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Hopping along DNA

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Oxidative damage yields isolated electrons and their corresponding 'holes' that can migrate along DNA. In the 6 July *Nature* Lewis *et al.* determine rate constants of $\sim 5 \times 10^7 \text{ s}^{-1}$ and $5 \times 10^6 \text{ s}^{-1}$, respectively, for forward and return hole transport from a single guanine base to a double guanine base across a single adenine (*Nature* 2000, **406**:51-53). These rates mean that electrons do not linger long enough to participate in strand-cleavage reactions. But the electrons move too slowly to avoid charge recombination, so DNA cannot act as a useful molecular wire.

References

1. Distance-dependent electron transfer in DNA hairpins.
2. *Nature*, [<http://www.nature.com/nature/>]