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## A solution to the antibiotic resistance crisis

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Pharmacology has focused on the effects of compounds on tissues and organs with a view to promoting the well-being of a patient. This has been a special case of 'reality'. With the dual realization that these compounds can also have effects on microorganisms living in and on the patient and that these microorganisms play a vital role in maintaining the health of the patient, it is essential that we modify our perspective into a general theory for pharmacology. We must consider the effect of compounds on both the patient and his or her microbiome and the interactions between them. One important example is chlorpromazine (a phenothiazine) which was used to treat mental diseases in the beginning of the 1950's, which 'by accident' also cured patients for tuberculosis. Patients with stomach ulcers were successfully treated with trimipramine (an antidepressant), long before it was realized that compound was affecting the causative agent: a *Helicobacter pylori* infection. Numerous 'classical' pharmacological compounds have been shown to act as antibiotics or antibiotic adjuvants and are now referred to as "helper compounds" or "non-antibiotics. The importance of this field becomes clear when one considers that specific non-antibiotics can be used to successfully treat seriously resistant infections were currently antibiotics which are ineffective. In other words non-antibiotics offer an unexploited solution to the antibiotic resistance crisis that hospitals are currently facing.

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