
Oligonucleotide-Directed Mutagenesis

'Matchmaking and single mismatching'

Mutations are essential for life as we know it. Without mutations, there would be no evolution and no biodiversity. The variation created by natural mutations has also been the basis for all plant breeding since we started cultivating plants many thousand years ago. Then starting in the 1930s, scientific progress enabled us to use radiation and chemicals to induce mutations and thereby increase the genetic variation available for plant breeding. The more recent exploitation of *oligonucleotide-directed mutagenesis (ODM)* has now made mutation breeding more precise and efficient than ever before. Compared to the randomness of mutations induced by radiation or chemicals, this technique employs a complementary nucleotide sequence to introduce a mutation at a very specific location in the genome.



Benefits

ODM creates a mutation exactly where it is needed, greatly enhancing the precision, efficiency and speed of breeding. Earlier mutation breeding based on radiation or chemicals was essentially a random approach blasting thousands of seeds to induce countless mutations and then trying to cherry-pick the rare few mutations that were beneficial. A much smaller plant population is then sufficient to improve a particular trait with ODM. ODM also avoids the tedious 'cleaning up' procedure that is necessary in random mutation breeding to get rid of all the unwanted mutations through generations of backcrossing.

