

Biofilms are communities of microbes hidden within protective extracellular matrixes.^{1,2} Understanding biofilms is essential for several reasons:

- **Cooperation:** Biofilms allow for the organization of complex communities of microorganisms.
- **Protection:** Biofilms shield these communities from surrounding environmental conditions. This allows them to evade the immune system, antimicrobial agents, and other microbes.
- **Treatment Resistance:** Biofilms contribute to antibiotic resistance, which makes comprehensive treatment more difficult.

The GI-MAP test helps practitioners detect hidden pathogens and opportunistic microbes within biofilms. By identifying and targeting biofilm-forming microbes, practitioners can enhance their approach to gut health, resulting in more precise and effective interventions. Biofilm disruptors may be useful as part of a comprehensive protocol.

Biofilm Formers on GI-MAP

Biofilm Formers ^{3,4}		
<i>Bacillus</i> spp.	<i>Citrobacter</i> spp. <i>Citrobacter freundii</i>	<i>Fusobacterium</i> spp.
<i>Enterococcus</i> spp.	<i>Klebsiella</i> spp. <i>Klebsiella pneumoniae</i>	<i>Prevotella</i> spp.
<i>Morganella</i> spp.	<i>Mycobacterium avium</i> subsp. <i>paratuberculosis</i>	<i>Helicobacter pylori</i>
<i>Pseudomonas</i> spp. <i>Pseudomonas aeruginosa</i>	<i>Proteus</i> spp. <i>Proteus mirabilis</i>	<i>Candida</i> spp.
<i>Staphylococcus</i> spp. <i>Staphylococcus aureus</i>	<i>Enterobacter</i> spp.	
<i>Streptococcus</i> spp.	<i>Escherichia</i> spp.	

REFERENCES

1. Yan J, Bassler BL. Surviving as a Community: Antibiotic Tolerance and Persistence in Bacterial Biofilms. *Cell Host Microbe*. 2019;26(1):15-21. doi:10.1016/j.chom.2019.06.002
2. Roy R, Tiwari M, Donelli G, Tiwari V. Strategies for combating bacterial biofilms: A focus on anti-biofilm agents and their mechanisms of action. *Virulence*. 2018;9(1):522-554. doi:10.1080/21505594.2017.1313372
3. Anderson GG, O'Toole GA. Innate and induced resistance mechanisms of bacterial biofilms. *Curr Top Microbiol Immunol*. 2008;322:85-105. doi:10.1007/978-3-540-75418-3_5
4. Baumgartner M, Lang M, Holley H, et al. Mucosal Biofilm Are an Endoscopic Feature of Irritable Bowel Syndrome and Ulcerative Colitis. *Gastroenterology*. Oct 2021;161(4):1245-1256.e.20. doi:10.1053/j.gastro.2021.06.024

Uncover Hidden Biofilms with GI-MAP Today!

