Antibiotics, Farming and Superbugs

Curious Cat Science and Engineering Blog

Antibiotics and farming – how superbugs happen [1]
Provocative new research from Boston University's medical school and department of biomedical engineering now suggests, though, that multi-drug resistance can be acquired in one pass, through a different mutational process triggered by sublethal doses of antibiotics [2] – the same sort of doses that are given to animals on farms. In earlier work, the authors found that antibiotics attack bacteria not only in the ways they are designed to (the beta-lactams such as methicillin, for instance, interfere with staph's ability to make new cell walls as the bug reproduces, causing the daughter cells to burst and die), but also in an unexpected way. They stimulate the production of free radicals, oxygen molecules with an extra electron, that bind to and damage the bacteria's DNA.

That research used lethal doses of antibiotics, and ascertained that the free-radical production killed the bacteria. In the new research, the team uses sublethal doses, and here's what they find: The same free-radical production doesn't kill the bacteria, but it acts as a dramatic stimulus to mutation, triggering production of a wide variety of mutations

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