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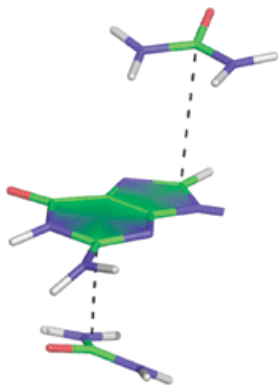
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Urea-RNA Disruption

[Stuart A. Borman](#)

Courtesy of Changbong Hyeon

Urea (top and bottom) disrupts RNA by forming stacking interactions with its bases.

Scientists have made a fundamental advance in biochemistry by using simulations to discover a new type of interaction between urea and RNA (*J. Am. Chem. Soc.*, DOI: 10.1021/ja905795v). Urea has long been used to denature proteins, and it was recently found to destabilize RNA. Studies have shown that urea disrupts proteins by interacting with their peptide backbones and hydrophobic side chains, but the mechanism by which it aggravates RNA remained unknown. A team led by [Devarajan \(Dave\) Thirumalai](#) of the University of Maryland, College Park, and [Alexander D. MacKerell Jr.](#) of the University of Maryland, Baltimore, now reports all-atom molecular dynamics simulations that reveal how urea hydrogen bonds and stacks with RNA's bases, making normal interaction between bases impossible. "The microscopic mechanism of chemical denaturants has bedeviled the protein- and RNA-folding fields for decades," comments [Tobin R. Sosnick](#) of the University of Chicago. "The stacking interaction is unexpected and an important insight."

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