

## Development of Transgenic Oilseed Rape Accumulating Conjugated Fatty Acid

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### < Summary >

Oilseed rape is an important oilseed crop and has been cultivated in all over the world. About 20 years ago, the first transgenic oilseed rape was developed. At present, transgenic oilseed rape in which herbicide resistant gene was introduced have been cultivated in Canada, and the cultivated area of the transgenic oilseed rape is reached over 80% of total cultivated area of the rapeseed. In laboratory, a number of transgenic oilseed rapes have been developed to improve mainly oil content or fatty acid compositions.

We have tried to develop transgenic oilseed rape that can accumulate unusual fatty acid, punicic acid in the seed and to study physiological effects of the oil on fatty acid metabolisms. We isolated genes related to biosynthesis of punicic acid from pomegranate and *Trichosanthes kirilowii*, and the genes were introduced in oilseed rape with some modification to express the genes seed specifically. Punicic acid was accumulated in the transgenic oilseed rape a maximum at 3.8% of the total fatty acid. Using the rapeseed oil containing punicic acid, the effects of feeding the oil in mice were studied. The dietary transgenic rapeseed oil reduced body fat mass in mice and was more effective than an equal amount of punicic acid from pomegranate oil.

Though punicic acid is only found in limited species such as pomegranate or *Trichosanthes kirilowii*, we can successfully accumulate punicic acid in cultivated oilseed rape and confirm the physiological activities. In the future, oilseed rape that accumulates high concentration of unusual fatty acids that beneficial for industrial or pharmaceutical use will be able to develop.