

Goodbye to Antibiotic Resistance

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Claude Bernard is reported as saying the he could eat Pasteur's anthrax with impunity. Not many today have his nerve; we have gone down Pasteur's pathway where the fearful germs are the focus, and all our efforts are aimed at destroying them. Following that path has led to much success, but also to a lot of resistant bacteria as they increase their mutation rate and find ways around or through our increasingly powerful antibiotics. Judging from evolutionary history we have little chance of winning this war: 99% of higher evolved species are now extinct while 99% of archaic bacteria from 2 billion years ago are still around. Nor, perhaps should we want to. Bacteria are the worlds's recyclers. Life old be impossible without them. We think we should look at ways to live with these recyclers in a better way, and Bernard's idea may be where to start.

Bernard focused on the soil where the bacteria grew; in the case of infectious diseases that soil would be you and me. In the processes of evolution we have developed defenses that help us stay healthy in the midst of these agents who want to recycle our bodies before we are quite ready. If these defenses are optimal we can stay healthy a bit longer; maybe even healthy enough to eat the anthrax.

Our defenses are strongest where they are needed the most—at the entrances of our body where we eat and drink, breathe, eliminate, and reproduce—and it is relatively easy to make them stronger, even to optimize them. Doing so brings into play the same forces that push the bacterial recyclers to adapt in friendlier ways, described by Paul Ewald as happening when we interrupt their transmission. Ewald shows that when me make it harder for bacteria to get from person to person it puts pressure on them to adapt in friendly ways, toward living in harmony with their host—it's called commensalism. interfering with the ability of these bacteria to adhere to their human host applies this same pressure. This is what many of defenses do already. In other words optimizing our defenses is negotiating a win-win solution for both us and our recyclers. So how do we do this?

Oral rehydration optimizes our secondary GI defense of gastroenteritis. Diseases as severe as cholera can be washed out effectively if the tank is kept full, which is what oral rehydration does, easily, efficiently and safely. And a 'sugar' like xylitol unhooks nasal pathogens and works osmotically to optimize the respiratory defense made up of the mucus that grabs on to all of the foreign material in the air we breathe and the cilia that sweep it out.

The problem is these measures use common foods and not drugs: oral rehydration is the proper combination of sugar, salt and water, and xylitol is widely available as a sugar substitute. Without jumping through FDA hoops those marketing these foods cannot make medical claims that are clearly appropriate nor educate the population about their benefits, so few know about them. Do your own research, begin negotiating now, and we can say goodbye to resistance by 2030; and you will be healthier in the process.