



PAKISTAN BIOTECHNOLOGY INFORMATION CENTER

ARISEN AUGUST-SEPTEMBER 2025



ISAAA
International Service
for the Acquisition of
Agri-biotech
Applications

In this newsletter you will find:

- Messages of Patron and Coordinator
- Agri-Biotech News
- Other than Crop Biotech News



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MESSAGE OF THE Patron:

**Prof. Dr. M. Iqbal Choudhary, Mustafa (PBUH) Prize Laureate, H.I., S.I., T.I.
Patron PABIC
Coordinator General OIC-COMSTECH
Advisor and Distinguished National Professor
International Center for Chemical and Biological Sciences,
University of Karachi, Karachi-75270, Pakistan.**



The application of modern agriculture biotechnology requires the availability of efficient and compatible communications networks for key players. At any rate, no matter how advancements are planned, Information Networks existing among stake holders can play a key role to shift organizational culture towards collaborative activities within and among institutions in a multidisciplinary, multi-sector and multinational participation.

The Pakistan Biotechnology Information Center (PABIC) is an NGO (Non-Government Organization), generously supported by ISAAA and the Husein Ebrahim Jamal Institute of Chemistry (University of Karachi) is one of the most active organizations working to promote biotechnology and its applications in Pakistan since 2007. Under the patronage of the OIC COMSTECH the main emphasis of PABIC is on the training of media personnel and journalists on objective reporting of the biotechnology and related issues. The PABIC also work to design educational approaches to train interdisciplinary scientists in emerging area of health, agriculture, bioinformatics and environmental 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
Coordinator PABIC (Karachi Chapter)
International Center for Chemical and Biological Sciences,
University of Karachi,
Karachi 75270, Pakistan**



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

Thanks to OIC-COMSTECH the Ministerial Standing Committee on Scientific and Technological Cooperation of the Organization of Islamic Cooperation (COMSTECH) to patronage and support PABIC activities not only at national but international level as well. I 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 and will inspire their carriers in the fields.

Dissemination of Information, Raising Awareness and Capacity Building about the Application of Modern Biotechnology in OIC Member States

Most of the OIC countries, except oil rich Muslim rich nations, rely on their human capital for development. The growing population is leading to a rapid demographic change. According to world population survey, the future growth in human population will take place in India, China, Pakistan, and in many other Muslim countries. This requires a careful planning and efforts to cater the present and future needs of health, environment, agriculture, and industrial applications for the increasing population. This all fall and can be best answer by adopting modern biotechnological tools. Therefore, the biotechnology sector is, and will remain, the most important sector in the economy of most of the Muslim countries. Effective and judicious applications of modern biotechnology can thus play an important role in the sustainable development and economic growth of Muslim countries.

Under the patronage of the OIC-COMSTECH, PABIC has recently initiated an international project entitled, “Dissemination of Information, Raising Awareness and Capacity Building about the Application of Modern Biotechnology in OIC Member States” with the aim to create an effective network to work as a center to aware the people about the recent advancement in the biotech. sector and to teach them that how the adaptation of the modern biotechnology methods can overcome the increasing food and feed demand along with the solution of poverty, especially in OIC-member states. The emphasis will be on conducting workshops and internships to educate young minds and various stakeholders, science communicators, and media personals to develop biotechnology related understanding. PABIC will also work towards activities that will promote the transfer of biotechnology that would be beneficial among the farmers.

AGRI BIOTECH NEWS:

Oxford Develops Honey Bee Food Supplements Using CRISPR-Cas9.

A study led by researchers from the University of Oxford and partners has developed a low-cost, sustainable food supplement that could help reverse the alarming decline in honeybee populations. The supplement, made from edited yeast *Yarrowia lipolytica*, was shown to significantly improve colony reproduction. The findings were published in *Nature*.

The research team used the CRISPR-Cas9 gene editing technique to modify *Yarrowia lipolytica* to produce six key sterols, specific lipids found in pollen. The edited yeast biomass was cultured in bioreactors, harvested, and then dried into a powder to produce the sterol-enriched supplement. “For bees, the difference between the sterol-enriched diet and conventional feeds would be comparable to humans eating balanced meals versus meals missing essential nutrients,” explained Dr. Elynor Moore, lead author of the study.

In controlled trials, colonies fed with the sterol-enriched yeast reared up to 15 times more larvae than those on standard diets, while also sustaining brood production longer. The study also found that the sterol profile of the larvae matched that of naturally foraged colonies. While large-scale field trials are still needed, the researchers believe the product could be available to farmers within two years.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21485>

Original Link: <https://www.ox.ac.uk/news/2025-08-20-saving-bees-superfoods-new-engineered-supplement-found-boost-colony-reproduction>

AI Tool MorphPod Automates Plant Fruit Measuring to Breed Better Crops.

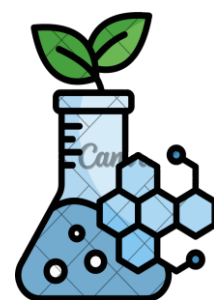
Scientists at Aberystwyth University are developing new artificial intelligence (AI) tools to automate the measurement of plant seeds and pods to breed better crop varieties. Led by researchers from the University's Institute of Biological, Environmental and Rural Sciences and Computer Science, the study demonstrates the power of targeted applications of artificial intelligence to improve the quality of our crops.

The AI-powered tool called MorphPod analyzes images to quickly and accurately measure traits like pod length, width, and volume, which are crucial for crop yield. By linking these physical traits to specific genes, the AI helps researchers identify genetic regions that control plant growth and development. This will allow for more efficient breeding of crops with improved traits such as higher yield, better shape, and increased resilience. The AI tool has been tested on various crops, including oilseed rape, cabbage, and cereals like oats, barley, and wheat.

The MorphPod tool is available online, enabling researchers around the world to replicate or adapt the system for use with other plant species.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21484>

Original Link: <https://www.aber.ac.uk/en/news/archive/2025/08/title-282874-en.html>



AI Uncovers Key to Sustaining Rice Yields for Billions Around the World

A recent study published in *Field Crops Research* shows how machine learning and a five-decade-long rice-cropping experiment are providing crucial insights into food security. An international research team, including scientists from the International Rice Research Institute (IRRI), Gifu University, Kyoto University, Japan's National Agriculture and Food Research Organization (NARO), and the International Fertilizer Association, applied artificial intelligence (AI) to data from 150 consecutive rice crops to understand what drives long-term rice productivity.

The study, which analyzed over five decades of data from 1968 to 2017, is the first to utilize AI to unravel the intricate relationships between climate, crop varieties, and management practices in rice systems. The findings revealed that while improved nitrogen fertilizer use and solar radiation consistently boost yields, their impact varies greatly across seasons. The research highlights the importance of tailored strategies, such as developing new varieties that can withstand specific seasonal challenges, including high nighttime temperatures during the dry season and humid, low-radiation conditions during the wet season. It also found that sticking with the same rice variety for too long can reduce its responsiveness to nitrogen and increase disease risks.

By combining long-term experimental data with modern AI tools, scientists can now develop smarter, season-specific strategies to help farmers maintain rice production. These insights are a blueprint for climate-resilient farming across Asia's 22 million hectares of irrigated rice paddies, which provide food for billions of people.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21496>

Original Link: <https://www.irri.org/news-and-events/news/ai-unlocks-secrets-rice-yield-sustainability-after-50-years-continuous>

Experts Develop Optimized Transformation Systems for Local Rice Varieties

Researchers from Anhui Science and Technology University in China reported the successful development of a transformation system for four japonica rice varieties and editing of rice gene *OsCCD7*. The results are reported in *Agronomy*.

Agrobacterium-mediated transformation is commonly used in developing rice traits. However, with their complex genotypes, it is a challenge to find an effective transformation system for local rice varieties. Thus, the research team selected four rice varieties to test the effects of different culture media on callus induction, browning resistance, contamination resistance, callus tolerance, differentiation, regeneration, and root development. Furthermore, they also selected two varieties for gene editing to improve plant architecture and tiller development using constructive transformation systems.

The tests showed that customized culture media is the key to better transformation. XG293 and WD68 rice varieties garnered the best results with a specific concentration of 2 mg/L of 2,4-D and 1 mg/L of naphthaleneacetic acid (NAA); while indica rice H128 and E33 worked best with 3 mg/L of 2,4-D and 1 mg/L of NAA. Adding maltose and ascorbic acid to the media was observed to stop the severe browning of variety H128, and timentin was effective in controlling contamination after the *Agrobacterium* infection. High transformation rates for all four varieties were recorded after adjusting the infection time. XG293 and WD68 had high transformation efficiencies of 43% and 52%, respectively, with a 10-minute infection time; while H128 and E33 performed better with a shorter, 5-minute infection time, reaching transformation efficiencies of 40%.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21501>

Original Link: <https://www.mdpi.com/2073-4395/15/8/2008>



Australian Grain Technologies Releases World's First Dual Herbicide Tolerant Barley

Australian Grain Technologies (AGT) has released the world's first dual herbicide tolerant barley variety, a breakthrough in crop breeding. The new variety, named AGT-Bunyip IA, combines both ImiTol™ and CoAxiom® technologies, making it tolerant to imidazolinone herbicides and Aggressor® herbicide.

The dual tolerance system offers growers a new level of control and peace of mind. They can confidently sow AGT-Bunyip IA after a Clearfield® or imidazolinone-tolerant crop, mitigating the risk of residual herbicide damage. Additionally, they can use Aggressor® herbicide during the growing season for robust weed and volunteer cereal control. This "stacked" tolerance package is a result of AGT's commitment to creating varieties that are both productive and practical for farm management.

AGT-Bunyip IA is also a high-performing variety. Trials have shown that it consistently outperforms the most widely grown variety, and it is highly adaptable to various environments across Australia. The plant type is compact, offering improved standability compared to other varieties.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21493>

Original Link: <https://www.agtbreeding.com.au/news/world-first-barley-variety-offers-dual-herbicide-tolerance>

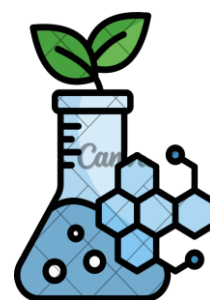
APHIS Deregulates Bioengineered Blue-Purple Moth Orchid

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has determined that *Phalaenopsis* orchid (ISK-311NR-4), developed by Ishihara Sangyo Kaisha, Limited, using genetic engineering to have modified flower color. According to APHIS, it is unlikely that the bioengineered blue-purple moth orchid will pose a greater risk as a plant pest than the unmodified comparator. Thus, the orchid is no longer subject to their regulation for products of genetic engineering.

APHIS listed the basis of their decision, including information and data submitted by the developers as requirements for the petition to deregulate, existing scientific data, and public comments on the Federal Register notice regarding the petition and plant pest risk assessment.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21504>

Original Link: <https://www.aphis.usda.gov/news/program-update/usda-announces-deregulation-orchid-developed-using-genetic-engineering#:~:text=WASHINGTON%2C%20September%203%2C%202025%E2%80%94to%20produce%20blue%2Dpurple%20flowers>



OTHER THEN CROP BIOTECH NEWS:

Study Reveals Liberica Coffee Consists of Three Distinct Species with Climate-Resilient Options.

The global coffee supply relies on just two species, Arabica (*Coffea arabica*) and Robusta (*C. canephora*). Climate change, rising temperatures, and unpredictable weather patterns are making it increasingly difficult for farmers to grow these coffee plants, posing a significant threat to the industry.

As climate change threatens the two main coffee species, Arabica and Robusta, researchers are looking for alternatives. A new genetic study on Liberica coffee (*C. liberica*) published in *Nature Plants* has revealed it is not one but three distinct species, each with unique traits that could make them more resilient to warm temperatures, drought, and erratic weather. While Liberica is already grown in countries like Uganda, South Sudan, India, Vietnam, Malaysia, the Philippines, Indonesia, and the Pacific, accounting for less than 1% of global production.

The new study reveals that the three species—*C. liberica*, *C. dewevrei*, and the lesser-known *C. klainei*—have unique climate tolerances. *C. dewevrei* is more drought-tolerant, while *C. liberica* is better suited for regions with seasonal rainfall and longer dry seasons. These species, particularly *C. liberica* and *C. dewevrei*, have significant potential for cultivation in hotter, wetter climates where Arabica and Robusta struggle. Further research and field trials are needed to confirm these adaptations, but the findings offer promising new avenues for coffee breeding to secure future global coffee supplies.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21483>

Original Link: <https://www.gcrmag.com/new-coffee-species-to-stand-up-against-climate-impact/>

Gene-Edited Cane Toads Shed Light on Albinism

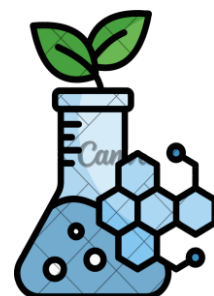
Experts from Macquarie University used CRISPR gene editing technology to uncover why albino animals are so rare in nature. The study, published in the *Proceedings of the Royal Society B*, used gene-edited albino cane toads to test long-standing theories about the evolutionary challenges of albinism.

The study found that albino toads struggled to compete even in controlled environments without predators. Albino tadpoles were less likely to survive and matured faster when living alongside pigmented siblings. As adults, they grew more slowly and had trouble catching prey. Further experiments showed that albino toads needed brighter light to hunt and frequently missed prey, making survival difficult in their natural nocturnal habitats.

The study highlights the power of gene editing to answer evolutionary questions that have long been difficult to test. “By knocking out just one gene, we can directly compare siblings from the same parents, with pigmentation as the only difference,” explained Professor Rick Shine. The team says the findings not only challenge assumptions about albinism but also demonstrate how CRISPR can be used to explore other evolutionary puzzles and potentially inform invasive species control.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21497>

Original Link: <https://lighthouse.mq.edu.au/article/august-2025/albino-toads>



Sunlight-Recharged Glow-in-the-dark Succulents New Way to Plant-based Lighting Systems

In a new study published in the journal *Matter*, researchers in China have developed a novel way to create glow-in-the-dark plants. Unlike previous methods that relied on genetic engineering, the research team injected succulents with special phosphor particles similar to those used in glow-in-the-dark toys. These materials absorb and store light, then re-emit it as a soft, continuous glow for up to two hours.

The team, led by materials scientist Xuejie Zhang from the South China Agricultural University in Guangzhou, found that succulents with their fleshy, dense leaves were ideal for this process, resulting in a strong and uniform glow. They used the succulent *Echevaria* 'Mebina', a common houseplant that grows rosettes of dense and fleshy leaves. The technology is also versatile, allowing for a wide range of colors, including blue-green, red, and white.

While the current method requires injecting each leaf, the researchers hope to use smaller particles in the future to simplify the process. They have applied for a patent and envision the technology being used for decorative lighting installations. While questions remain about the long-term health effects on the plants and the potential toxicity if ingested, the researchers see this as a promising and innovative way to bring light into living spaces.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21495>

Original Link: <https://www.scientificamerican.com/article/glow-in-the-dark-succulents-created-by-scientists-shine-in-multiple-colors/>

Brookhaven National Laboratory Research Team Identifies Key Protein for Larger, Tougher Crops for Fuel, Bioproducts

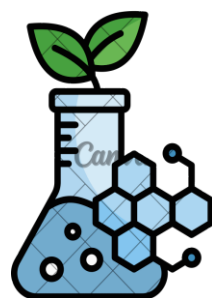
Biologists at Brookhaven National Laboratory have identified a plant protein that plays a crucial role in three key biological processes in poplar plants: iron deficiency responses, cell wall biosynthesis, and the creation of disease-fighting molecules. The research team published their study in *The Plant Biotechnology Journal*.

The researchers found that the gene *PttrbHLH011* regulates these processes in poplar plants. By "knocking out" this gene, they were able to engineer plants that grew taller, had increased iron content, and produced more energy, which in turn supported the synthesis of valuable bioproducts, such as lignin and flavonoids. The discovery holds significant promise for developing more resilient and productive bioenergy crops. The increased iron content in the engineered plants enhanced photosynthesis, enabling them to produce more energy to support growth. The surge in flavonoid synthesis is particularly important for bio-preparedness efforts, as these molecules help protect plants from disease. This new understanding of how plant genes and proteins work could lead to the creation of crops that can thrive even on iron-deficient, marginal land.

Traditionally, researchers have focused on increasing the sugar content in plant cell walls for biofuels. However, this study also highlights the potential of lignin, a rigid cell wall component, which can be used to produce industrial bioproducts such as cement and adhesives. The researchers are now working to fine-tune the expression of specific target genes to further leverage the findings from this study, with the ultimate goal of strengthening crops' resistance to pathogens and increasing biomass yield.

ISAAA Link: <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21502>

Original Link: <https://www.bnl.gov/newsroom/news.php?a=122553>



UPCOMING BIOTECH. AND RELEVANT EVENTS

COMSTECH-PCMD Training Course in Virology and Pandemic Preparedness

October 15 to November 30, 2025

OIC – COMSTECH, in collaboration with the Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD), University of Karachi, is pleased to announce the COMSTECH – PCMD Training Course in Virology and Pandemic Preparedness.

This intensive six-week program is designed to provide hands-on training and practical knowledge in the following critical areas:

- Epidemiology of viral diseases
- Biorisk assessment: identification of possible sources of viruses and prevention of new zoonotic diseases
- Development of diagnostics and therapeutics against viral outbreaks
- Dealing with viral infections: real-time data collection and preparation for future outbreaks



Apply Now

COMSTECH-PCMD Training Course in Virology and Pandemic Preparedness

Objective of this training is to give hands on knowledge and practice in the following fields:

- Epidemiology of viral diseases
- Biorisks assessment: identification of possible sources of viruses and prevention of new zoonotic diseases
- Development of diagnostics and therapeutics against viral outbreaks
- Dealing with viral infections: real time data collection of the spread and preparation for future outbreaks

FUNDING

**Lab access and Mentorship**
PCMD being a host institution will provide supervised free of cost lab access and mentorship

**Accommodation and Meals**
PCMD will also provide accommodation and meals to the selected participants

**International Travel Cost**
OIC - COMSTECH will fund international air travel of selected participants.

ELIGIBILITY

Eligible Countries: All OIC member states.
Minimum qualification held: M.S./Ph.D. in Biomedical/Health Sciences
Duration: 6 Weeks
Field: Virology/Molecular Biology/ Infectious Diseases
Age limit: Maximum 35 years (For graduate studies)
45 years (For post-graduate studies).

Application Form Link <https://www.jotform.com/form/252512029987463>
<https://comstech.org/comstech-fellowship/>

Apply by 18th September 2025

<https://comstech.org/>  (+92 51) 9220681-3

Further information kindly visit:

<https://comstech.org/comstech-pcmd-training-course/>

UPCOMING BIOTECH. AND RELEVANT EVENTS

9th International Symposium-Cum-Training Course on Molecular Medicine and Drug Research (MMDR-9)

November 24 - 27, 2025

Organized by

Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD)
International Center for Chemical and Biological Sciences, University of Karachi.

Molecular medicine is an emerging field that deals with the advances in molecular and cellular biology to characterize how a normal cellular process fails or succeeds in subverting a disease. In recent years, there has been enormous growth in the understanding of biological processes. Molecular biology methods can be used to discover the mechanism of pathological processes, leading to the development of new therapeutic concepts based on the understanding of molecular medicine.

The following aspects of molecular medicine and drug discovery will be covered in this symposium:

- Bioinformatics and Computational Biology.
- Cell and Molecular Biology
- Diabetes and Metabolic Disorders
- Genes and Genomics
- Infectious Diseases
- Medicinal Chemistry
- Molecular Immunology
- Molecular Oncology
- Molecular Pharmacology
- Neurosciences
- Proteins and Proteomics
- Stem Cell Therapy and Tissue Engineering
- Structural Biology
- Clinical Trials, Translational Biomedical Research and bioequivalence studies

Further information kindly visit:

<https://www.iccs.edu/conference>



UPCOMING BIOTECH. AND RELEVANT EVENTS

International Conference and Training Workshop on “Food Systems Transformation for Climate Actions” (ICTW-FSTCA 2025)

Organized by
OIC – COMSTECHE, and ICESCO,
In collaboration with Makerere University, Uganda
Date: 13 – 15 October, 2025

Food systems contribute one-third of the global anthropogenic greenhouse gas emissions. Hence, limiting global warming well below 2 degrees would be hard without mitigating emissions from food systems. Furthermore, climate change negatively impacts food systems, jeopardizing food security. Ongoing and projected climate change and extreme weather events could result in food insecurity and malnutrition of millions of people, with cascading effects beyond food systems. Thus, it is crucial to explore climate actions leading to sustainable food systems and transform food systems to net zero greenhouse gas emissions

Multiple response options exist throughout food systems to mitigate climate change and build climate resilience. These options include institutional management and governance actions that could prevent or reduce the severe climate risks to future human food security and nutrition. Moreover, the food system approach could bring down adaptation and mitigation silos with novel ways to integrate climate change solutions from production to consumption. Thus, this workshop aims to provide a platform for exchanging options for food systems transformation for climate action among various stakeholders. The workshop focuses on Africa, the world region suffering from several issues related to food and nutrition security.



Further information kindly visit:

<https://comstech.org/international-conference-and-training-workshop-on-food-systems/>

UPCOMING BIOTECH. AND RELEVANT EVENTS

- **Advancements in antimalarial drug discovery and development (Webinar)**

September 18, 2025, 11:00 AM –12:00 PM CEST

(https://www.labiotech.eu/advancementsresource-antimalarial-drug-discovery-development/?utm_campaign=events_page_antimalarial_webinar&utm_medium=referral&utm_source=labiotech.eu)

- **Accelerating Tomorrow's Antibody Therapeutics Today (The Summit of Antibody Science and Your Path to Commercial Success).**

December 14 - 17, 2025, Marriott Marquis San Diego, USA

(https://informaconnect.com/antibody-engineering-therapeutics/?vip_code=LABIOTECH10&utm_source=event%20listing&utm_medium=labiotech&utm_campaign=featured%20event&utm_content=listing)

- **16th World ADC San Diego Summit.** (The World's Largest & Definitive Antibody-Drug Conjugate Event)

November 3-6, 2025 | San Diego, USA

(<https://worldadc-usa.com/>)

- **BIO EUROPE 2025**

Meet Myllia Biotechnology at BIO EUROPE 2025 from November 3-5, 2025 in Vienna, Austria

(<https://myllia.com/events/bio-europe-2025/>)

- **BIO Patient Advocacy Changemakers Event**

October 27-28, 2025, Washington, DC

(<https://pace.bio.org/>)

- **Biotech Adventure: Genes At Work In The Laboratory Bioforfun, 2nd Edition**

04/10/2025-05/10/2025, Italy.

(<https://biotechweek.org/event/biotech-adventure-genes-at-work-in-the-laboratory-bioforfun-2nd-edition/>)

- **Biotech in Europe: act for global impact**

01/10/2025, Italy

(<https://biotechweek.org/event/biotech-in-europe-act-for-global-impact/>)

- **Biomarkers & Precision Medicine UK**

Organized by Oxford Global, this event marks its 20th year as a premier gathering for professionals in biomarker research and precision medicine.

30 September 2025-1 October 2025, London, UK

(<https://www.thepharmaletter.com/biomarkers-and-precision-medicine-uk>)

