**Healing Virus**

Daphne Miller, clinical professor at the University of California at San Francisco, writes in “Most viruses around us are benign; some are even lifesaving,” that she successfully treated a patient with a hip infection that antibiotics could not cure with a virus capable of destroying the bacteria. Known as “bacteriophage” or “phage” for short, phages able to destroy bacteria were identified before penicillin.

“Bacteriophages are probably the most abundant and diverse entity on the planet,” Miller writes, “and identifying which were most effective against a particular bacterial infection was difficult. Dosing was also challenging since phages continue to replicate, so their quantity is not constant. Given these hurdles, it’s understandable that doctors in most places abandoned phage therapy when penicillin and other chemical antibiotics became widely available. Antibiotics were shelf-stable, dependably dosed, mass produced and one formulation could kill a wide range of invaders.”

Now, however, that antibiotic resistance is widespread, some physicians are evaluating the use of phages because of “their dynamic nature, complexity, specificity, and diversity.” The very reasons for previously ignoring them.

“While antibiotics offer fewer than two dozen mechanisms for killing bacteria, phages have vastly more. There are thousands of types of phages that can infect each bacterial species, making it nearly impossible to resist all of them. And even when the phage treatment does not kill the bacteria, it can force an ‘evolutionary trade-off’ that often makes it more vulnerable to antibiotics.”

Scientists have verified that “the trillions of microbes that we harbor in our gut and others” actually “control everything from how we digest our food to how we feel.” Bacteria have been the focus for attention in this research, but more recently scientists have learned that ‘bacteriophages within us might play a singular role in protecting our health.’ For example, test results have confirmed that phages identified in the stools of healthy donors are very likely crucial in treating ‘recurrent and debilitating diarrhea cause by the bacterium Clostridium difficile.’ Also, there is evidence that phages in our bodies communicate with our immune cells.

A “healthy” virome (like a healthy microbiome) in our gut requires significant diversity. In short, we should eat less food containing preservatives, sugar, and artificial sweeteners, and instead consume a greater diversity of plants.

Paul Turner, Rachel Carson Professor of Evolutionary Biology and Ecology at Yale University, argues that we must protect wilderness “places that host the greatest diversity of animals and plants,” if we are also to discover diverse phages that may someday save human lives.

Daphne Miller, “Most viruses around us are benign; some are even lifesaving,” *The Washington Post*, Mar. 13, 2021, https://www.washingtonpost.com/health/most-viruses-around-us-are-benign-some-are-even-lifesaving/2021/03/12/cd833cc0-76bc-11eb-948d-19472e683521\_story.html.