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Watch out for the neighbors

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Radiation induces DNA breaks, leading to chromosomal rearrangements. But do the breaks come first, followed by a wandering through the nucleus to find a suitable partner for the free DNA end? Or is the partner already nearby at the time of the break? In the 6 October *Science*, Nikiforova *et al.* provide evidence for the latter theory (*Science* 2000, **290**:138-141). They look at papillary thyroid cancer, in which a radiation-induced inversion often fuses the genes for H4 and the RET receptor tyrosine kinase. In normal thyroid cells the genetic distance between these two genes is 30 Mb, but Nikiforova *et al.* find that in 35% of thyroid cells the genes are physically very close together. The restriction of the RET-H4 rearrangement to thyroid cancers (and not lymphomas or breast cancers) may have two different explanations. Lymphocytes, at least in mice, are not transformed by activated RET, and mammary epithelial cells do not show association of the RET and H4 genes.

References

1. *Science magazine*, [<http://www.sciencemag.org/>]
2. Oncogenic rearrangements of the RET proto-oncogene in papillary thyroid carcinomas from children exposed to the Chernobyl nuclear accident.