer (Cat # DilUbuffer). Working solutions of antibodies in DilUbuffer should be filtered through 0.45 filter after every use for long-term storage.



Western blot of Lactase-isomaltase (Lact-101AP) antibody with PC-Lact. MW of Lactase-isomaltase is approximately 240kDa

References:

1. Bosse T, Fialkovich JJ, Piaseckyj CM, Beuling E, Broekman H, Grand RJ, Montgomery RK, Krasinski SD. Gata4 and Hnf1alpha are partially required for the expression of specific intestinal genes during development. 1: Am J Physiol Gastrointest Liver Physiol. 2007 May;292(5):G1302-14.
2. Behrendt M, Keiser M, Hoch M, Naim HY. Impaired trafficking and subcellular localization of a mutant lactase associated with congenital lactase deficiency. Gastroenterology. 2009 Jan 24.
3. Mittal N, Kanwar SS, Sanyal SN. Effect of non-steroidal anti-inflammatory drugs and the pro-carcinogen 1,2 dimethylhydrazine on the rat intestinal membrane structure and function. Nutr Hosp. 2008 Sep-Oct;23(5):439-48.
4. Chaudhry KK, Mahmood S, Mahmood A. Hormone induced changes in lactase glycosylation in developing rat intestine. Mol Cell Biochem. 2008 Nov;318(1-2):183-90.
5. Chaudhry KK, Mahmood S, Mahmood A. Hormone induced expression of brush border lactase in suckling rat intestine. Mol Cell Biochem. 2008 May;312(1-2):11-6.

*For users who may require large amounts of Lact-101AP and FITC-Lact, please enquire about bulk material discounts.

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