

Supplementary Table 1. List of all variables used in the study, categorized by topic: biochemistry, morphometric, inflammation, permeability, enterohormones, Tas2r expression, and metabolomics. The table also includes the type of variable and units, the corresponding tissue, and the comparisons between aging vs. young and GSPE-treated vs. aging groups. Note that inclusion in the table does not imply statistically significant differences between groups.

	Data available in	Variable	Type (Units)	Tissue
Biochemistry	Grau-Bové, Carme et al. Nutrients vol. 12,12 3647. 27 Nov. 2020	Glucose	Metabolite (mM)	Plasma
		Insulin	Metabolite (pM)	Plasma
		Glucagon	Metabolite (pM)	Plasma
		NEFA	Metabolite (mM)	Plasma
	Miguéns-Gómez, Alba et al. International journal of molecular sciences vol. 24,9 7807. 25 Apr. 2023	TAG	Metabolite (mM)	Plasma
		Hydroxybutyrate	Metabolite (mM)	Plasma
		Cholesterol	Metabolite (mM)	Plasma
		Urea	Metabolite (mM)	Plasma
	Sierra-Cruz, Marta et al. Nutrients vol. 13,6 2059. 16 Jun. 2021	Creatinine	Metabolite (μM)	Plasma
		CTXI	Metabolite (ng/mL)	Plasma
		Osteocalcin	Metabolite (ng/mL)	Plasma
		Total SCFA	Metabolite (μM)	Plasma
		HOMA-IR	Ratio	
Morphometric	Miguéns-Gómez, Alba et al. International journal of molecular sciences vol. 24,9 7807. 25 Apr. 2023	Final Body Weight	(g)	-
		Liver	(% of body weight)	-
		Total adiposity	Ratio	-
		Right Kidney	(% of body weight)	-
		Empty Stomach	(% of body weight)	-
		Empty Caecum	(% of body weight)	-
		Caecal Contents	(% of body weight)	-
	Sierra-Cruz, Marta et al. Nutrients vol. 13,6 2059. 16 Jun. 2021	Right Femur	(% of body weight)	-
		Spleen	(% of body weight)	-
		Small Intestine	Length (cm)	-
		Colon	Length (cm)	-
Inflammation	Sierra-Cruz, Marta et al. Molecular nutrition & food research, e70150. 18 Jun. 2025	IL-6	Metabolite (pg/mL)	Plasma
		IFABP	Metabolite (ng/mL)	Plasma
		<i>Mpo</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Nos2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum

Permeability		<i>Il6</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Tnf</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Il1b</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		MPO	Enzymatic Activity (mU/g)	Jejunum
		<i>Mpo</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
		<i>Nos2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
		<i>Il6</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
		<i>Tnf</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
		<i>Il1b</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	Sierra-Cruz, Marta et al. Molecular nutrition & food research, e70150. 18 Jun. 2025	LPS	Metabolite (EU/mL)	Plasma
		TEER	Resistance ($\Omega\cdot\text{cm}^2$)	Duodenum <i>ex vivo</i>
		FITC-Dextran	Marker (μM)	Duodenum <i>ex vivo</i>
		<i>Scarb1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Scarb2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Mylk</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Tjp1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Ocl1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Cldn2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Cldn3</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		<i>Cdkn1a</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
		TEER	Resistance ($\Omega\cdot\text{cm}^2$)	Ileum <i>ex vivo</i>
		FITC-Dextran	Marker (μM)	Ileum <i>ex vivo</i>
		<i>Mylk</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		<i>Tjp1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		<i>Ocl1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		<i>Cldn2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		<i>Cldn3</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		<i>Muc2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Distal Colon
		TEER	Resistance ($\Omega\cdot\text{cm}^2$)	Proximal Colon <i>ex vivo</i>
		FITC-Dextran	Permeability marker (μM)	Proximal Colon <i>ex vivo</i>
		<i>Scarb1</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
		<i>Scarb2</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon

		<i>Mylk</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Tjp1</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Ocel1</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Cldn2</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Cldn3</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Muc2</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
Other	Sierra-Cruz, Marta et al. Molecular nutrition & food research, e70150. 18 Jun. 2025	<i>Cdkn1a</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Cnr1</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Cnr2</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Cdkn1a</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Cnr1</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Cnr2</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
Enterohormone	Grau-Bové, Carme et al. Nutrients vol. 12,12 3647. 27 Nov. 2020	Ghrelin	Metabolite	Plasma
		CCK	Metabolite (pg/mL)	Plasma
		CCK Basal Secretion	Metabolite (ng/mL)	Duodenum <i>ex vivo</i>
		CCK Stimulated Secretion	Metabolite (ng/mL)	Duodenum <i>ex vivo</i>
		GLP-1 Active Basal Secretion	Metabolite (pM)	Ileum <i>ex vivo</i>
		GLP-1 Active Stimulated Secretion	Metabolite (pM)	Ileum <i>ex vivo</i>
	Miguéns-Gómez, Alba et al. International journal of molecular sciences vol. 24,9 7807. 25 Apr. 2023	PYY Secretion	Metabolite (ng/mL)	Ileum <i>ex vivo</i>
		<i>Gcg</i>	mRNA (2 ^{-ΔΔCt})	Ileum
		<i>Glp1r</i>	mRNA (2 ^{-ΔΔCt})	Ileum
		Total GLP-1 Secretion	Metabolite (pM)	Proximal Colon <i>ex vivo</i>
	Miguéns-Gómez, Alba et al. Food & function vol. 13,20 10491-10500. 17 Oct. 2022	<i>Gcg</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Pyy</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Chga</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Gcg</i>	mRNA (2 ^{-ΔΔCt})	Pancreas
Bitter Taste Receptors	Data in present article	<i>Tas2r108</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas2r119</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas2r126</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas2r135</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas2r137</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas2r138</i>	mRNA (2 ^{-ΔΔCt})	Duodenum

	<i>Tas2r139</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
	<i>Tas2r140</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
	<i>Tas2r143</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
	<i>Tas2r144</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Duodenum
	<i>Tas2r108</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r119</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r126</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r135</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r137</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r138</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r139</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r140</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r143</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r144</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Jejunum
	<i>Tas2r108</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r119</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r126</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r135</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r137</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r138</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r139</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r140</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r143</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r144</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Ileum
	<i>Tas2r108</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r119</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r126</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r135</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r137</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r138</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r139</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon
	<i>Tas2r140</i>	mRNA ($2^{-\Delta\Delta Ct}$)	Proximal Colon

Metabolites		<i>Tas2r143</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Tas2r144</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Tas2r108</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r119</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r126</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r135</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r137</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r138</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r139</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r143</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas2r144</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas1r1</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas1r2</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas1r3</i>	mRNA (2 ^{-ΔΔCt})	Duodenum
		<i>Tas1r1</i>	mRNA (2 ^{-ΔΔCt})	Jejunum
		<i>Tas1r3</i>	mRNA (2 ^{-ΔΔCt})	Jejunum
		<i>Tas1r1</i>	mRNA (2 ^{-ΔΔCt})	Ileum
		<i>Tas1r3</i>	mRNA (2 ^{-ΔΔCt})	Ileum
		<i>Tas1r3</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Tas1r1</i>	mRNA (2 ^{-ΔΔCt})	Proximal Colon
		<i>Tas1r1</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
		<i>Tas1r3</i>	mRNA (2 ^{-ΔΔCt})	Distal Colon
Metabolites	Unpublished Data	2-HydroxyButyric acid	Metabolite (μM)	Plasma
		2-Hydroxyisobutyric acid	Metabolite (μM)	Plasma
		2-Hydroxyisovaleric acid	Metabolite (μM)	Plasma
		2-keto-3-methylvaleric acid	Metabolite (μM)	Plasma
		2-ketoisocaproic acid	Metabolite (μM)	Plasma
		3-hydroxybutyric acid / 3-hydroxyisobutyric acid	Metabolite (μM)	Plasma
		3-Hydroxyisovaleric acid	Metabolite (μM)	Plasma
		3-methyl-2-oxobutyric acid / α-ketoisovaleric acid	Metabolite (μM)	Plasma

	3-Phosphoglyceric acid	Metabolite (μM)	Plasma
	4-Hydroxybenzoic acid	Metabolite (μM)	Plasma
	4-hydroxyPhenyllactic acid	Metabolite (μM)	Plasma
	4-Hydroxyproline	Metabolite (μM)	Plasma
	α-Ketoglutaric acid	Metabolite (μM)	Plasma
	α-Tocopherol	Metabolite (μM)	Plasma
	Acètic acid	Metabolite (μM)	Plasma
	Acetyl glycine	Metabolite (μM)	Plasma
	Alanine	Metabolite (μM)	Plasma
	Aspartic	Metabolite (μM)	Plasma
	Benzoic acid	Metabolite (μM)	Plasma
	Butíric acid	Metabolite (μM)	Plasma
	Citric acid	Metabolite (μM)	Plasma
	D-Arabinose	Metabolite (μM)	Plasma
	D-Arabitol	Metabolite (μM)	Plasma
	D-Fructose	Metabolite (μM)	Plasma
	D-Galactitol	Metabolite (μM)	Plasma
	D-Gluconic acid	Metabolite (μM)	Plasma
	D-Mannitol	Metabolite (μM)	Plasma
	D-Mannonic acid	Metabolite (μM)	Plasma
	D-Sorbitol	Metabolite (μM)	Plasma
	D-Sucrose	Metabolite (μM)	Plasma
	D-Threitol	Metabolite (μM)	Plasma
	D-Xylitol	Metabolite (μM)	Plasma
	D-Xylose	Metabolite (μM)	Plasma
	Decanoic acid	Metabolite (μM)	Plasma
	Dodecanoic acid	Metabolite (μM)	Plasma
	Erythronic acid	Metabolite (μM)	Plasma
	Ethanolamine	Metabolite (μM)	Plasma
	Ethylmalonic acid	Metabolite (μM)	Plasma
	Fòrmic acid	Metabolite (μM)	Plasma
	Fumaric acid	Metabolite (μM)	Plasma

		Galactonic acid	Metabolite (μM)	Plasma
		Galacturonic acid	Metabolite (μM)	Plasma
		Glucose-6-phosphate	Metabolite (μM)	Plasma
		Glutamic acid	Metabolite (μM)	Plasma
		Glutamine	Metabolite (μM)	Plasma
		Glyceric acid	Metabolite (μM)	Plasma
		Glycerol	Metabolite (μM)	Plasma
		Glycerol-1-phosphate	Metabolite (μM)	Plasma
		Glycine	Metabolite (μM)	Plasma
		Glycolic acid	Metabolite (μM)	Plasma
		Heptanoic acid	Metabolite (μM)	Plasma
		Hexanoic acid	Metabolite (μM)	Plasma
		Hippuric acid	Metabolite (μM)	Plasma
		Hydrocinnamic acid	Metabolite (μM)	Plasma
		Hypoxanthine	Metabolite (μM)	Plasma
		Iminodiacetic acid	Metabolite (μM)	Plasma
		Indole-3-propanoic acid	Metabolite (μM)	Plasma
		Indolelactic acid	Metabolite (μM)	Plasma
		Isobutíric acid	Metabolite (μM)	Plasma
		Isoleucine	Metabolite (μM)	Plasma
		Isovalèric acid	Metabolite (μM)	Plasma
		L-2-Hydroxyglutaric acid	Metabolite (μM)	Plasma
		Lactic acid	Metabolite (μM)	Plasma
		Leucine	Metabolite (μM)	Plasma
		Linoleic acid	Metabolite (μM)	Plasma
		Malic acid	Metabolite (μM)	Plasma
		Maltoseiso 01	Metabolite (μM)	Plasma
		Maltoseiso 02	Metabolite (μM)	Plasma
		Meso-Erythritol	Metabolite (μM)	Plasma
		Methionine	Metabolite (μM)	Plasma
		Myoinositol	Metabolite (μM)	Plasma
		Nonanoic acid	Metabolite (μM)	Plasma

		Octanoic acid	Metabolite (μM)	Plasma
		Oleic acid	Metabolite (μM)	Plasma
		Ornithine	Metabolite (μM)	Plasma
		Oxoproline	Metabolite (μM)	Plasma
		Phenylalanine	Metabolite (μM)	Plasma
		Phosphoric acid	Metabolite (μM)	Plasma
		Pipecolic acid	Metabolite (μM)	Plasma
		Proline	Metabolite (μM)	Plasma
		Propionic acid	Metabolite (μM)	Plasma
		Pyruvic acid	Metabolite (μM)	Plasma
		Ribonic acid	Metabolite (μM)	Plasma
		Saccharic acid	Metabolite (μM)	Plasma
		Sarcosine	Metabolite (μM)	Plasma
		Sedoheptulose	Metabolite (μM)	Plasma
		Sedoheptulose-2	Metabolite (μM)	Plasma
		Serine	Metabolite (μM)	Plasma
		Stearic acid	Metabolite (μM)	Plasma
		Succinic acid	Metabolite (μM)	Plasma
		Succinic acid	Metabolite (μM)	Plasma
		Taurine	Metabolite (μM)	Plasma
		Tetradecanoic acid	Metabolite (μM)	Plasma
		Threonic acid	Metabolite (μM)	Plasma
		Threonine	Metabolite (μM)	Plasma
		Uracil	Metabolite (μM)	Plasma
		Uric acid	Metabolite (μM)	Plasma
		Valeric acid	Metabolite (μM)	Plasma
		Valine	Metabolite (μM)	Plasma
		Vanillylmandelic acid	Metabolite (μM)	Plasma
		Xylonic acid	Metabolite (μM)	Plasma
		Xylulose	Metabolite (μM)	Plasma

Supplementary Table 2. Spearman correlation analysis between gene expression of Tas2r genes in the duodenum. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Expression Duodenum								
			<i>Tas2r119</i>	<i>Tas2r126</i>	<i>Tas2r135</i>	<i>Tas2r137</i>	<i>Tas2r138</i>	<i>Tas2r139</i>	<i>Tas2r140</i>	<i>Tas2r143</i>	<i>Tas2r144</i>
Expression Duodenum	<i>Tas2r108</i>	Sperman Rho	0.760**	0.559**	0.512**	0.436*	0.644**	0.583**	0.528**	0.603**	0.618**
		p-value	< 0.001	0.002	0.005	0.016	< 0.001	0.001	0.004	0.001	0.001
	<i>Tas2r119</i>	Sperman Rho		0.571**	0.726**	0.555**	0.801**	0.612**	0.584**	0.733**	0.716**
		p-value		0.002	< 0.001	0.002	< 0.001	0.001	0.001	< 0.001	< 0.001
	<i>Tas2r126</i>	Sperman Rho			0.526**	0.379*	0.624**	0.401*	0.458*	0.558**	0.519**
		p-value			0.004	0.039	< 0.001	0.034	0.016	0.002	0.007
	<i>Tas2r135</i>	Sperman Rho				0.619**	0.684**	0.375*	0.528**	0.717**	0.510**
		p-value				< 0.001	< 0.001	0.049	0.004	< 0.001	0.008
	<i>Tas2r137</i>	Sperman Rho					0.775**	0.547**	0.880**	0.802**	0.620**
		p-value					< 0.001	0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r138</i>	Sperman Rho						0.625**	0.753**	0.941**	0.710**
		p-value						< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r139</i>	Sperman Rho							0.563**	0.535**	0.976**
		p-value							0.002	0.003	< 0.001
	<i>Tas2r140</i>	Sperman Rho								0.729**	0.676**
		p-value								< 0.001	< 0.001
<i>Tas2r143</i>	Sperman Rho										0.656**
	p-value										< 0.001

Supplementary Table 2. Spearman correlation analysis between gene expression of Tas2r genes in the jejunum. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Expression Jejunum								
			Tas2r108	Tas2r126	Tas2r135	Tas2r137	Tas2r138	Tas2r139	Tas2r140	Tas2r143	Tas2r144
Expression Jejunum	Tas2r119	Sperman Rho	0.790**	0.890**	0.627**	0.887**	0.760**	0.728**	0.426*	0.723**	0.725**
		p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.017	< 0.001	< 0.001
	Tas2r108	Sperman Rho		0.676**	0.723**	0.698**	0.677**	0.659**	0.529**	0.792**	0.727**
		p-value		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001
	Tas2r126	Sperman Rho		0.620**	0.859**	0.797**	0.783**	0.459*	0.783**	0.765**	
		p-value		< 0.001	< 0.001	< 0.001	< 0.001	0.011	< 0.001	< 0.001	
	Tas2r135	Sperman Rho		0.566**	0.444*	0.465**	0.083	0.535**	0.433*		
		p-value		0.001	0.011	0.007	0.665	0.002	0.017		
	Tas2r137	Sperman Rho		0.817**	0.780**	0.483**	0.736**	0.791**			
		p-value		< 0.001	< 0.001	0.006	< 0.001	< 0.001			
	Tas2r138	Sperman Rho		0.930**	0.568**	0.886**	0.938**				
		p-value		< 0.001	0.001	< 0.001	< 0.001				
	Tas2r139	Sperman Rho		0.648**	0.923**	0.954**					
		p-value		< 0.001	< 0.001	< 0.001					
	Tas2r140	Sperman Rho		0.590**	0.615**						
		p-value		< 0.001	< 0.001						
Tas2r143	Sperman Rho		0.930**								
	p-value		< 0.001								

Supplementary Table 4. Spearman correlation analysis between gene expression of Tas2r genes in the ileum. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Expression Ileum								
			<i>Tas2r119</i>	<i>Tas2r126</i>	<i>Tas2r135</i>	<i>Tas2r137</i>	<i>Tas2r138</i>	<i>Tas2r139</i>	<i>Tas2r140</i>	<i>Tas2r143</i>	<i>Tas2r144</i>
Expression Ileum	<i>Tas2r108</i>	Sperman Rho	0.451*	0.540**	0.585**	0.717**	0.712**	0.303	0.622**	0.513**	0.501**
		p-value	0.021	0.005	0.002	< 0.001	< 0.001	0.110	< 0.001	0.005	0.008
	<i>Tas2r119</i>	Sperman Rho		0.761**	0.679**	0.589**	0.711**	0.536**	0.427*	0.723**	0.392
		p-value		< 0.001	< 0.001	0.001	< 0.001	0.004	0.026	< 0.001	0.058
	<i>Tas2r126</i>	Sperman Rho			0.575**	0.521**	0.773**	0.528**	0.520**	0.838**	0.342
		p-value			0.002	0.004	< 0.001	0.006	0.005	< 0.001	0.094
	<i>Tas2r135</i>	Sperman Rho				0.839**	0.747**	0.513**	0.484*	0.559**	0.454*
		p-value				< 0.001	< 0.001	0.007	0.012	0.002	0.026
	<i>Tas2r137</i>	Sperman Rho					0.777**	0.310	0.611**	0.439*	0.411*
		p-value					< 0.001	0.096	< 0.001	0.013	0.030
	<i>Tas2r138</i>	Sperman Rho						0.567**	0.589**	0.788**	0.545**
		p-value						0.001	0.001	< 0.001	0.004
	<i>Tas2r139</i>	Sperman Rho							0.228	0.572**	0.784**
		p-value							0.244	0.001	< 0.001
	<i>Tas2r140</i>	Sperman Rho								0.424*	0.281
		p-value								0.022	0.164
<i>Tas2r143</i>	Sperman Rho										0.386
	p-value										0.051

Supplementary Table 5. Spearman correlation analysis between gene expression of Tas2r genes in the proximal colon. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Expression Proximal Colon								
			<i>Tas2r119</i>	<i>Tas2r126</i>	<i>Tas2r135</i>	<i>Tas2r137</i>	<i>Tas2r138</i>	<i>Tas2r139</i>	<i>Tas2r140</i>	<i>Tas2r143</i>	<i>Tas2r144</i>
Expression Proximal Colon	<i>Tas2r108</i>	Sperman Rho	0.812**	0.762**	0.831**	0.796**	0.717**	0.804**	0.692**	0.774**	0.755**
		p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r119</i>	Sperman Rho		0.725**	0.913**	0.874**	0.917**	0.952**	0.727**	0.897**	0.883**
		p-value		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r126</i>	Sperman Rho			0.822**	0.636**	0.673**	0.780**	0.511**	0.738**	0.812**
		p-value			< 0.001	< 0.001	< 0.001	< 0.001	0.005	< 0.001	< 0.001
	<i>Tas2r135</i>	Sperman Rho				0.829**	0.890**	0.895**	0.747**	0.893**	0.876**
		p-value				< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r137</i>	Sperman Rho					0.922**	0.862**	0.775**	0.938**	0.838**
		p-value					< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r138</i>	Sperman Rho						0.885**	0.716**	0.926**	0.878**
		p-value						< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r139</i>	Sperman Rho							0.657**	0.886**	0.946**
		p-value							< 0.001	< 0.001	< 0.001
	<i>Tas2r140</i>	Sperman Rho								0.778**	0.600**
		p-value								< 0.001	0.001
	<i>Tas2r143</i>	Sperman Rho									0.832**
		p-value									< 0.001

Supplementary Table 6. Spearman correlation analysis between gene expression of Tas2r genes in the distal colon. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Expression Proximal Colon							
			<i>Tas2r119</i>	<i>Tas2r126</i>	<i>Tas2r135</i>	<i>Tas2r137</i>	<i>Tas2r138</i>	<i>Tas2r139</i>	<i>Tas2r143</i>	<i>Tas2r144</i>
Expression Proximal Colon	<i>Tas2r108</i>	Sperman Rho	0.810**	0.671**	0.400*	0.455*	0.529**	0.652**	0.682**	0.568**
		p-value	< 0.001	< 0.001	0.039	0.010	0.003	< 0.001	< 0.001	0.001
	<i>Tas2r119</i>	Sperman Rho		0.776**	0.633**	0.588**	0.736**	0.746**	0.768**	0.640**
		p-value		< 0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r126</i>	Sperman Rho			0.655**	0.464**	0.678**	0.661**	0.713**	0.612**
		p-value			< 0.001	0.009	< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r135</i>	Sperman Rho				0.225	0.442*	0.502**	0.355	0.511**
		p-value				0.259	0.024	0.008	0.069	0.008
	<i>Tas2r137</i>	Sperman Rho					0.841**	0.804**	0.842**	0.622**
		p-value					< 0.001	< 0.001	< 0.001	< 0.001
	<i>Tas2r138</i>	Sperman Rho						0.855**	0.878**	0.606**
		p-value						< 0.001	< 0.001	0.001
	<i>Tas2r139</i>	Sperman Rho							0.840**	0.835**
		p-value							< 0.001	< 0.001
	<i>Tas2r143</i>	Sperman Rho								0.611**
		p-value								< 0.001

Supplementary Table 7. Spearman correlation analysis between gene expression of Tas2r and inflammatory genes in duodenum. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Duodenum					
			<i>Mpo</i> expression	<i>Nos2</i> expression	<i>Il6</i> expression	<i>Tnf</i> expression	<i>Il1b</i> expression	IL_6
Expression Duodenum	<i>Tas2r108</i>	Sperman Rho	0.328	-0.186	0.564**	0.065	-0.066	-0.109
		p-value	0.089	0.343	0.002	0.746	0.744	0.595
	<i>Tas2r119</i>	Sperman Rho	0.549**	-0.107	0.569**	0.005	-0.260	-0.128
		p-value	0.003	0.596	0.002	0.980	0.199	0.543
	<i>Tas2r126</i>	Sperman Rho	0.350	0.055	0.571**	0.133	0.042	-0.188
		p-value	0.068	0.782	0.001	0.508	0.835	0.359
	<i>Tas2r135</i>	Sperman Rho	0.368*	-0.050	0.532**	-0.090	-0.087	-0.181
		p-value	0.050	0.796	0.003	0.650	0.660	0.367
	<i>Tas2r137</i>	Sperman Rho	0.356*	-0.143	0.460**	-0.015	-0.132	-0.060
		p-value	0.045	0.435	0.008	0.937	0.480	0.752
	<i>Tas2r138</i>	Sperman Rho	0.434*	-0.080	0.671**	0.030	-0.146	-0.200
		p-value	0.015	0.668	< 0.001	0.875	0.441	0.298
	<i>Tas2r139</i>	Sperman Rho	0.443*	-0.271	0.536**	0.093	-0.122	-0.190
		p-value	0.016	0.155	0.003	0.640	0.536	0.332
	<i>Tas2r140</i>	Sperman Rho	0.264	-0.235	0.363	-0.248	-0.242	-0.094
		p-value	0.174	0.228	0.057	0.213	0.224	0.649
	<i>Tas2r143</i>	Sperman Rho	0.488**	-0.129	0.664**	0.072	-0.187	-0.282
		p-value	0.007	0.505	< 0.001	0.717	0.342	0.154
	<i>Tas2r144</i>	Sperman Rho	0.504**	-0.185	0.532**	0.122	-0.182	-0.306
		p-value	0.007	0.356	0.004	0.553	0.373	0.128

Supplementary Table 8. Spearman correlation analysis between gene expression of Tas2r and inflammatory genes in jejunum. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Jejunum				
			<i>Mpo</i> expression	<i>Nos2</i> expression	<i>Il6</i> expression	<i>Tnf</i> expression	<i>Il1b</i> expression
Expression Jejunum	Tas2r108	Sperman Rho	0.193	0.030	0.624**	0.066	0.098
		p-value	0.282	0.872	< 0.001	0.725	0.594
	Tas2r119	Sperman Rho	0.150	-0.141	0.619**	-0.041	0.024
		p-value	0.430	0.474	< 0.001	0.831	0.901
	Tas2r126	Sperman Rho	0.254	0.114	0.508**	0.051	0.009
		p-value	0.169	0.557	0.005	0.794	0.964
	Tas2r135	Sperman Rho	0.196	0.039	0.392*	-0.002	-0.012
		p-value	0.290	0.841	0.036	0.990	0.951
	Tas2r137	Sperman Rho	0.045	-0.027	0.470**	-0.228	-0.007
		p-value	0.805	0.886	0.008	0.217	0.969
	Tas2r138	Sperman Rho	0.142	0.019	0.655**	-0.050	0.037
		p-value	0.437	0.919	< 0.001	0.791	0.843
	Tas2r139	Sperman Rho	0.198	0.023	0.575**	-0.002	0.083
		p-value	0.278	0.904	0.001	0.991	0.655
	Tas2r140	Sperman Rho	0.455*	0.150	0.496**	0.278	0.325
		p-value	0.013	0.456	0.007	0.144	0.092
	Tas2r143	Sperman Rho	0.260	0.044	0.570**	0.039	-0.009
		p-value	0.166	0.823	0.001	0.838	0.964
	Tas2r144	Sperman Rho	0.203	-0.043	0.586**	0.002	-0.004
		p-value	0.283	0.829	0.001	0.993	0.982

Supplementary Table 9. Spearman correlation analysis between gene expression of Tas2r and enterohormone-related genes and hormone secretion in the proximal colon. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations ($p < 0.05$) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Proximal Colon				
			Ghrelin secretion	<i>Gcg</i> expression	<i>Pyy</i> expression	<i>Chga</i> expression	GLP1 secretion
Expression Proximal Colon	Tas2r108	Sperman Rho	-0.120	0.287	0.382	0.140	-0.042
		p-value	0.543	0.139	0.247	0.664	0.874
	Tas2r119	Sperman Rho	-0.022	0.224	0.400	0.175	-0.098
		p-value	0.912	0.251	0.223	0.586	0.708
	Tas2r126	Sperman Rho	-0.240	0.196	0.618*	0.543	0.037
		p-value	0.219	0.317	0.043	0.068	0.889
	Tas2r135	Sperman Rho	-0.045	0.373	0.445	0.252	0.088
		p-value	0.823	0.055	0.170	0.429	0.736
	Tas2r137	Sperman Rho	-0.188	0.208	0.329	0.239	0.059
		p-value	0.339	0.288	0.297	0.431	0.817
	Tas2r138	Sperman Rho	-0.130	0.520**	0.436	0.448	0.091
		p-value	0.526	0.006	0.180	0.144	0.737
	Tas2r139	Sperman Rho	-0.125	0.191	0.318	0.147	-0.132
		p-value	0.544	0.349	0.340	0.648	0.625
	Tas2r140	Sperman Rho	0.077	0.226	0.664*	0.281	0.133
		p-value	0.692	0.238	0.018	0.353	0.598
	Tas2r143	Sperman Rho	-0.104	0.406*	0.636*	0.448	-0.020
		p-value	0.604	0.036	0.035	0.144	0.940
	Tas2r144	Sperman Rho	-0.169	0.271	0.176	0.287	-0.083
		p-value	0.399	0.171	0.627	0.392	0.751

Supplementary Table 10. Spearman correlation analysis between gene expression of Tas2r and permeability-related genes in the proximal colon. Positive Spearman Rho values indicate direct relationships. The corresponding p-values indicate the statistical significance of each correlation. Significant correlations (p < 0.05) are highlighted. All analyses were conducted using nonparametric Spearman correlation. Sample sizes (n) are consistent across comparisons.

			Proximal Colon Permeability								
			TEER	FITC	<i>Mylk</i> expression	<i>Tjp</i> expression	<i>Ocl1</i> expression	<i>Cldn2</i> expression	<i>Cldn3</i> expression	<i>Muc2</i> expression	p21 expression
Expression Proximal Colon	<i>Tas2r108</i>	Sperman Rho	0.496	-0.332	0.168	0.209	0.184	-0.112	-0.049	-0.269	0.253
		p-value	0.060	0.208	0.403	0.296	0.369	0.587	0.809	0.175	0.212
	<i>Tas2r119</i>	Sperman Rho	0.579*	-0.500*	0.168	0.270	0.181	-0.135	-0.029	-0.308	0.420*
		p-value	0.024	0.049	0.403	0.172	0.377	0.511	0.885	0.118	0.033
	<i>Tas2r126</i>	Sperman Rho	0.332	-0.118	0.096	0.109	-0.037	0.093	-0.140	-0.084	-0.056
		p-value	0.226	0.664	0.632	0.587	0.859	0.653	0.485	0.676	0.784
	<i>Tas2r135</i>	Sperman Rho	0.534*	-0.364	0.181	0.205	0.171	-0.009	-0.058	-0.137	0.223
		p-value	0.049	0.182	0.365	0.314	0.414	0.965	0.779	0.504	0.284
	<i>Tas2r137</i>	Sperman Rho	0.468	-0.250	0.175	0.125	0.099	-0.112	-0.063	-0.159	0.304
		p-value	0.079	0.350	0.382	0.536	0.629	0.587	0.753	0.429	0.131
	<i>Tas2r138</i>	Sperman Rho	0.588*	-0.464	0.219	0.248	0.125	-0.094	0.008	-0.159	0.317
		p-value	0.035	0.095	0.282	0.231	0.560	0.662	0.968	0.447	0.131
	<i>Tas2r139</i>	Sperman Rho	0.543*	-0.418	0.135	0.266	0.166	0.026	-0.153	-0.239	0.370
		p-value	0.037	0.107	0.521	0.198	0.438	0.904	0.465	0.249	0.075
	<i>Tas2r140</i>	Sperman Rho	0.357	-0.368	-0.053	-0.101	0.080	-0.261	-0.148	-0.167	0.253
		p-value	0.191	0.161	0.788	0.608	0.692	0.189	0.451	0.396	0.202
	<i>Tas2r143</i>	Sperman Rho	0.591*	-0.454	0.174	0.158	0.067	-0.144	-0.078	-0.159	0.332
		p-value	0.026	0.089	0.385	0.442	0.751	0.493	0.706	0.438	0.105
	<i>Tas2r144</i>	Sperman Rho	0.557*	-0.336	0.130	0.246	0.122	0.018	-0.158	-0.198	0.211
		p-value	0.031	0.221	0.528	0.225	0.563	0.933	0.440	0.332	0.312