

WELCOME TO OUR NEWSLETTER

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IN THIS NEWSLETTER YOU WILL FIND:

MESSAGES OF DIRECTOR AND COORDINATOR
AGRI-BIOTECH NEWS
HEALTH-BIOTECH NEWS
OTHER THAN CROP BIOTECH NEWS

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MESSAGE OF DIRECTOR AND COORDINATOR:

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The Pakistan Biotechnology Information Center (PABIC), located at the Latif Ebrahim Jamal National Science Information Center, is the first national non-profit organization established under the patronage of International Service for Acquisition of Agri-Biotech Applications (ISAAA) and National Commission on Biotechnology in 2004. The initiative of the establishment of Pakistan Biotechnology Information Center is an attempt to promote the multidisciplinary research and enhance the awareness and appreciation of biotechnology at the local and national levels.

The PABIC also work to design educational approaches to train interdisciplinary scientists in emerging area of health, agriculture, bioinformatics and environmental biotechnology. The PABIC and ISAAA are working with the aim to enhance the global distribution of information about the biotechnology

I hope the newsletter in hand will contribute to disseminate information about new developments and novel applications of biotechnological approaches in various exciting fields of sciences and technology

Prof. Dr. Sammer Yousuf
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The Newsletter in hand is an attempt to aware the scientific community about the most recent advancements in various the field of biological sciences.

We at the platform of PABIC hope that this newsletter would contribute in enhancing the concept, knowledge and understanding of modern techniques in various fields of biological sciences, among the young researchers of Pakistan, and will inspire their carriers in the fields.

AGRI BIOTECH NEWS:

RESEARCHERS DEVELOP COATED MICROBES TO REDUCE THE USE OF CHEMICAL FERTILIZERS:

Chemical Engineers from Massachusetts Institute of Technology (MIT) have developed microbes coated with a metal-phenol network (MPN) that contains a combination of manganese and a polyphenol called epigallocatechin gallate (EGCG) to improve seed germination and shelf life during transportation

Long-term use of chemical fertilizers will not just contribute to carbon emissions but also contribute to the depletion of soil nutrients. To address this, farmers use microbial fertilizers to minimize the use of chemical fertilizers. However, this method is expensive for many farmers, and the transportation of materials is not viable due to its limited shelf life and susceptibility to heat damage.

Thus, MIT researchers have developed 12 metal-phenol networks (MPNs) containing *Pseudomonas chlororaphis*, a nitrogen-fixing bacterium that controls and protects crops from harmful fungi and pests. The study results show that these coatings kept the microbes alive during the freeze-drying process and improved the seed germination rate by 150%.

For more information, read the article from the Massachusetts Institute of Technology.

RESEARCHERS TAKE A STEP CLOSER TO RELEASING THE FIRST GENETICALLY EDITED POTATO IN LATIN AMERICA:

According to the Agricultural Plant Biotechnology Association - Agro-Bio, Latin America is close to releasing the first gene-edited potato in the region. According to Dr. Gabriela Massa, a researcher at the Agrobiotechnology Laboratory of the Balcarce Agricultural Experimental Station (INTA) and the National Council for Scientific and Technical Research - CONICET, the gene-edited potato “will be registered as a new variety, and from then on, it will be available to whoever wants to license it.”

Potato is the world's third most important crop for human consumption. It is widely cultivated in Latin American countries, and it is part of the daily diet of millions of people in the region. The gene-edited potato is developed by turning off the gene that causes the darkening of the potato through the CRISPR-Cas9 gene editing technique. The darkening or browning of the potato is caused by an enzyme called polyphenol oxidase (PPO). The poor appearance of potatoes during the harvesting and transportation process contributes to the losses of farmers due to poor-quality products.

In a research developed by the INTA, results show that the gene-edited potato can stay fresh for up to 48 hours exposed to air without darkening. This promising result will help farmers reduce the losses brought about by food waste due to the potato's poor appearance.

For more information, read the article from the Agricultural Plant Biotechnology Association - Agro-Bio.

HEALTH BIOTECH NEWS:

NOVEL AI METHOD PRODUCES ANTIMICROBIAL PEPTIDES:

Researchers from Germany produced a novel method to find and create peptides that can be used against different types of bacteria. Their findings demonstrate the great potential of the technique in the health industry.

Antimicrobial resistance is one of the top 10 health threats in the world, causing over 1 million deaths annually. To add to this troubling issue, the production of new microbials is also lagging behind.

Researchers from various institutions in Germany combined AI with synthetic biology to develop a cell-free protein synthesis pipeline that can be used to create antimicrobial peptides from DNA templates. The technique offers a quick, inexpensive, and high-throughput way for antimicrobial peptide screening.

Read the journal article in Nature Communications for more information.

OTHER THAN CROP BIOTECH NEWS:

EXPERTS DISCUSS ROLE OF GENE DRIVES IN ADDRESSING HEALTH AND BIODIVERSITY CHALLENGES:

Stakeholder and regulator engagement is vital for gene drive research to be successful and helpful to biodiversity conservation, according to Prof. Paul Thomas, Genome Editing Program Director at The University of Adelaide. He mentioned this during the webinar titled Genetic Tools For Conservation and Health: What's The Role of Gene Drives? held on November 16, 2023.

The webinar, organized by the Outreach Network for Gene Drive Research, ISAAA Inc., and the Malaysian Biotechnology Information Centre (MABIC), tackled the fundamentals of gene drive and its significance for global health and conservation, presenting some of its prevailing applications under consideration.

Dr. Nina Gloriani, Clinical Microbiology Consultant at St. Luke's Medical Center in Manila, discussed the major health challenges in the Philippines and the potential impact of gene drive in addressing them. Dr. Carmelita Villamor, former Chief Science Research Specialist at the Ecosystems Research and Development Bureau (ERDB), presented the invasive alien species in the Philippines and the challenges in controlling their populations. Dr. Brian Tarimo, Senior Research Specialist at Ifakara Health Institute in Tanzania, defined gene drive and the current applications of the technology in vector control. Prof. Thomas tackled the role of gene drives in suppressing invasive species such as rodents. After the presentations, questions from the participants were addressed by the experts.

A total of 834 participants joined the webinar via Zoom, Facebook, and YouTube. Dr. Mahaletchumy Arujanan, Global Coordinator of ISAAA-BioTrust and Executive Director of MABIC, moderated the discussions.

Visit ISAAA Webinars to watch the webinar on demand.