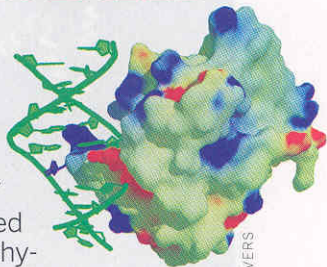


DNA REPAIR PROCESS REVEALED

By using chemical, crystallographic, and NMR techniques, James T. Stivers and coworkers at Johns Hopkins Medical School have established the recognition mechanism that the enzyme uracil DNA glycosylase uses to carry out a key DNA repair—removing unwanted uracil bases from the genome (*Nature*, DOI: 10.1038/nature06131). The mechanism involves thermally induced base-pair “breathing,” a type of DNA motion that ejects thymine (red spheres at center) and uracil into a “sieving pocket” on the enzyme (shown). This process enables the enzyme to discriminate effectively between thymine and uracil, which have very similar structures. “Previous studies of extrahelical base recognition will now need to consider spontaneous base-pair breathing dynamics as an initiating event” for DNA repair instead of previously proposed initiation mechanisms based on enzyme motions, Stivers says. He adds that the results “highlight the importance of using complementary methods to establish mechanisms” because crystal structures alone are incapable of revealing the order of events.



COURTESY OF JAMES STIVERS