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**Manuscript Type:** ORIGINAL ARTICLE

#### *Case Control Study*

**Alteration of fecal tryptophan metabolism correlates with shifted microbiota and may be involved in the pathogenesis of colorectal cancer**

Xi-Zhen Sun, Dong-Yan Zhao, Yuan-Chen Zhou, Qian-Qian Wang, Geng Qin, Shu-Kun Yao

#### **Abstract**

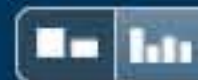
##### BACKGROUND

Gut tryptophan (Trp) metabolites are produced by microbiota and/or host metabolism. Some of them have been proven to promote or inhibit colorectal cancer (CRC) *in vitro* and animal models. We hypothesized that there was an alteration of gut Trp metabolism mediated by microbiota and that it might be involved in the pathogenesis of cancer in patients with CRC.

##### AIM

To investigate the features of Trp metabolism in CRC and the correlation between fecal Trp metabolites and gut microbiota.

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**Tryptophan Metabolism** in Autoimmunity Host and Microbial **Tryptophan Metabolism** Pathways. The essential amino acid Trp is a precursor for the endogenous synthesis of Kyn and serotonin by the host enzymes . Indoleamine-2,3-dioxygenases (IDO1, IDO2), and **tryptophan-2,3-dioxygenase (TDO)** are the mammalian enzymes responsible for catalyzing the ...

Author: Josephine Brown, Brian Robusto, Laur... Publish Year: 2020

### [Frontiers | Tryptophan Metabolism by Gut Microbiome and ...](#)

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Dec 18, 2019 · On the other hand, disruption in the composition of gut microbiota has been found to be associated with the pathophysiology of several **diseases and disorders like inflammatory bowel disease (IBD), colorectal cancer (CRC), diabetes, obesity, etc.** (Becker et al., 2015; Baothman et al. 2016; Kaur et al., 2017; Dahmus et al., 2018).

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Moreover, there were substantial associations of perturbed gut microbiota genera with the altered fecal metabolites, especially compounds involved in the **metabolism of tryptophan** and bile acids.

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Sep 23, 2019 · 2 The Role of Microbiome in Prion and Alzheimer's Disease. The gut microbiota has





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Dec 11, 2019 · Interestingly, a previous study found that formula milk-induced **alterations** in gut **microbiota** shift the **tryptophan metabolism** from serotonin to tryptamine in the neonatal porcine colon . Furthermore, the rate of the microbial **tryptophan metabolism** can be affected by changes in the luminal availability of nutrients, such as carbohydrates.

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**Colorectal cancer** (CRC) is one of the most malignant cancers resulting from abnormal **metabolism alterations**. As one of the essential amino acids, **tryptophan** has a variety of physiological ...

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Jan 01, 2016 · Introduction. Inflammation is a common feature of **colorectal cancer** (CRC). 1 Despite immune cell infiltration, CRCs evade immune surveillance and resist immune-mediated destruction. **Metabolism** of the essential amino acid **tryptophan** along the kynurenine pathway (KP) is one potential explanation for this phenomenon and is recognized as an important link between inflammation and ...

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Publish Year: 2016

## [Frontiers | Fecal Metabolomics and Potential Biomarkers ...](#)

<https://www.frontiersin.org/articles/10.3389/fimmu.2019.00976> ▾

The role of metabolomics in autoimmune diseases has been a rapidly expanding area in researches over the last decade, while its pathophysiologic impact on systemic lupus erythematosus (SLE) remains poorly elucidated. In this study, we analyzed the metabolic profiling of **fecal** samples from SLE patients and healthy controls based on ultra-high-performance liquid chromatography equipped with mass ...

Cited by: 11

Author: Qiong Zhang, Xiaofeng Yin, Haifang Wang, ...

Publish Year: 2019

## [Nutritional Therapy to Modulate Tryptophan Metabolism and ...](#)

<https://www.mdpi.com/2072-6643/12/9/2846/htm> ▾

The aryl hydrocarbon receptor (AhR) is a nuclear protein which, upon association with certain endogenous and exogenous ligands, translocates into the nucleus, binds DNA and regulates gene expression. **Tryptophan** (Tro) metabolites are one of the most important endogenous AhR ligands. The



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Dec 11, 2019 · These **alterations** in the **tryptophan metabolism** may be driven by the gut **microbiota**, as evidenced by a previous study revealing that the colonization of GF rats with gut **microbiota** from depressive patients also induces neurobehavioral changes, with an increased kynurenine to **tryptophan** ratio in blood circulation .

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### [Berberine regulates fecal metabolites to ameliorate 5 ...](#)

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Apr 01, 2020 · 1. Introduction. 5-Fu is one of the most widely used chemotherapy drugs. Studies have shown that 5-Fu improved the overall survival and progression-free survival in **cancer** patients [], but about 50–80% of patients with 5-Fu treatment showed intestinal mucosal damage, with the symptoms like severe diarrhea, nausea, vomiting and anorexia []. This diminished its therapeutic efficacy and affected ...

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Author: Haitao Chen, Fan Zhang, Rongrong Li, Y...

Publish Year: 2020