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Somatic hypermutation

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Somatic hypermutation, gene conversion and class-switch recombination are genetic rearrangements that generate the molecular diversity of immunoglobulin genes underlying the human immune system. In the June 14 *Science*, Yoshikawa *et al.* report that a single enzyme, activation-induced cytidine deaminase (AID), is sufficient to generate somatic hypermutation in fibroblasts cells (*Science* 2002, **296**:2033-2036). To examine hypermutation, they created an NIH3T3 fibroblast cell line expressing a tetracycline-regulated mutant green fluorescent protein (GFP) gene containing a premature stop codon. They were able to select GFP-positive cells (around 1-1.8% of cells) following introduction of functional AID, but not an inactive AID isoform. The mutation rate increased with the level of transcriptional induction of GFP. Yoshikawa *et al.* found large numbers of mutations in the *GFP* gene when the target gene was transcribed (4.5×10^{-4} mutations per base pair per generation). The type of AID-induced mutations resembled those of somatic hypermutation of immunoglobulin genes.

References

1. Somatic hypermutation.
2. *Science*, [<http://www.sciencemag.org>]