New non-GM technology platform for genetic improvement of sunflower oilseed crop

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Scientists have developed techniques for the genetic improvement of sunflowers using a non-GMO based approach. The new technology platform can harness the plant's own genes to improve characteristics of sunflower, develop genetic traits, which will improve its role as an important oilseed crop. The work was led by Dr Manash Chatterjee, an Adjunct Faculty member of Botany and Plant Science at NUI Galway, and has been published in the journal *BMC Plant Biology*.

Among oilseed crops, sunflowers are one of the most important sources of edible vegetable oil for human consumption worldwide. Sunflower and other oilseed crops are the source of the vast majority of vegetable oil used for cooking and food processing. The oils are also for industrial processes such as making soaps, cosmetics, perfumes, paints and biofuels.

Dr Chatterjee is currently a Science Foundation Ireland (SFI) ETS Walton Fellow at NUI Galway, collaborating with the SFI Genetics and Biotechnology Lab of Professor Charles Spillane. Dr Chatterjee's research uses an approach called TILLING (Targeting Induced Lesions In The Genome), an established non-GM method for creating and discovering new traits in plants.

According to Dr Chatterjee: "Over the centuries, the sunflower has been cultivated for traits such as yield. However, along the way many useful genetic variations have been lost. This new technology allows us to pinpoint key genetic information relating to various useful traits in the

sunflower, including wild sunflower species. It gives us a method to quickly create variability for further breeding to enhance the quantity, quality and natural performance of the crop. In this era of increasing global food crisis and changing climatic regimes, such ability is highly desirable."

The research breakthrough was part of a collaborative project between Bench Bio (India), URGV Lab INRA (France), NUI Galway Plant and AgriBiosciences Research Centre (Ireland) and Advanta Seeds Argentina. NUI Galway PhD student Anish PK Kumar has been working on the technology platform development as a component of his PhD research studies.

Dr Chatterjee is also involved in research in the NUI Galway Plant and AgriBiosciences Research Centre (PABC) to improve the bioenergy crop Miscanthus. Also known as elephant grass, miscanthus is one of a new generation of renewable energy crops that can be converted into renewable energy by being burned in biomass power stations.

Provided by National University of Ireland, Galway

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