# Article information:

SARS-CoV-2 induced intestinal responses with a biomimetic human gut-on-chip - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S2095927320307210>

# Article summary:

1. COVID-19 can cause gastrointestinal symptoms in addition to respiratory symptoms, and the intestine is another high-risk organ for SARS-CoV-2 infection.

2. A biomimetic human gut-on-chip model has been created that allows the recapitulation of human relevant intestinal pathophysiology induced by SARS-CoV-2 at an organ level.

3. The gut-on-chip model showed permissiveness for viral infection and obvious morphological changes with injury of intestinal villi, dispersed distribution of mucus-secreting cells, and reduced expression of tight junction (E-cadherin), indicating the destruction of the intestinal barrier integrity caused by virus. Moreover, transcriptional analysis revealed abnormal RNA and protein metabolism, as well as activated immune responses in both epithelial and endothelial cells after viral infection, which may contribute to the injury of the intestinal barrier associated with gastrointestinal symptoms.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

该文章是一篇关于使用人体肠道芯片模拟SARS-CoV-2感染的研究。文章提到了COVID-19对肺部和肠道的影响，并介绍了作者们开发的肠道芯片模型，该模型可以在器官水平上重现SARS-CoV-2感染引起的人类相关肠道病理生理学反应。作者通过三维共培养人类肠上皮、分泌黏液和血管内皮细胞来重建肠上皮-血管内皮屏障的关键特征。该芯片模型显示出对病毒感染的容许性，并表现出明显的形态学变化，包括肠绒毛损伤、分散分布的黏液分泌细胞和紧密连接（E-cadherin）表达降低，这些都表明病毒导致了肠道屏障完整性的破坏。此外，血管内皮也表现出异常的细胞形态学和粘附连接紊乱。转录组分析揭示了RNA和蛋白质代谢异常以及上调细胞因子基因等异常免疫反应，这些可能有助于与胃肠道症状相关的肠道屏障损伤。该芯片模型提供了一个独特而快速的平台，可以加速COVID-19研究并开发新的治疗方法。

从文章内容来看，作者们使用了一种先进的技术来模拟SARS-CoV-2感染引起的人类肠道反应，并对其进行了详细描述。然而，文章存在一些潜在偏见和不足之处。首先，文章没有探讨可能存在的风险和限制，例如该芯片模型是否能够完全重现真实情况、是否存在其他未知因素等。其次，文章没有提供足够的证据来支持其主张，例如如何证明这个芯片模型可以加速COVID-19研究并开发新的治疗方法。此外，文章也没有探讨其他可能影响肠道反应的因素，例如患者年龄、性别、基础健康状况等。

总之，虽然该文章介绍了一种有前途的技术来模拟SARS-CoV-2感染引起的人类肠道反应，并提供了一些有用信息，但它也存在一些不足之处。未来需要更多深入和全面地研究来验证这种技术在临床应用中的可行性和有效性。

# Topics for further research:

* Potential risks and limitations of the chip model
* Lack of evidence to support the claims made in the article
* Other factors that may affect intestinal response to COVID-19
* Need for further research to validate the technology's clinical feasibility and effectiveness
* Advantages and disadvantages of the chip model compared to other methods
* Ethical considerations surrounding the use of human tissue in research.

# Report location:

<https://www.fullpicture.app/item/3186320f7a277b4112c73b99c85c56cd>