**Immunity in Nature**

In a laboratory bacteria facing increasingly powerful barriers of antibiotics between them and a source of food took less than two weeks of dying in large numbers but survivors mutating sufficiently to pass through these antibiotic barriers and enjoy their feast.

Rob Dunn, *Never Home Alone* (Basic Books, 2018).

Our eco-choice lesson? Trying to kill bacteria with antibiotics will inevitably generate bacteria that are resistant to the antibiotics. Therefore, this should almost never be our choice, because it is not a sustainable choice.

What eco-choices do we have?

Our bodies’ immune systems have evolved to capture and kill bacteria that enter our bodies and pose a threat to our health. This is happening all the time. *Vaccines help our immune systems focus on a known threat,* such as COVID-19. Choosing to be vaccinated strengthens our immune systems.

Our human immune system is nature’s way of evolving to protect us from bacteria and other microbes that attack our cells after entering our body in the food or liquid we ingest or the air we breathe.

Living More Ecologically

Debra Levey Larson of the University of Illinois College of Agricultural Consumer and Environmental Sciences says research “has found evidence that spending time in nature provides protections against a startling range of diseases, including depression, diabetes, obesity, ADHD, cardiovascular disease, cancer, and many more.”

Her colleague Ming Kuo explains: “One way to understand this relationship between nature, health, and the immune system is that exposure to nature switches the body into ‘rest and digest’ mode, which is the opposite of the ‘fight or flight’ mode. When we feel completely safe, our body devotes resources to long-term investments that lead to good health outcomes – growing, reproducing, and building the immune system.”

[https://www.sciencedaily.com/releases/2015/09/150916162120.htm](https://www.press-citizen.com/story/opinion/2022/01/03/opinion-covid-careless-have-no-right-ignore-our-rights/8972160002/)

Ian Tizard of the College of Veterinary Medicine and Biomedical Sciences at Texas A&M University explains that, like humans: “Animals are under constant threat of microbial invasion. These potential invaders gain access to the body through the intestine and respiratory tract and the skin. The large and diverse microbiota of the intestine serves to protect the intestine from infectious invaders by occupying a niche that precludes other organisms from establishment there.

To prevent microbial invasion, animal immune defenses “include physical barriers such as the skin, which has its own microbiota” that desiccate (dry up) invading micro-organisms. “Inhaled microorganisms and other material are rapidly removed by the mucociliary apparatus, which consists of ciliated epithelial cells and mucus-secreting cells that move inhaled material from the lower to the upper respiratory tract from which they are removed by the cough reflex.

“The second line of defense is a ‘hard-wired’ system of innate immunity that depends on a rapid stereotypical response to stop and kill both bacteria and viruses. This is typified by the process of acute inflammation and by the classic illness responses such as a fever.

"The third line of defense is the highly complex, specific, and long-lasting adaptive immunity. Because an animal accumulates memory cells after exposure to pathogens, adaptive immunity provides an opportunity for the host to respond to exposure by creating a highly specific and effective response to each individual infectious agent.”