

Researcher probes why viruses remain genetically stable for some time, then rapidly mutate

Unlike most kids, Katia Koelle's first love was math, a passion she picked up from enthusiastic instructors.

"One of my high school teachers was so excited he would jump around the room," Koelle says. Now an evolutionary biologist at Duke University, she's using math to reveal how [infectious diseases](#) evolve and spread.

Koelle builds models that merge data from unfolding epidemics with information about pathogens and the human immune system. She also studies the genes of viruses to determine why they mutate. Her holistic strategy provides clues to puzzles that have long stymied researchers. For example, flu viruses seem to remain relatively stable for years, only to suddenly evolve into a more deadly form. Koelle's models show that they pick up a range of mutations over time—

potentially setting them up for a significant change. Now, she's exploring why certain areas of the world are [hotspots for generating outbreaks](#).

Read the full, original story: [The brilliant 10: Katia Koelle models how viruses turn deadly](#)