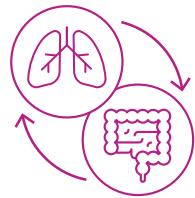


GUT-LUNG AXIS: HOW DOES GUT MICROBIOTA PROTECT AGAINST RESPIRATORY INFECTIONS?



DEFINITION

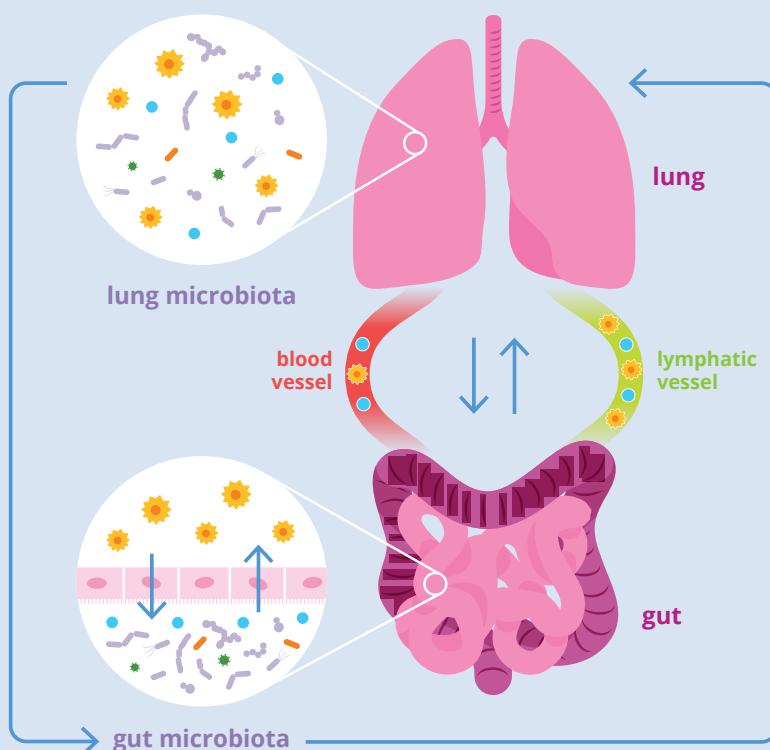
The **gut-lung axis** is a bidirectional communication between the gut and the lungs, in which **gut microbiota** plays a key role.

DID YOU KNOW?

80% of immune cells are present in the gut.

HOW DOES THE GUT-LUNG AXIS WORK?

lung-gut communication
bacteria and microbial metabolites from the lungs can spread to the gut and influence its functioning.



gut-lung communication
gut immune cells and microbial metabolites enter bloodstream, activating the immune system and protecting lungs from viral infections.



immune cells



microbial metabolites



virus



pathogens bacteria



PRESERVING A HEALTHY GUT MICROBIOTA COULD...



boost gut immunity



help to maintain lungs health

and help to prevent...
viral respiratory infections
influenza, Covid-19...

HOW TO MAINTAIN A HEALTHY MICROBIOTA?



probiotics



prebiotics



rich fiber diet



Infography, sources

Gut-lung axis: how does gut microbiota protect against respiratory infections?

[Al-Qadami GH, Secombe KR, Subramaniam CB et al. Gut Microbiota-Derived Short-Chain Fatty Acids: Impact on Cancer Treatment Response and Toxicities. *Microorganisms*. 2022;10\(10\):2048.](#)

[Antunes KH, Fachi JL, de Paula R et al. Microbiota-derived acetate protects against respiratory syncytial virus infection through a GPR43-type 1 interferon response. *Nat Commun*. 2019;10\(1\):3273.](#)

[Budden KF, Gellatly SL, Wood DL et al. Emerging pathogenic links between microbiota and the gut-lung axis. *Nat Rev Microbiol*. 2017;15\(1\):55-63.](#)

[Dang AT & Marsland BJ. Microbes, metabolites, and the gut-lung axis. *Mucosal Immunol*. 2019;12\(4\):843-850.](#)

[Enaud R, Prevel R, Ciarlo E et al. The Gut-Lung Axis in Health and Respiratory Diseases: A Place for Inter-Organ and Inter-Kingdom Crosstalks. *Front Cell Infect Microbiol*. 2020;19:10:9.](#)

[Harper A, Vijayakumar V, Ouwehand AC et al. Viral Infections, the Microbiome, and Probiotics. *Front Cell Infect Microbiol*. 2021;10:596166.](#)

[Ichinohe T, Pang IK, Kumamoto Y et al. Microbiota regulates immune defense against respiratory tract influenza A virus infection. *Proc Natl Acad Sci U S A*. 2011;108\(13\):5354-9.](#)

[Moroishi Y, Gui J, Hoen AG et al. The relationship between the gut microbiome and the risk of respiratory infections among newborns. *Commun Med \(Lond\)*. 2022;2:87.](#)

[Samuelson DR, Welsh DA, Shellito JE. Regulation of lung immunity and host defense by the intestinal microbiota. *Front Microbiol*. 2015;6:1085.](#)

[Sencio V, Machado MG, Trottein F. The lung-gut axis during viral respiratory infections: the impact of gut dysbiosis on secondary disease outcomes. *Mucosal Immunol*. 2021;14\(2\):296-304.](#)

[Shahbazi R, Yasavoli-Sharahi H, Alsadi N et al. Probiotics in Treatment of Viral Respiratory Infections and Neuroinflammatory Disorders. *Molecules*. 2020;25\(21\):4891.](#)

[Stavropoulou E, Kantartzis K, Tsigalou C et al. Unraveling the Interconnection Patterns Across Lung Microbiome, Respiratory Diseases, and COVID-19. *Front Cell Infect Microbiol*. 2021;10:619075.](#)

[Steed AL, Christophi GP, Kaiko GE et al. The microbial metabolite desaminotyrosine protects from influenza through type I interferon. *Science*. 2017;357\(6350\):498-502.](#)

[Trompette A, Gollwitzer ES, Pattaroni C et al. Dietary Fiber Confers Protection against Flu by Shaping Ly6c-Patrolling Monocyte Hematopoiesis and CD8+ T Cell Metabolism. *Immunity*. 2018;48\(5\):992-1005.e8.](#)

[Varela-Trinidad GU, Domínguez-Díaz C, Solórzano-Castanedo K et al. Probiotics: Protecting Our Health from the Gut. *Microorganisms*. 2022;10\(7\):1428.](#)

[Wirusanti NI, Baldridge MT, Harris VC. Microbiota regulation of viral infections through interferon signaling. *Trends Microbiol*. 2022;30\(8\):778-792.](#)

[Woodall CA, McGeoch LJ, Hay AD et al. Respiratory tract infections and gut microbiome modifications: A systematic review. *PLoS One*. 2022;17\(1\):e0262057.](#)

[Zhao Y, Liu Y, Li S et al. Role of lung and gut microbiota on lung cancer pathogenesis. *J Cancer Res Clin Oncol*. 2021 Aug;147\(8\):2177-2186.](#)