

World's first blue rose developed

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Australian and Japanese researchers have demonstrated the application of RNAi (gene silencing) technology for gene replacement in plants, developing the first blue rose in the world. Till date, breeders have attempted to make true blue roses over many years, but none have successfully bred roses with blue pigment.

The RNAi technology developed by the Commonwealth Scientific and Industrial Research Organization (CSIRO) was a key technology used under license by Florigene, a Melbourne-based biotechnology company and part of the Japanese Suntory group of companies to develop the rose.

In order to develop a blue rose with a "true blue" pigment, three steps had to be achieved: turn off the production of red pigment; open the 'door' to production of blue pigment; and then produce blue pigment. The RNAi technology was used to remove the gene encoding the enzyme dihydroflavonol reductase (DFR) in roses. DFR works to create intermediate products which are subsequently made into red or blue pigments, but rose DFR does not appear optimal for production of blue pigments. Gene silencing of blue pigment, replaced it to produce a blue rose.

Gene replacement is considered a rare event in plants, with researchers only able to either add genes as in the case of insect-resistant cotton, or knock out the activity of an existing gene such as in the development of canola from rapeseed. To be able to turn that around is significant in plant biotechnology, providing researchers with a reliable mechanism to explore improvements in economically significant plants that may have otherwise taken years. Gene replacement in plants is such a rare event that till date it was considered almost impossible to achieve.

Though Florigene has already successfully created blue carnations using gene technology and these have been available in Australia since 1996, it will be at least three years before blue roses will be commercially available in Australia, pending approval from the Office of the Gene Technology Regulator for their commercial release.