### Introduction

The genus Brassica

The genus *Brassica* consists of over thirty wild species and hybrids or morphotypes. Generally, species from the genus *Brassica* are used in food like broccoli, cauliflower, cabbage and more.

The *Brassica* genome has undergone more polyploidy than *Arabidopsis thaliana*. *Arabidopsis thaliana* is notable for being a model organism because of its complexity paired with a relatively small genome.

Duplication Events

The *Brassica* genome has undergone two tetraploidy and two hexaploidy events, one more than *Arabidopsis*, since the eudicot paleohexaploidy event which gave rise to *Vitis*, *Prunus*, *Arabidopsis*, and *Brassica*.

Triangle of U

The “Triangle of U” theory describes the genetic relationship between six species of *Brassica: Brassica rapa, Brassica nigra, Brassica oleracea, Brassica juncea, Brassica carinata, and Brassica napus. B. juncea, B. carinata, and B. napus* are all allotetraploids, hybrids with four times the chromosome set of haploids.

UGT Gene Family

UGT functions

Uridine diphosphate (UDP) glycosyltransferases (UGTs) mediate transfer of glycosyl residues from activated nucleotide sugars to acceptor molecules (**[Tang](http://journal.frontiersin.org/article/10.3389/fpls.2012.00172/abstract" \t "_blank)**[, Unleashing the Genome of the](http://journal.frontiersin.org/article/10.3389/fpls.2012.00172/abstract" \t "_blank)*[Brassica rapa](http://journal.frontiersin.org/article/10.3389/fpls.2012.00172/abstract" \t "_blank)*). They provide instructions for making enzymes that perform the process of glucuronidation, the addition of glucuronic acid to a substrate (**[Genetics Home Reference](http://ghr.nlm.nih.gov/geneFamily/ugt" \t "_blank)**[, UGT gene family](http://ghr.nlm.nih.gov/geneFamily/ugt" \t "_blank)).

UGT Chemistry

By mediating transfer of glycosyl residues from activated nucleotide sugars to acceptor molecules, UGTs regulate properties of those acceptors such as bioactivity, solubility and transport within cells and throughout organisms (**[Ross](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC138907/" \t "_blank)**[, Higher plant glycosyltransferases](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC138907/" \t "_blank)).

**Methods**