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Doing the genome shuffle

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DNA shuffling mimics an accelerated evolutionary process that selects for improved individuals. DNA shuffling allows for recombination between multiple parents at each generation, resulting in 'complex progeny' and faster selection. In the February 7 *Nature* Ying-Xin Zhang and colleagues at Maxygen in California describe using a whole-genome shuffling approach to derive new bacterial strains (*Nature* 2002, **415**:644-646). They chose to shuffle *Streptomyces*, used to produce commercial antibiotics. Zhang *et al.* carried out repeated rounds of protoplast fusions on mixtures of four *Streptomyces* strains and demonstrated that genome shuffling could accelerate directed evolution. They applied the method to *Streptomyces fradiae* strains that produce the antibiotic tylosin, and generated superior tylosin-producing strains after just two rounds of genome shuffling - much faster than traditional sequential random mutagenesis methods.

References

1. DNA shuffling of subgenomic sequences of subtilisin.
2. *Nature*, [<http://www.nature.com>]
3. Maxygen , [<http://www.maxygen.com/maxy>]