

American Academy of Microbiology releases resistance report

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What do cancer cells, weeds, and pathogens have in common? They all evolve resistance to the treatments that are supposed to eliminate them. However, researchers developing the next generation of antibiotics, herbicides, and anti-cancer therapeutics rarely come together to explore the common evolutionary principles at work across their different biological systems.

The new American Academy of Microbiology report "Moving Targets: Fighting Resistance in Infections, Pests, and Cancer" concludes that scientists working on different kinds of treatments have much to learn from each other. Applying lessons learned about the evolution of resistance in different biological systems during the earliest stages of drug and pesticide design could lead to more effective treatments for patients, farmers, and [public health organizations](#).

Do you think the [oncologists](#) at a cutting-edge research hospital ever sit down with local farmers? Do you think the pharmaceutical researchers developing the next generation of anti-[HIV drugs](#) spend any time with the plant scientists working on the next generation of Roundup Ready soybeans? If your answer to both questions is no, you would be mostly right. Even though all of these people are dealing with exactly the same evolutionary phenomena, they do not recognize themselves as a single scientific community and rarely get a chance to learn from each other. What they all have in common is that they are trying to eliminate an unwanted living entity but the treatments they develop eventually lose effectiveness because the target evolves resistance.

The emergence of resistance is a phenomenon with ancient evolutionary roots, although the human role in triggering resistance was little appreciated before the advent of widespread antibiotic and [pesticide use](#) in the 1950s. In *Silent Spring*, the prescient Rachel Carson wrote in 1962 that "by their very nature chemical controls are self-defeating, for they have been devised and applied without taking into account the complex [biological systems](#) against which they have been blindly hurled." Sadly, in the fifty years since *Silent Spring* was published, biologists, doctors, and farmers continue to be plagued with resistance evolution by the species they seek to control. This phenomenon is witnessed in medicine in the emergence of antibiotic resistance and when tumors become intractable to standard anti-cancer medications, in agriculture when insecticides and [herbicides](#) lose effectiveness, and in public health when disease-carrying insects develop resistance to control strategies. The report "Moving Targets: Fighting Resistance in Infections, Pests, and Cancer" makes clear that a multi-disciplinary approach to the phenomenon of resistance can be very powerful.

More information: A PDF of Moving Targets can be found here: bit.ly/XaKaSY.

Provided by American Society for Microbiology

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