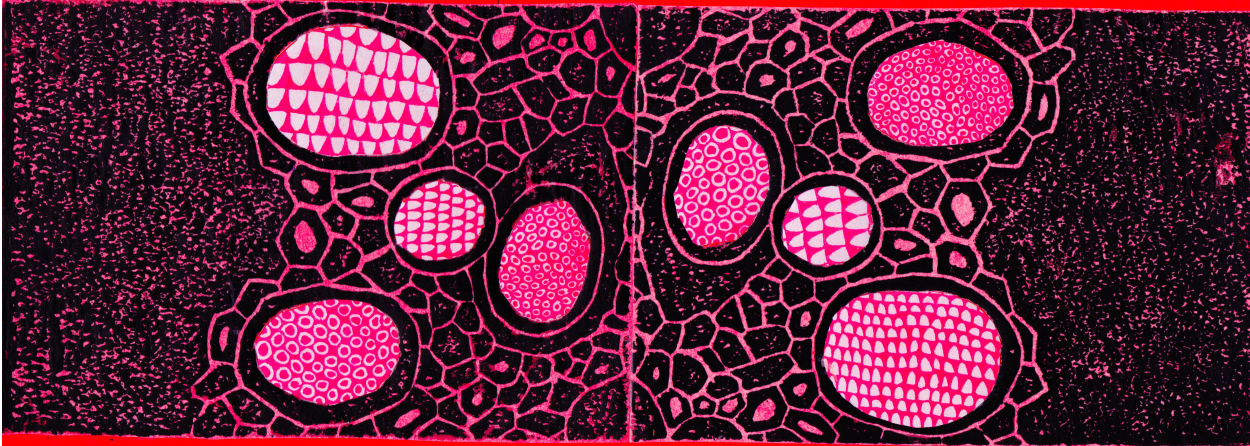


LISTERIA



Hello! Let me tell you a little but about myself. I am Listeria, a gram positive, rod shaped bacteria that does not have an outer cell membrane. I often appear in short chains with other Listeria, but can survive on my own too. I am considered a pretty rare type of food poisoning, so I wouldn't say I am the most famous among bacteria, but I do think I am misunderstood among those who know of me. People think just because I am a food borne illness that can kill humans I am purely a negative

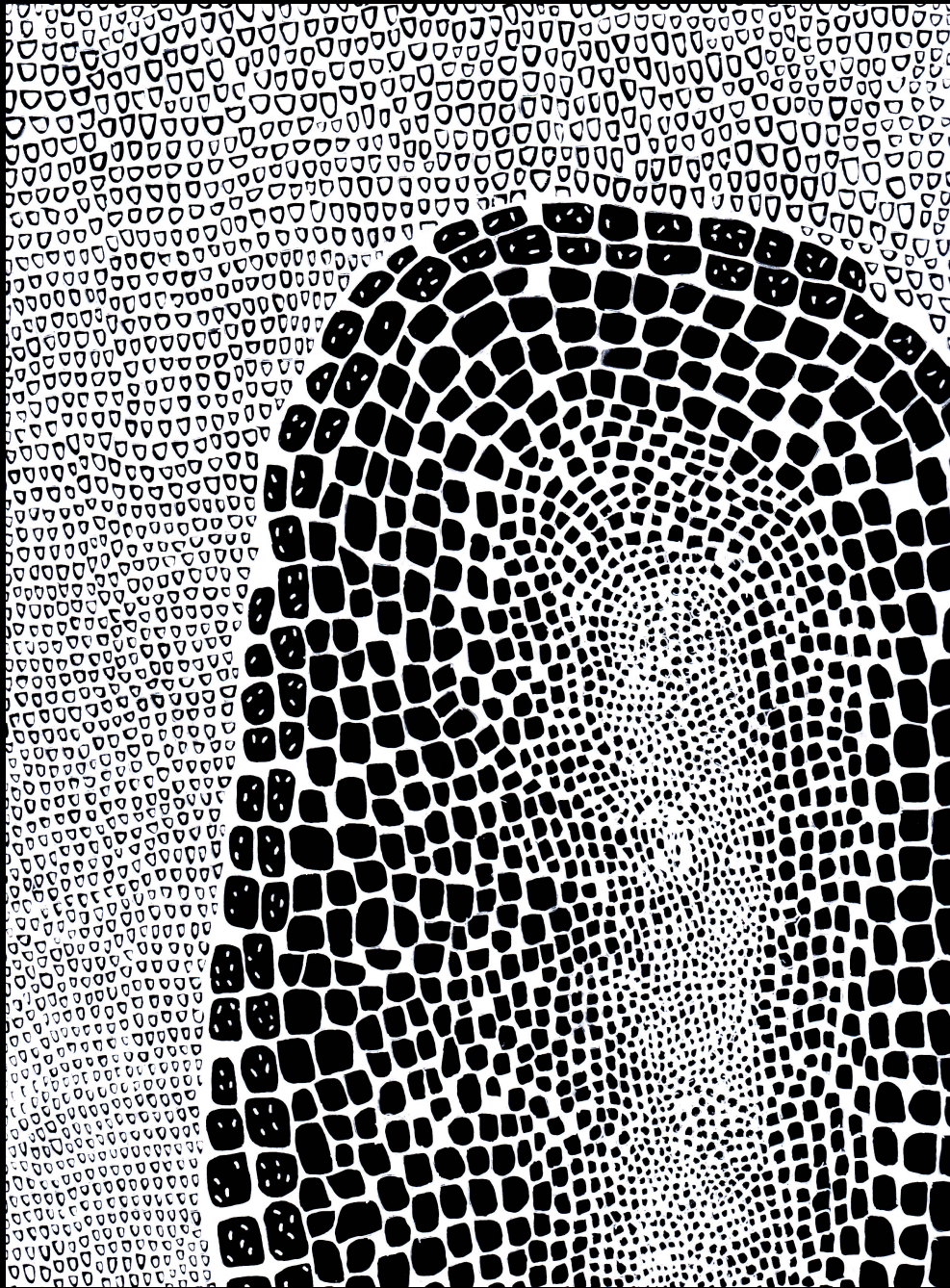
life form. I just want people to know that there is more to me than my affect on humans! I am a beautiful organism, with physical and functional complexities.

I am an anaerobic bacteria, which means I can survive in the presence or absence of oxygen. I can often be found in improperly processed deli meats and unpasteurized milk products,



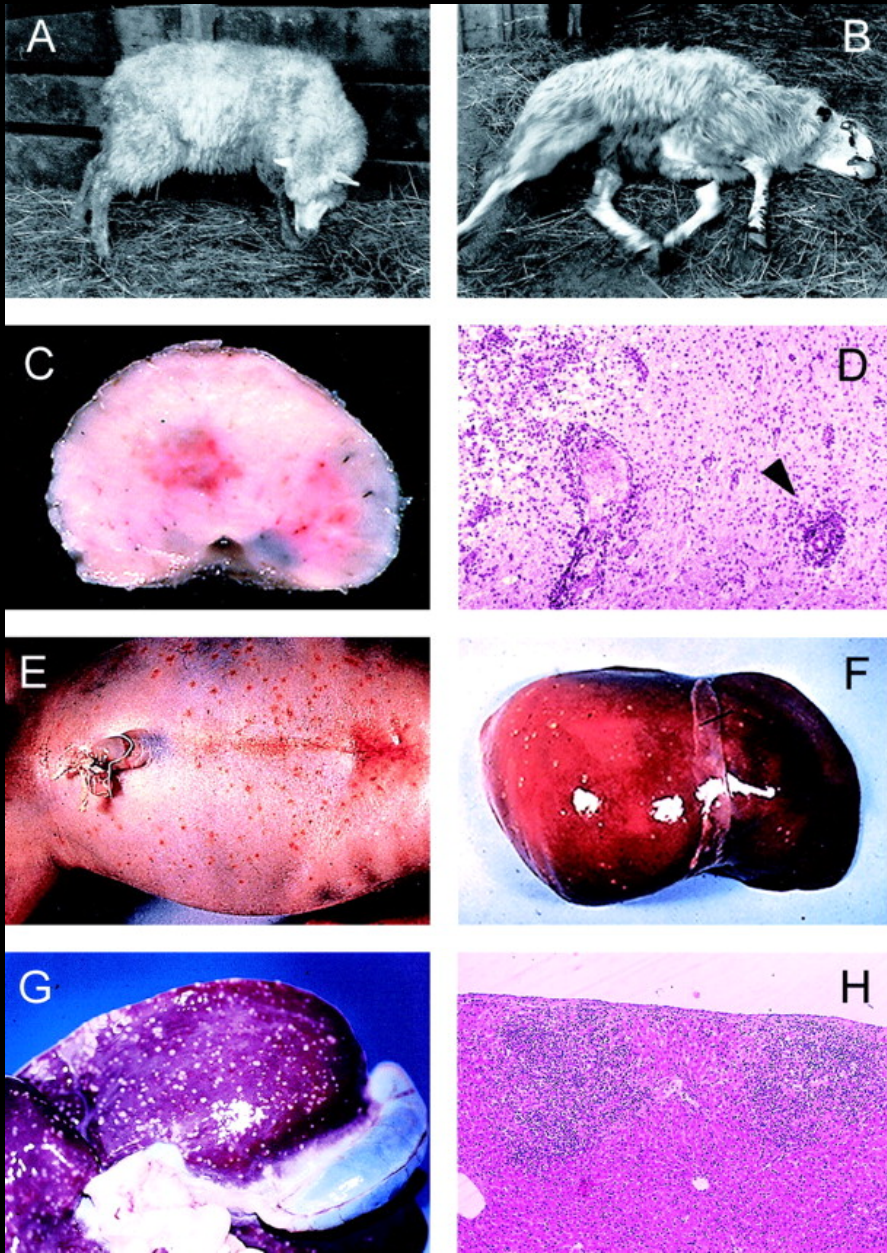
as well as soil, water, and animal feces. I am most commonly contracted when humans ingest me through their food. I can survive refrigeration and even freezing, and can grow and reproduce inside a host's cells! Other extreme conditions I can

survive are environments with high salinity, high pH, and high temperatures. I am motile, meaning I can move around, but I do not form spores. Once I enter a host, I have a virulence factor that allows me to propel myself through the cytoplasm of an

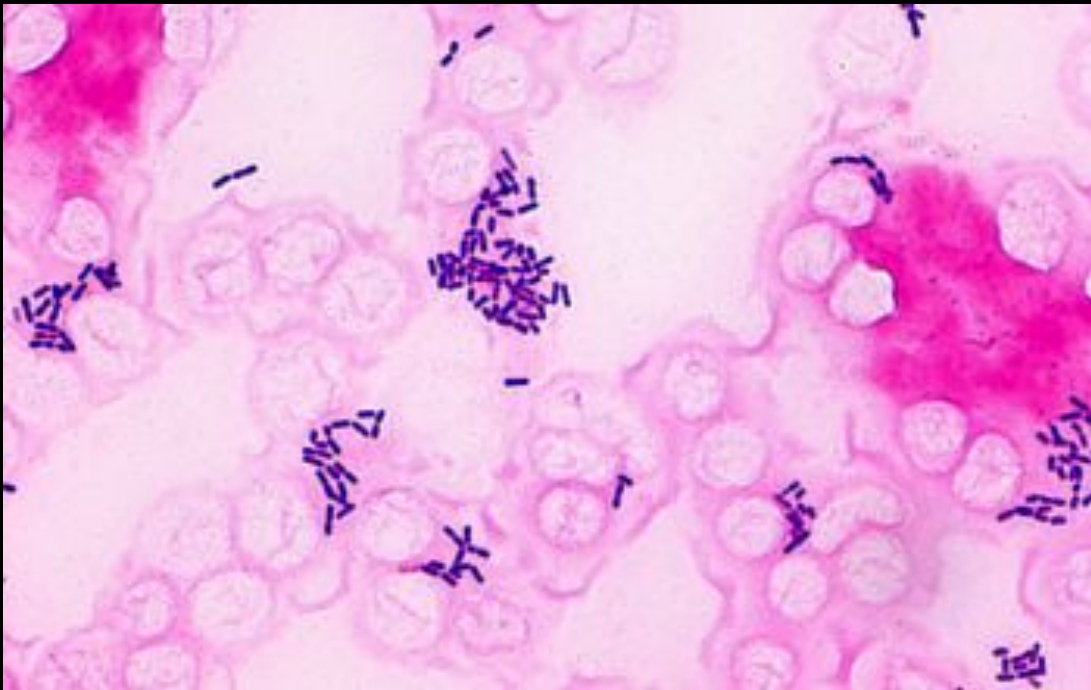


infected cell by forming a tail. I sometimes produce a biofilm,

which allows me to attach to solid surfaces, and become extremely difficult to remove. Pregnant women and people with weak immune systems are at the highest risk of contracting me. Humans can be treated with antibiotics once I infect them in order to get rid of me.



Anyway, that's enough talking about my affect on humans. As I stated before, I want you to get to know more about my cool abilities. I have evolved efficient strategies to survive in the small intestine and cross the intestinal, blood-brain and intestinal barriers. I co-opt cell's machinery and travel through the blood stream to make my way to the gastrointestinal tract. My clinical manifestations include meningitis, meningoencephalitis, septicemia, abortion, perinatal infection, and gastroenteritis. I have multiple fermentation pathways which



allows me to have an altered carbon metabolism depending on my living conditions. In the presence of oxygen I am unable to completely oxidize glucose to acetate, lactate, and acetone. In the absence of oxygen I produce lactate as my major fermentation product along with ethanol, formate, and carbon dioxide.

I like to apply my evolved strategies to everyday life. My typical home is in the soil. However, I love to go on vacation. When I feel like getting away I will usually attach myself to vegetables being grown in the soil. When humans or animals ingest the food that is grown in the soil I get to take a vacation in their body's, and perform my strategies on their cells!



When people refer to Listeria, they are most likely referring to me: *Listeria monocytogenes*. However, I have family members too. The genus, *Listeria*, is comprised of 17 species, including 9 that were newly discovered in 2009. Genomic and phenotypic data clearly define a distinct group of six of our species (*Listeria sensu strictu*) that share common phenotypic

characteristics (e.g., ability to grow at low temperature, flagellar motility); this group includes the pathogen *Listeria monocytogenes*. The other 11 of our species (*Listeria sensu lato*) represent three distinct monophyletic groups, which may warrant recognition as separate genera. These three proposed genera do not contain pathogens, are non-motile (except for *Listeria grayi*) among other differences.

Even though I can cause a lot of harm to humans, I can also be of use. Scientists are now researching how I can be used in cancer treatments, because of my abilities of having both innate and adaptive ways of surviving. I hope that through spreading this information about me, I can be seen in a better light, and be appreciated for my complexities. I am not merely a killer, but an intelligent and adaptable organism.

Works Cited

"Listeria." Microbewiki, microbewiki.kenyon.edu/index.php/Listeria.

"Listeria Infection." Mayo Clinic, Mayo Foundation for Medical Education and Research, 8 Feb. 2017, www.mayoclinic.org/diseases-conditions/listeria-infection/symptoms-causes/syc-20355269.

Orsi, Renato H, and Martin Wiedmann. "Characteristics and Distribution of Listeria Spp., Including Listeria Species Newly Described since 2009." *Applied Microbiology and Biotechnology*, Springer Berlin Heidelberg, 2016, www.ncbi.nlm.nih.gov/pmc/articles/PMC4875933/.

Wallace, Nathan, et al. "Metabolic Determinants in Listeria Monocytogenes Anaerobic Listeriolysin O Production." *Archives of Microbiology*, Springer Berlin Heidelberg, 2017, www.ncbi.nlm.nih.gov/pmc/articles/PMC5504256/.