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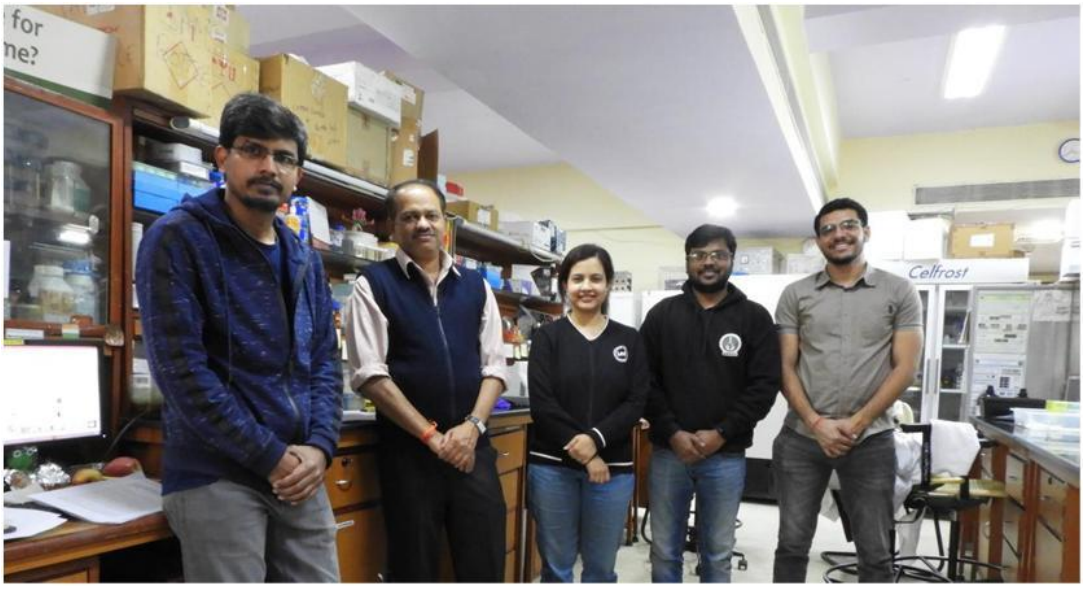
# NIPGR scientist discovered a novel protein repairing enzyme PIMT that can be used to develop climate resilient crops

By Dr. Bilqeesa Bhat

In order to tackle the threatening climate change, scientists at National Institute of Plant Genome Research (NIPGR), New Delhi has discovered a potential candidate gene(s) which can be utilized to develop climate resilient crops with high productivity and yield under environmental stress conditions.




Research team from the Department of Biotechnology's institute, NIPGR, New Delhi

Research team headed by Dr. Manoj Majee reported a novel role of a protein repairing enzyme called as protein L-isoaspartyl methyltransferase (PIMT) which plays a vital role in maintaining plant growth, survival and yield under adverse environmental conditions.

Study demonstrated that stressful environments accelerate the formation of harmful modified amino acid called isoaspartic acid (isoAsp) residues from normal aspartate and aspargine in protein. This harmful amino acid modification badly affects the function of proteins and eventually leads to decreased plant growth, survivability and yield under heat and oxidative

stress. This study is the first to report the significant role of PIMT to plant under during stress conditions.

Dr. Majee team showed that PIMT enzyme restores the deleterious modification in normal amino acids and restored the inherent function of the protein. Furthermore, it was discovered that PIMT-mediated protein repair system is critical in maintaining reactive oxygen species (ROS) homeostasis during stress by protecting antioxidant enzyme functions. ROS are chemically reactive chemical species containing oxygen which cause huge damage to cell structures during environmental stress.

The increasing threat of climate change, global warming has already leashed a substantial negative impact on agricultural productivity and crop yield, causing a huge risk of future food securities. Therefore, development of climate resilient crops variety of major food crops is an urgent call to the scientists working in this domain.

To survive under adverse environmental conditions, plant must have ability to maintain the structural and functional integrity of its cell proteins which are susceptible to both reversible and irreversible damages. Such damage exposes plant to negative effects of environmental stress. Previous studies by the team have also shown that PIMT significantly improves seed vigor and longevity. Therefore, it is highly exciting and promising that a single protein repairing enzyme PIMT can be utilized to develop potential climate resilient crop plants with improved abiotic stress tolerance, yields, seed vigor- and longevity. Thu, the research finding would be of huge importance to agricultural scientists.

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