

Leaky Gut: When Your Belly Breaks

Pamela Grant, L.Ac, NTP

REFERENCES:

- Anderson, J. M., & Van Itallie, C. M. (2009). [Physiology and function of the tight junction](https://doi.org/10.1101/cshperspect.a002584). *Cold Spring Harbor perspectives in biology*, 1(2), a002584. <https://doi.org/10.1101/cshperspect.a002584>
- Assa, A., Vong, L., Pinnell, L. J., Avitzur, N., Johnson-Henry, K. C., & Sherman, P. M. (2014). [Vitamin D deficiency promotes epithelial barrier dysfunction and intestinal inflammation](#). *The Journal of infectious diseases*, 210(8), 1296-1305.
- Bischoff, S. C., Barbara, G., Buurman, W., Ockhuizen, T., Schulzke, J. D., Serino, M., ... & Wells, J. M. (2014). [Intestinal permeability—a new target for disease prevention and therapy](#). *BMC gastroenterology*, 14(1), 189.
- Fasano A. (2012). [Zonulin, regulation of tight junctions, and autoimmune diseases](https://doi.org/10.1111/j.1749-6632.2012.06538.x). *Annals of the New York Academy of Sciences*, 1258(1), 25–33. <https://doi.org/10.1111/j.1749-6632.2012.06538.x>
- Fasano A. (2012). [Intestinal permeability and its regulation by zonulin: diagnostic and therapeutic implications](https://doi.org/10.1016/j.cgh.2012.08.012). *Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association*, 10(10), 1096–1100. <https://doi.org/10.1016/j.cgh.2012.08.012>
- Feehley, T., Belda-Ferre, P., & Nagler, C. R. (2016). [What's LPS got to do with it? A role for gut LPS variants in driving autoimmune and allergic disease](#). *Cell Host & Microbe*, 19(5), 572-574.
- Fukui, H. (2016). [Increased intestinal permeability and decreased barrier function: does it really influence the risk of inflammation?](#) *Inflammatory intestinal diseases*, 1(3), 135-145.
- Gomes, J. M. G., de Assis Costa, J., & Alfenas, R. D. C. G. (2017). [Metabolic endotoxemia and diabetes mellitus: a systematic review](#). *Metabolism*, 68, 133-144.
- Netea, M. G., Balkwill, F., Chonchol, M., Cominelli, F., Donath, M. Y., Giamarellos-Bourboulis, E. J., Golenbock, D., Gresnigt, M. S., Heneka, M. T., Hoffman, H. M., Hotchkiss, R., Joosten, L., Kastner, D. L., Korte, M., Latz, E., Libby, P., Mandrup-Poulsen, T., Mantovani, A., Mills, K., Nowak, K. L., ... Dinarello, C. A. (2017).
- He, C., Deng, J., Hu, X., Zhou, S., Wu, J., Xiao, D., ... & Wang, Z. (2019). [Vitamin A inhibits the action of LPS on the intestinal epithelial barrier function and tight junction proteins](#). *Food & function*, 10(2), 1235-1242.
- Hietbrink, F., Besselink, M. G., Renooij, W., de Smet, M. B., Draisma, A., van der Hoeven, H., & Pickkers, P. (2009). [Systemic inflammation increases intestinal permeability during experimental human endotoxemia](#). *Shock*, 32(4), 374-378.
- Nagpal, R., & Yadav, H. (2017). [Bacterial translocation from the gut to the distant organs: an overview](#). *Annals of Nutrition and Metabolism*, 71(Suppl. 1), 11-16.
- Netea, M. G., Balkwill, F., Chonchol, M., Cominelli, F., Donath, M. Y., Giamarellos-Bourboulis, E. J., Golenbock, D., Gresnigt, M. S., Heneka, M. T., Hoffman, H. M., Hotchkiss, R., Joosten, L., Kastner, D. L., Korte, M., Latz, E., Libby, P., Mandrup-Poulsen, T., Mantovani, A., Mills, K., Nowak, K. L., ... Dinarello, C. A. (2017). [A guiding map for inflammation](https://doi.org/10.1038/ni.3790). *Nature immunology*, 18(8), 826–831. <https://doi.org/10.1038/ni.3790>
- Odashima, M., Otaka, M., Jin, M., Wada, I., Horikawa, Y., Matsuhashi, T., ... & Watanabe, S. (2006). [Zinc l-carnosine protects colonic mucosal injury through induction of heat shock protein 72 and suppression of NF-κB activation](#). *Life sciences*, 79(24), 2245-2250.
- Tortora, G. J., & Derrickson, B. H. (2017). [Introduction to the human body](#). John Wiley & Sons.
- Wang, W. L., Lu, R. L., DiPierro, M., & Fasano, A. (2000). [Zonula occludin toxin, a microtubule binding protein](https://doi.org/10.3748/wjg.v6.i3.330). *World journal of gastroenterology*, 6(3), 330–334. <https://doi.org/10.3748/wjg.v6.i3.330>
- Wassenaar, T. M., & Zimmermann, K. (2018). Lipopolysaccharides in Food, Food Supplements, and Probiotics: Should We be Worried?. *European journal of microbiology & immunology*, 8(3), 63–69. <https://doi.org/10.1556/1886.2018.00017>