

# Tryptophan in stool



## IDK® Tryptophan ELISA

Competitive ELISA for the quantitative determination of L-tryptophan in stool

- ▶ Tryptophan deficiency begins in the gut
- ▶ The healthy microbiome regulates the intestinal tryptophan metabolism
- ▶ In IBD, tryptophan levels are found to be low

Also available:  
Tryptophan ELISA for the  
determination in serum,  
plasma and dried blood  
samples (K7730)

# Low levels of tryptophan in inflammatory bowel diseases (IBD)

The essential amino acid L-tryptophan stems mainly from the diet and is resorbed in the small and large intestines via amino acid transporters. Tryptophan is then degraded by different enzymes to several important metabolites, mainly kynurenine, kynurenic acid, quinolinic acid, NAD (nicotinamide adenine dinucleotide) and small amounts of serotonin (Fig. 1).

Degradation of tryptophan mainly occurs along the kynurenine pathway and comprises at least 90% of tryptophan catabolism. The metabolisation of tryptophan to kynurenine by the enzyme indoleamine 2,3-dioxygenase 1 (IDO1) is the initial and rate-limiting step. Modulation of IDO1 regulates systemic and local immune responses.

Gut bacteria like lactobacilli can also metabolise tryptophan, resulting in bioactive indole derivatives which stimulate locally the production of IL22 via the aryl hydrocarbon receptor (AhR). The cytokine IL22, which is produced by different immune cells, promotes the microbial symbiosis excluding yeasts, and protects the gut mucosa from inflammation<sup>1</sup>.

Only 1% of tryptophan is being metabolised into serotonin via a separate metabolic pathway. This serotonin pathway takes place mainly in the gut and promotes peristaltic movement and secretory functions of the intestine<sup>2</sup>.

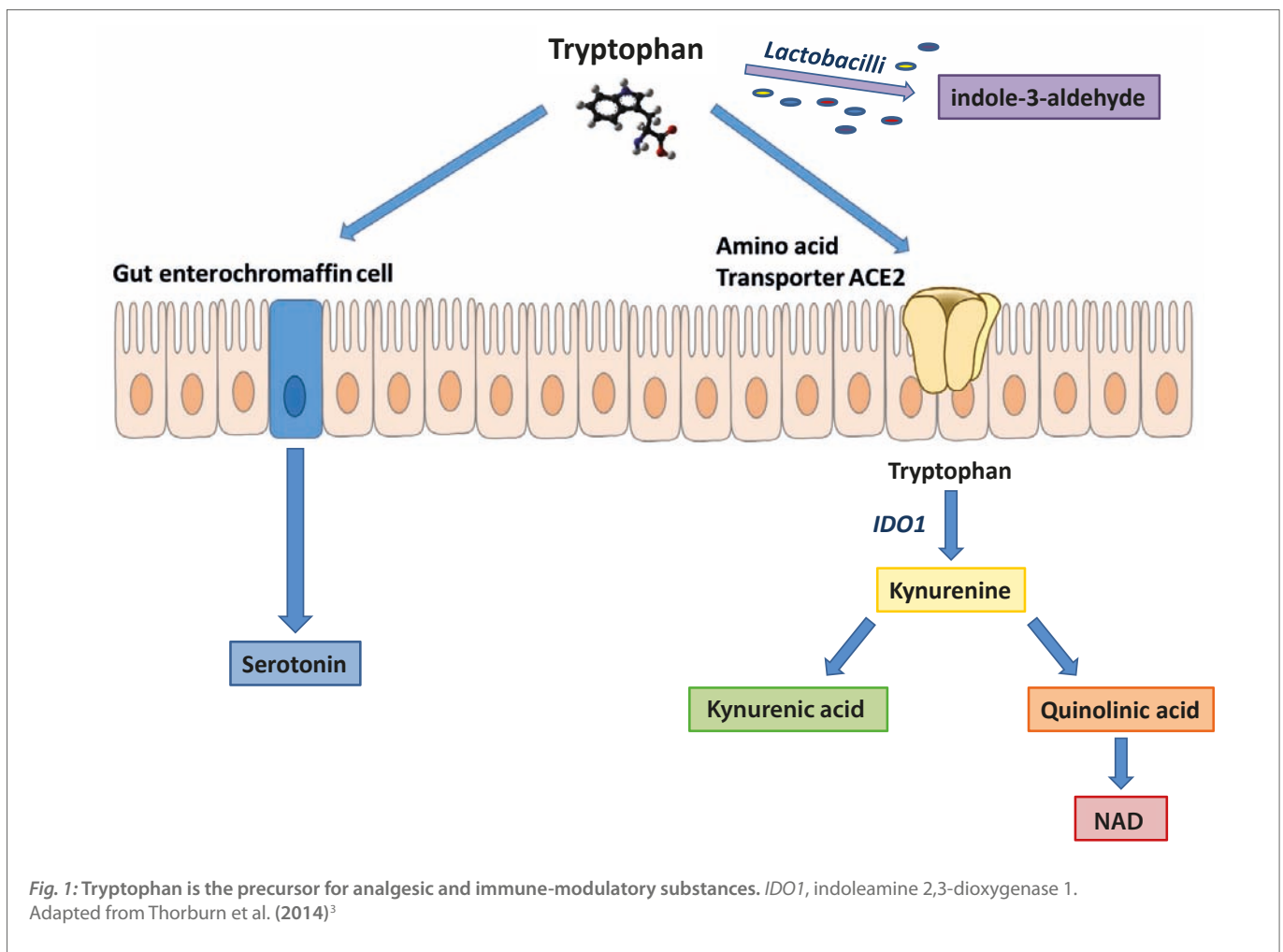
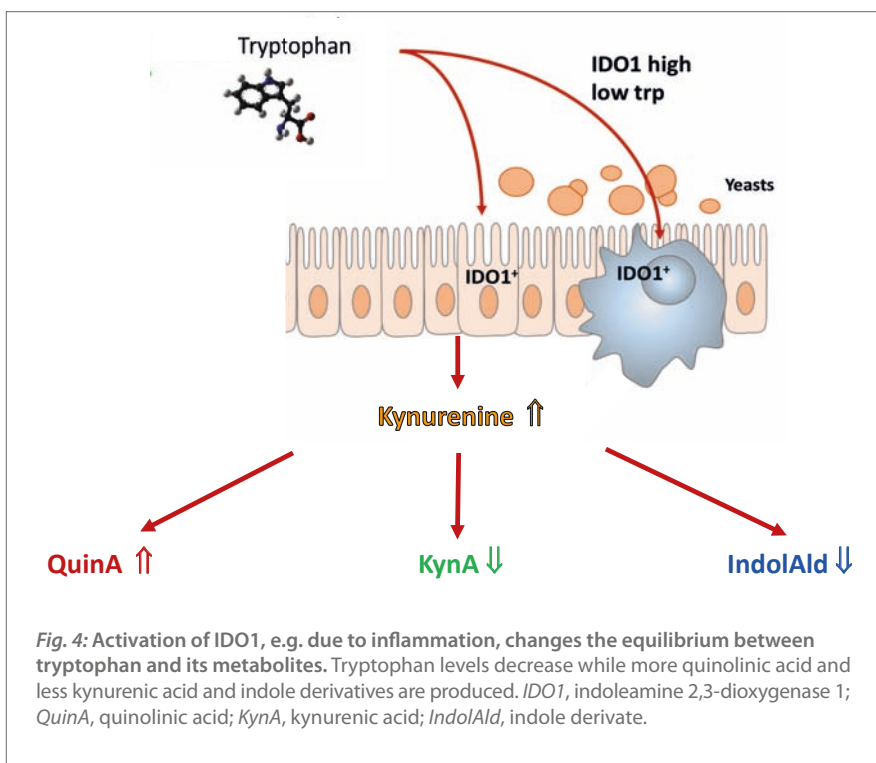


Fig. 1: Tryptophan is the precursor for analgesic and immune-modulatory substances. IDO1, indoleamine 2,3-dioxygenase 1. Adapted from Thorburn et al. (2014)<sup>3</sup>



With normal IDO1 activity, the tryptophan metabolites have a protective function against inflammation and stabilise the intestinal immune system in mice, while high IDO1 activity due to inflammation reduces the benefits of these metabolites<sup>1</sup>.



IDK® Tryptophan	
Matrix	Stool
Sample volume	15 mg
Test principle	ELISA
Cat. No.	K 7729

Also available:

IDK® Tryptophan ELISA (serum, plasma, urine, dried blood samples) (K 7730)

IDK® Tryptophan high sensitive ELISA (KR3730) (for research use only)

IDK® Serotonin ELISA (serum, dried blood samples) (K 6880)

IDK® Kynurenic acid (KynA) (K 7735)



US: all products: Research Use Only. Not for use in diagnostic procedures.

#### Literature:

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➔ Immundiagnostik also offers further PCR diagnostic for microbiome and colon (FOMB 7)



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