

Science & Technology Concentrates

## Bleach Kills Bacteria On Multiple Fronts

**Two studies reveal how hypochlorous acid, HOCl, the active ingredient in bleach, can kill bacteria by different mechanisms**

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The battle between bleach and bacteria is unequal, and two research groups think they have discovered some reasons why. People use hypochlorous acid (HOCl), the active ingredient in bleach, to rid their homes of bacteria. Immune cells in mammals carry out their own version of this housekeeping by engulfing invading bacteria and killing them with HOCl. Melanie S. A. Coker of the [University of Otago](#), in Christchurch, New Zealand, and colleagues propose that HOCl released by immune cells reacts with amine groups in the cells' proteins. They believe this reaction creates unstable amino acid dichloramines that then release  $\text{NH}_2\text{Cl}$  and  $\text{NHCl}_2$ , which kill bacteria (*Chem. Res. Toxicol.*, DOI: [10.1021/tx800232v](#)). [Ursula Jakob](#) of the University of Michigan, Ann Arbor, and coworkers proffer an additional explanation for bleach's antibacterial success. They report that HOCl oxidizes bacterial proteins that then unfold and aggregate, helping to kill the bacteria (*Cell* **2008**, *135*, 691). Bacteria fight back by activating a heat shock protein that limits this aggregation, although this defense only works up to a point.