A Ballooning Reservoir

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The viral reservoir, whose stubborn presence is the main reason why attempts to cure HIV with standard antiretrovirals fall flat, may be as much as 60 times larger than scientists once conceived.

The reservoir is made up of resting, or non-replicating, cells that have HIV's genetic code integrated into their DNA. When researchers try to activate these cells in test tube research, during a process known as "shock and kill," less than one percent of the cells are aroused and begin replicating—thus exposing them to elimination.

Studying the cells that remain in a latent state during these activation attempts, researchers discovered that, contrary to the traditional perception that they are defective, many of them actually have the capacity to replicate normally. This complicates cure attempts in two key ways. First, these cells can therefore evade shock and kill, but still replicate if treatment is stopped. And second, because the cells pose this threat they must be considered a part of the reservoir, making the entity much more vast than previously thought.

Robert F. Siliciano, PhD, MD, a professor of medicine at Johns Hopkins University School of Medicine who is the study's senior author, is taking in stride his team's findings, which have otherwise caused many gloomy headlines. Much of cure research these days, after all, is devoted to a search and discovery process of developing ways to accurately measure and characterize the reservoir.

"We just need a realistic idea of what we're up against," he says. "I think the cure cases—the Berlin Patient, the Mississippi Baby—have gotten everyone very excited, but they were very special cases. And for most people, we have to prepare ourselves that we don't have a way to [cure them] now and it's going to take a long time to do it."

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