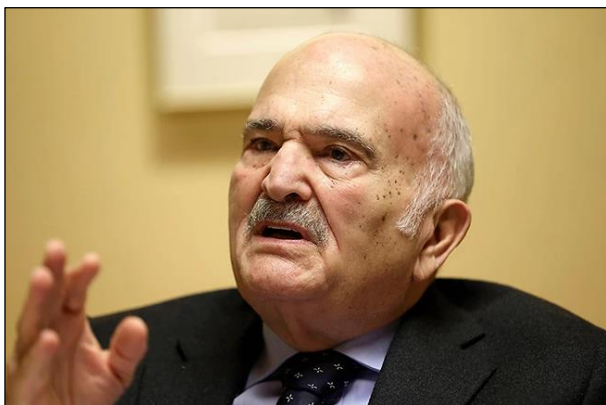




## MESSAGE FROM HIS ROYAL HIGHNESS PRINCE EL HASSAN BIN TALAL FOUNDING PATRON OF THE ISLAMIC WORLD ACADEMY OF SCIENCES (IAS)

DELIVERED DURING THE 4<sup>TH</sup> CONFERENCE OF THE  
ISLAMIC WORLD ACADEMY OF SCIENCES (IAS)\*



Islamic countries have been facing tremendous internal and external challenges on the social and economic development scenes for the last four to five decades.

Although considerable achievements have been made in some areas in the past, the future challenges are even greater. Islamic countries are rich in natural and human resources, yet they are still relatively poor; their natural resources are fast depleting; their indigenous science and technology capacity is underdeveloped; and their economic and technological dependence is increasing.

I believe that these challenges and difficulties can be faced and overcome when we examine our past experience and begin to utilize our inherent strength which stems from our Islamic culture.

Islamic culture is the culture of faith, science, innovation, harmony between man and nature, and cooperation among Muslims. When these aspects were fully understood and applied, the Muslim *Ummah* mastered the world's scientific and technological knowledge and achieved self-reliance for six consecutive centuries. We should thus emphasize these fundamental aspects in our educational systems, promote an on-going dialogue between Muslim scientists, entrepreneurs, and the *Ulama* of Islam and employ all forms of public media to revive our science culture, coupled with faith and the will to succeed in all our endeavours in life.

Although moderate achievements in science and technology have been made by Islamic countries since the United Nations Vienna Conference, the economic and technological gap between our countries and the developed countries is still rapidly widening. One of the major reasons for this gap is that we perhaps put more emphasis on apparent technology transfer and on material inputs for economic growth, than on real technology transfer and qualitative inputs of indigenous science and technology components, such as research and development, effective management, and organization.

\*The IAS 4<sup>th</sup> Conference under the theme 'Technology Transfer for Development in the Muslim World', was held in Antalya, Turkey.

Hence, our socio-economic planning should be more in favour of scientific and technological inputs than on material inputs. In other words, we should adopt new planning trends founded on technology-based development to achieve accelerated technical progress and economic growth. This type of development requires a strong indigenous capacity in research and development and in other technology components.

It goes without saying that technology has positive and negative influences on the environment. We all know that major environmental threats are associated with technology development and that such threats transcend political boundaries. Technology's negative influences on the environment require that environmental considerations be among the priority issues in the process of technology assessment. This should be followed up by formulating and implementing national strategies and policies for the protection of people, land, water, and air. Protection of the environment is not only a good economic investment in the short run, but also of prime importance to the moral legacy of our Islamic tradition, and to the quality of life which our future generations will inherit.

The building of a strong indigenous capacity in research and development requires cooperation between Islamic countries. I believe that the science and technology cooperation plan, approved by the OIC summit in Rabat in 1984, is of paramount importance and that it should be activated and supported. Short of this, individual Islamic countries would not be in a position to develop or generate new technologies needed to increase their collective self-reliance.

It has become evident that while one concentrates on and prepares the ingredients for technological, economic and social development, one can no longer draw a clear

line between political concerns and the prospects for future generations around the world. Examples of this are nowhere more evident than in the current confrontation in the Middle East, which holds the seeds of a potential global disaster. This confrontation would not only endanger the lives of people in the area but would also result in tremendous environmental catastrophe: the like of which has not been experienced by the human race since the Chernobyl incident. This would jeopardise the efforts and endeavours our Islamic countries have exerted over the last three decades to develop their indigenous technological and economic capabilities.

Thus, while we pursue our actions and policies, which will determine the lives of future generations, we are required to give our utmost attention and efforts to overcome the causes of this conflict in order to rescue the world from this potential disaster.

Real technology transfer cannot occur in Islamic countries without a technology-based development planning that aims at increasing the demand for the national research and development system and other technology components, and makes available the necessary resources to provide the supply required. Real technology transfer also implies mastering the imported core technologies, introducing needed adaptations, and improving products and processes. Such a technological development is indeed difficult to accomplish without cooperation between Islamic countries.

Furthermore, the real technology transfer should form the basis for the indigenous generation of new technologies, which would enable Islamic countries to export new technologies instead of exporting raw materials and primary commodities.

## UNESCO: SHARING CULTURAL HUMANITY FOR THE SAKE OF BUILDING COMMON VALUES FOR A BETTER FUTURE<sup>⊗</sup>

**ADNAN BADRAN FIAS, FAAS**

*President, Islamic World Academy of Sciences  
and President, Arab Academy of Sciences*



In 1945, in the aftermath of a devastating world war, nations founded UNESCO on a profound insight: peace must be constructed in the minds of men and women. They understood that political treaties alone are fragile unless anchored in shared understanding, education, culture and common values system.

Culture shapes identity, memory, ethics, and belonging. When cultures are respected, societies flourish. When they are denied or manipulated, division deepens. To share cultural humanity is not to erase difference but to recognize diversity as a source of strength.

UNESCO's cultural mission, which is to protect world heritage, safeguard intangible traditions, and promote intercultural dialogue, reminds us that humanity's achievements belong to all people on our planet. The monuments of Asia, the manuscripts of the Middle East, the art of Europe, the wisdom traditions of Africa and the Americas, each form part of a shared human story.

Misinformation and identity-based conflicts threaten social cohesion. Cultural heritage is sometimes targeted in conflicts as a symbol of erasure. Inequality widens not only in income, but in access to knowledge and cultural participation.

To build common values, we must act in three essential ways: **First**, through education, by cultivating global citizenship, critical thinking, and respect for diversity in the next generation.

**Second**, through ethical innovation, by ensuring that technology strengthens cultural exchange rather than deepens division. **Third**, through dialogue, by creating spaces where civilizations meet not in confrontation, but in conversation.

Common values are not imposed; they are cultivated. They emerge from dialogue, mutual respect, and shared responsibility. They include human dignity, equality, freedom of expression, cultural diversity, and sustainable development.

The architecture of a better future cannot be built solely with economic blueprints, it requires moral foundations that is provided by cultural humanity.

In a world searching for direction, UNESCO's mission remains a compass, reminding us that humanity's greatest achievements are born not from domination, but from cooperation.

Let us, therefore, renew our commitment to cultural solidarity and let us ensure that the new world we are shaping is guided not only by power and technology, but by wisdom, compassion, and respect for our common humanity.

There is no doubt that we are living in a fast-changing world, particularly with the advancement of science and technology embedded by Artificial Intelligence (AI), which will shape our future generations to a better world or a worse world. This is why the UNESCO mission is so crucial at this time to spread the culture of peace in the minds of men and women through its international mandate of education, science, culture and communication.

We, the people of all nations, shall resolve conflicts and wars by dialogue and wisdom and never yield to permit diversity and differences to lead to conflicts, but to lead to a harmonious, free mosaic world.

<sup>⊗</sup> Paper sent to the World Public Summit India that was held during 24-26 March 2026, in New Delhi, India.

## NEW DELHI HOSTED THE INTERNATIONAL CONFERENCE "UNESCO: UNITING HUMANITY FOR SHARED VALUES AND A BETTER FUTURE"\*

The International Conference "UNESCO: Uniting Humanity for Shared Values and a Better Future" was held on 24 March 2026 in New Delhi. The event held as part of the World Public Summit: India "New World: India in the Architecture of a Shared Future", was co-hosted by the World Peoples Assembly, the University of Delhi and the UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development.

The discussion was moderated by Professor **Girish Munjal** of the University of Delhi. Welcoming the participants, he emphasized that in an era of rapid change and complex challenges, the need for dialogue, mutual respect and shared goals is at its highest. He also noted that the World Peoples Assembly builds its activities in accordance with the fundamental UNESCO principles, implementing a model of multi-level social partnership of peoples based on spiritual and moral principles in the name of peace, harmony, and interethnic good-neighborliness.

The Secretary General of the World Peoples Assembly, **Andrey Belyaninov**, sent a welcoming message to the participants of the international roundtable. He emphasized the importance of consolidating international efforts to promote humanitarian values and noted the symbolism of holding the event in India, a country with a rich cultural heritage and long-standing traditions of philosophical thought. Andrey Belyaninov also noted that the delegation of the World Peoples Assembly took an active part in the UNESCO General Conference in Samarkand, which confirms the organization's commitment to global dialogue.

Chairman of the Board of Trustees of the University of Jordan, former Prime Minister of Jordan, and Deputy Director-General of UNESCO in 1990-1998, **Adnan Badran**, in his speech shared his reflections on the transformation of UNESCO, noting the unchanging relevance of its mission and the need to adapt to the new challenges of the modern world. He encouraged participants to build on the institutional experience accumulated so far, but to look boldly into the future, using dialogue as the main tool for building a more just world.

The Director of the UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development, **Obijiofor Aginam**, focused his speech on the central role of education as the basis of peace and sustainable development. He emphasized that the institute he leads follows the philosophy of Mahatma Gandhi, viewing education not just as the transmission of knowledge, but as a tool for transforming individuals and societies in a spirit of non-violence and mutual understanding. The speaker noted that in the context of growing polarization, it is educational programs focused on peace and sustainable development that can shape a new generation of leaders who are ready for dialogue and cooperation.

The representative of the Department of Culture and Dialogue of Civilizations of the Arab League (Egypt) **Noha Sobhi Ayad** emphasized the role of the Arab League as one of the oldest regional associations, which has been a key partner of UNESCO for many years in preserving cultural heritage, supporting multilingualism, and promoting dialogue between civilizations. She focused on the activities of the department she heads, which works at the intersection of tradition and modernity, promoting understanding between cultures both in the Arab region and beyond. The speaker emphasized that the dialogue of civilizations is not just an academic concept today, but a practical tool for building inclusive and harmonious societies.

In his speech, Professor **Pandey Kumar** of the School of International Studies at Jawaharlal Nehru University addressed the issues of international cooperation in the context of current geopolitical changes. He emphasized that UNESCO's values of peace, science, education, and culture remain universal guiding principles that enable countries with diverse political systems to find common ground. The speaker highlighted the role of public diplomacy and academic exchanges as mechanisms for building trust between nations.

In his speech, the founder and Secretary-General of the UN Society at the Pontifical Catholic University of Chile, **Ulloa Savalla**, emphasized the importance of involving young people in international organizations. He noted that student

\* <https://eurasia-assembly.org/en/news/new-delhi-based-international-conference-unesco-uniting-humanity-shared-values-and-better>

initiatives and youth associations can become drivers of change, bringing energy, new ideas, and a fresh perspective to UNESCO's agenda.

**Madhish Parikh**, Coordinator of the Heritage Program, which is part of UNESCO's World Heritage Volunteers program, shared his unique experience in the practical conservation of cultural heritage sites. He provided a detailed account of the program's activities in India, emphasizing the crucial role of volunteer movements in engaging local communities and youth in the preservation of monuments. The speaker emphasized that participation in the World Heritage Volunteers program not only contributes to the preservation of sites, but also fosters a deep understanding of the value of cultural diversity and personal responsibility among participants.

**Abhishek Tandon**, Associate Professor at the Department of Operations Research at the University of Delhi and President of the ABVP Delhi Chapter, addressed the topic of collaboration between educational institutions and the public sector in achieving sustainable development goals. He emphasized that active citizenship is crucial for promoting the values espoused by UNESCO. The speaker also highlighted the importance of an interdisciplinary approach in education, which enables the training of professionals capable of tackling complex challenges.

In her speech, **Alexandra Ochirova**, UNESCO Goodwill Ambassador, provided a detailed overview of the UNESCO Recommendations on the Ethics of Artificial Intelligence, describing it as a historic achievement for the organization. She emphasized that technological progress should not be pursued in isolation from human values; on the contrary, it is the philosophical understanding of the consequences of the introduction of artificial intelligence that allows us to monitor and control progress. She also noted that UNESCO has a unique competence in setting ethical frameworks for the development of new technologies.

The series of presentations was concluded by **Abyrlal Mukherjee**, founder of the Universal Digital Education Initiative and Executive Director of the Vajpayee Research Foundation (India). In his speech, he presented his vision for the transformation of education in the digital age.

*“Ensuring universal access to quality digital education is not only a technological challenge, but also a humanitarian one that is directly related to UNESCO's mission,” he emphasized.*

The speaker shared his experiences with initiatives he has implemented in universal digital education, noting that India, with its multi-million-strong student population, can serve as a model for many developing countries.

In his closing remarks, Girish Munjal highlighted the key messages from the participants' presentations:

- Education remains the basis of peace and sustainable development. The speakers unanimously emphasized the need for digital inclusion and universal access to quality education, as well as the importance of fostering a spirit of peace and non-violence.
- Dialogue between civilizations and cultures is a prerequisite for building inclusive societies. The experience of international organizations demonstrates that mutual respect and the exchange of cultural values contribute to building trust between nations.
- Science and technology should serve humanity based on strong ethical principles. The speech by the UNESCO Goodwill Ambassador Alexandra Ochirova and other participants showed that the development of artificial intelligence and digital technologies requires constant philosophical reflection and ethical regulation.
- The UNESCO communication strategy of plays a crucial role in promoting its mission. The participation of media representatives in the discussion emphasized that high-quality, ethical, and accessible information content is necessary to maintain the relevance of the organization's values in the eyes of the general public.
- The international roundtable in New Delhi became an important platform for a constructive dialogue between representatives of academia, international organizations, civil society institutions, and the media. The participants confirmed that shared values remain the basis that allows humanity to unite in order to solve the most complex challenges of our time, and that UNESCO's mission remains relevant and necessary in a rapidly changing world.

**DELHI DECLARATION**  
**WORLD PUBLIC SUMMIT: INDIA**  
**“A NEW WORLD: INDIA IN THE ARCHITECTURE OF A COMMON FUTURE”**



**THE DELHI VISION OF THE 21st CENTURY**

Humanity is entering a new stage of its development - an era of increasing interconnectedness among nations, rapid technological progress, and expanding cultural dialogue.

The contemporary world reveals the richness of civilizational diversity, which becomes a source of mutual enrichment, cooperation, and sustainable development.

The formation of the architecture of a shared future requires strengthening trust among peoples, promoting a culture of peace, and fostering an open dialogue among civilizations.

The philosophy of the ancient Indian civilization Vasudhaiva Kutumbakam - “The World Is One Family” today acquires new global relevance, inspiring the international community to search for harmonious models of development based on respect for diversity and responsibility for the future of humanity.

The World Public Summit creates a space for global public dialogue that brings together representatives of different countries, cultures, and generations.

The Delhi Summit opens a new stage of this movement - a stage of expanding civilizational dialogue among the regions of the world and shaping the value-based architecture of our shared future.

Human unity unfolds through respect for civilizational diversity, human dignity, and shared responsibility for the future.

**DELHI GUIDELINES FOR A NEW WORLD**

In developing the Delhi Principle, the participants of the World Public Summit affirm the following value guidelines for global development. Conscious Unity of Humanity Humanity develops as an interconnected community of peoples united by shared responsibility for the future of the planet. Respect for Civilizational Diversity The cultural and spiritual diversity of civilizations is a source of mutual enrichment and sustainable development. Human Dignity The human being - together with culture, spiritual values, and creative potential - is the foundation of humanitarian development. Dialogue and Cooperation of Civilizations Open dialogue among cultures and societies strengthens trust between peoples and creates space for joint creation and cooperation.

**DELHI DECLARATION  
WORLD PUBLIC SUMMIT: INDIA  
“A New World: India in the Architecture  
of a Common Future”**

In the name of dialogue among civilizations, trust among peoples and the shared future of humanity

**PREAMBLE**

We, the participants of the World Public Summit: India,

gathered in New Delhi - the capital of one of the world's most ancient civilizations, which for millennia has shaped a philosophy of harmony, spiritual search, and respect for cultural diversity,

recognizing the historic responsibility of the present generation for shaping the architecture of a shared future,

guided by the ideas of conscious unity of humanity, respect for human dignity, equality of peoples, and fair global cooperation,

affirming the continuity of the ideas of the First World Public Assembly “A New World of Conscious Unity,” held in Moscow on 21 September 2025 and bringing together representatives from 153 countries,

noting the contribution of the Republic of India as one of the world's most ancient civilizations and one of the leading centers of contemporary global development, combining rich spiritual heritage with dynamic technological progress,

sharing the philosophy of Vasudhaiva Kutumbakam - "The world is one family", which affirms the interconnectedness of humanity while respecting cultural and civilizational diversity, based on conflict-free coexistence,

express our commitment to promoting a new stage of global cooperation based on balance of interests, respect for differences, dialogue among civilizations, and partnership among peoples for the sake of peace.

**CIVILIZATIONAL FOUNDATION OF A NEW WORLD**

We affirm that the future of humanity rests upon respect for cultural roots, spiritual traditions, and the historical experience of peoples.

The concept of conscious unity implies:  
recognition of the equal value of all civilizations  
respect for the cultural and spiritual heritage of peoples  
development of a culture of peace through dialogue among cultures, religions, and worldviews  
strengthening public diplomacy as a space for interaction among societies  
Human unity unfolds through respect for its diversity.

**II. MULTIPOLARITY AS A PRINCIPLE OF GLOBAL DEVELOPMENT**

Multipolarity reflects the richness of cultural and civilizational diversity and contributes to a more balanced system of international interaction.

We support:  
development of multilateral cooperation  
strengthening integration processes based on equality  
preservation and promotion of intangible cultural heritage  
expansion of humanitarian cooperation among regions of the world

**III. PARTNERSHIP AND CO-CREATION**

We recognize that national interests and common humanitarian goals are interconnected.

We view international cooperation as a space for joint creation.

The architecture of the future is formed on the basis of:

trust and shared responsibility  
respect for cultural identity  
harmonious combination of national interests and common humanitarian goals  
joint search for sustainable development models.

#### **IV. THE FUTURE GENERATION**

The future of the world is determined by the values transmitted to the younger generation.

We attach particular importance to:  
strengthening intergenerational dialogue  
promoting a culture of peace and mutual respect  
developing education that connects tradition and innovation  
supporting youth intercultural leadership.

#### **V. TECHNOLOGY IN THE SERVICE OF HUMANITY**

Technological development opens new opportunities for the progress of humanity.

We support:  
technological development for the benefit of society  
ethical approaches to the use of artificial intelligence  
responsible media in shaping humanitarian narratives  
expanding digital opportunities for education and international cooperation.

#### **VI. THE ECONOMY OF TRUST**

The economy of the future combines efficiency, social responsibility, and the values of trust.

We support: development of an economy of shared value  
expanding economic and social opportunities for all  
development of sustainable growth models based on cooperation.

#### **VII. THE GLOBAL MOVEMENT OF PUBLIC SUMMITS**

The World Public Summits form an international platform for civilizational dialogue.

The Summit in India opens a new phase of global public interaction and becomes the starting point of a series of regional public summits in 2026:

the Arab world, Latin America, Africa

The global dialogue will culminate in the World Public Summit, which will take place in Moscow in September 2026 and will be dedicated to the theme: “A New World: Values that Unite.”

#### **CONCLUSION**

We regard the Delhi Declaration as a contribution of the international community to the formation of a paradigm of conscious unity, where cultural diversity becomes a source of strength and dialogue becomes the foundation of a sustainable and just world order.

Guided by the Delhi Principle, we reaffirm our commitment to developing cooperation in a spirit of partnership, trust, and mutual respect.

Conscious unity of peoples,  
respect for civilizational diversity, and  
cooperation for the future  
form the architecture of a new world.

Formula of Movement  
Conscious Unity  
→ Dialogue of Civilizations  
→ Values that Unite  
→ Architecture of a Shared Future

We confirm our readiness for further cooperation in a spirit of partnership, trust, and constructive interaction.

A new world begins with conscious unity.

*Adopted by the participants of the  
World Public Summit: India  
New Delhi, Republic of India  
25 March 2026*



### ZAKRI ABDEL HAMID FIAS ... AS I HAVE KNOWN HIM

#### ADNAN BADRAN FIAS, FAAS

*President, Islamic World Academy of Sciences  
and President, Arab Academy of Sciences*



Prof. **Zakri Abdul Hamid** is a highly respected Malaysian scientist, academic, and international policy leader whose career spans scientific research, institutional leadership, and global environmental governance. Trained in genetics and agricultural science, he has made significant contributions to crop improvement, biodiversity conservation, and the application of science to sustainable development. He began his academic journey in Malaysia, eventually becoming a professor and later serving as Vice-Chancellor of the **Universiti Kebangsaan Malaysia**, one of the country's leading research universities. During his tenure, he strengthened the university's research capacity and international collaborations, particularly in the fields of environmental science and biotechnology.

Prof. Zakri gained global recognition through his leadership in international science-policy platforms. He served as Director of the **United Nations University Institute for Advanced Studies** in Yokohama, Japan, where he led interdisciplinary programs addressing biodiversity, ecosystems, and sustainable development. Under his guidance, the institute became a key hub for advancing knowledge on the links between science, policy, and society.

One of his most influential roles was as Co-Chair of the **Millennium Ecosystem Assessment**, a landmark international initiative involving over 1,300 scientists worldwide. The assessment

provided the first comprehensive evaluation of the world's ecosystems and their impact on human well-being, shaping global environmental discourse and informing policy frameworks at multiple levels.

In addition to his academic and international work, Prof. Zakri has played a pivotal role in shaping science and innovation policy in Malaysia. He served as Science Advisor to the Prime Minister and was instrumental in guiding national strategies on science, technology, and sustainability. He also chaired the Malaysian Biotechnology Corporation, promoting innovation and investment in the country's bioeconomy sector.

His engagement with global institutions includes active collaboration with **UNESCO**, where he has supported science diplomacy, education, and capacity-building initiatives, particularly in developing countries. He has also contributed to numerous international panels and advisory bodies focused on biodiversity, sustainability, and the interface between science and policy.

Prof. Zakri Abdul Hamid is widely regarded as a bridge between scientific research and policymaking. His work emphasizes the importance of evidence-based decision-making, international cooperation, and the integration of environmental considerations into development planning. Over the course of his career, he has received numerous honors and recognitions for his contributions to science and global sustainability.

Through his leadership, scholarship, and advocacy, Prof. Zakri has left a lasting impact on both national and international efforts to promote sustainable development, protect biodiversity, and harness science for the benefit of humanity. Prof. Zakri was elected as a Fellow of the IAS in 2006.

# CYCLAMEN PERSICUM BULB EXTRACT MODULATES NF- $\kappa$ B, OXIDATIVE STRESS, AND APOPTOTIC PATHWAYS IN TRIPLE-NEGATIVE BREAST CANCER\*

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## Abstract:

**Background/Objectives:** Triple-negative breast cancer (TNBC) is an aggressive breast cancer subtype associated with poor prognosis and limited targeted therapeutic options. Natural products, rich in bioactive phytochemicals, represent a potential source of novel anticancer agents. This study examined the phytochemical profile and anticancer activity of an ethanolic bulb extract of *Cyclamen persicum* (CPE), with a primary focus on TNBC. **Methods:** The phytochemical composition of CPE was analyzed by liquid chromatography–mass spectrometry (LC–MS). Antioxidant activity was evaluated using DPPH radical scavenging assay. The anticancer effects of CPE were assessed mainly in MDA-MB-231 TNBC cells using MTT cell viability assays, Ki-67 immunoblotting, Western blot analysis of signaling proteins, wound healing migration assays, Matrigel invasion assays, adhesion assays and cell–cell aggregation assays. Antiproliferative activity was also examined in 22RV1 (prostate), Capan-2 (pancreatic), and HCT116 (intestinal) cancer cell lines using MTT assays. **Results:** LC–MS analysis indicated that the extract contains multiple polyphenolic and organic acid constituents commonly associated with bioactivity. Consistent with this profile, CPE demonstrated strong antioxidant activity. In MDA-MB-231 cells, CPE significantly reduced cell viability and proliferation, accompanied by decreased Ki-67 expression. Treatment was associated with modulation of proteins involved in proliferative and survival signaling, induction of apoptosis-related markers, and reduced migratory and invasive capacities. CPE also promoted cell–cell homotypic aggregation, suggesting a shift toward a less aggressive phenotype. These effects were associated with reduced phosphorylation of p65, indicating possible modulation of NF- $\kappa$ B signaling. Additionally, CPE decreased proliferation in 22RV1, Capan-2, and HCT116 cancer cell lines. **Conclusions:** Collectively, these findings indicate that *C. persicum* bulb extract exerts multimodal anticancer effects in vitro, particularly in TNBC cells, and highlights its potential as a source of bioactive compounds warranting further mechanistic and translational investigation.

**Keywords:** triple negative breast cancer; *Cyclamen persicum*; apoptosis; NF- $\kappa$ B

\* <https://www.mdpi.com/1424-8247/19/3/388>

## ANTI-INFLAMMATORY ACTIVITY OF *MANDRAGORA AUTUMNALIS* ETHANOLIC EXTRACT: IN VITRO AND CELLULAR MECHANISTIC INSIGHTS\*

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### Abstract:

Plant-based remedies have been employed since ancient times to manage and prevent a wide range of diseases. **Background:** Their bioactive constituents provide natural alternatives to synthetic anti-inflammatory drugs, often with reduced toxicity and multiple biological benefits. *Mandragora autumnalis*, a medicinal plant rich in secondary metabolites, has not been extensively investigated for its anti-inflammatory properties. **Methods:** The anti-inflammatory activity of *Mandragora autumnalis* ethanolic extract (MAE) was evaluated using in vitro biochemical assays, including heat-induced protein denaturation (casein and bovine serum albumin) and red blood cell membrane stabilization. Cellular anti-inflammatory effects were assessed in LPS-stimulated RAW 264.7 macrophages by measuring nitric oxide production, pro-inflammatory cytokine levels, macrophage migration, gene and protein expression of inflammatory mediators, and the activation status of NF- $\kappa$ B, STAT3, and MAPK signaling pathways.

**Results:** Preliminary screening revealed that MAE effectively inhibited heat-induced protein denaturation (casein and bovine serum albumin) and heat-induced red blood cell (RBC) hemolysis, indicating strong protein- and membrane-stabilizing properties associated with anti-inflammatory activity. In lipopolysaccharide (LPS)-stimulated RAW 264.7 macrophages, MAE markedly suppressed the inflammatory response by downregulating the expression of inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2), leading to a significant reduction in nitric oxide (NO) production and pro-inflammatory cytokines, including tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and interleukin-6 (IL-6). Furthermore, MAE inhibited macrophage migration and attenuated key inflammatory signaling pathways, notably nuclear factor kappa B (NF- $\kappa$ B), signal transducer and activator of transcription 3 (STAT3), and mitogen-activated protein kinases (MAPKs). Molecular docking analysis was conducted to explore the potential interactions between the most abundant chemical compounds and key proteins involved in inflammatory signaling pathways, including ERK and iNOS. **Conclusions:** Overall, these results indicate that MAE exhibits strong anti-inflammatory activity by stabilizing proteins, protecting cellular membranes, and inhibiting key inflammatory mediators and signaling pathways. These findings highlight its potential as a natural therapeutic candidate for the prevention and management of chronic inflammation-related disorders, such as arthritis, cardiovascular diseases, and cancer. However, further mechanistic investigations and in vivo studies are required to confirm its therapeutic potential and clinical relevance.

**Keywords:** *Mandragora autumnalis*; inflammation; nitric oxide; cytokine modulation; membrane stabilization; MAPK signaling pathways

\* <https://www.mdpi.com/1424-8247/19/3/483>

# BRAIN HEALTH IN ISLAMIC COUNTRIES THROUGH BIG DATA AND NEUROIMAGING COLLABORATION

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## ABSTRACT

The value of big data in neuroimaging of people with brain health problems: how Islamic countries can collaborate to prevent or even cure brain diseases. As of early 2026, the global Muslim population is estimated at approximately 2.06 billion to 2.1 billion people, representing 26% of the world's population. Islamic-majority countries span diverse geographic, cultural, and socioeconomic contexts, yet they share a growing burden of brain-related disorders, including mental illness, stroke, traumatic brain injury (TBI), and infections affecting the central nervous system. Population-weighted prevalence and incidence estimates derived from World Health Organization and Global Burden of Disease comparative risk assessments suggest that these conditions constitute a substantial and persistent challenge across the life course—from youth to old age (GBD 2019 Stroke Collaborators, 2021; Lewison et al., 2021).

## Keywords:

Brain health; Neuroimaging; Neuroinformatics; Mental illness; Stroke

## BURDEN OF BRAIN-RELATED DISORDERS IN ISLAMIC COUNTRIES

### Mental Illness

Mental illness affects a significant proportion of the population across age groups in Islamic countries. Among youth aged 15–24 years, prevalence is estimated at 10–14% in males and 15–20% in females, reflecting a consistently higher burden among young women. In adults aged 25–59 years, prevalence ranges from 8–12% in males and 12–18% in females, while among the elderly (60 years and above) it remains substantial at 7–11% in males and 10–16% in females. These figures underscore the need for age- and gender-sensitive mental health strategies supported by neuroimaging and data-driven approaches. Bibliometric analyses of Organisation of Islamic Cooperation (OIC) countries demonstrate a mismatch between research productivity and disease burden in mental health, highlighting opportunities for coordinated neuroinformatics collaboration (Lewison et al., 2021).

### Stroke

Stroke prevalence increases markedly with age across Islamic countries. Among youth, stroke prevalence remains low at below 0.2% for both males and females. However, in adults, prevalence rises to approximately 1.5–3% in males and 1–2.5% in females. The burden is greatest among the elderly, with prevalence estimates of 9–16% in males and 7–14% in females. These epidemiological patterns are consistent with global and regional analyses demonstrating stroke as a leading contributor to mortality and disability in many Muslim-majority regions (GBD 2019 Stroke Collaborators, 2021).

### Traumatic Brain Injury (TBI)

Traumatic brain injury shows a distinct gender and age distribution. Among youth, TBI prevalence is estimated at 10–15% in males and 5–8% in females, reflecting higher exposure to injury risk among young males. In adults, prevalence decreases slightly to 7–11% in males and 4–7% in females, while in the elderly it increases again to 8–12% in males and 6–9% in females, likely due to falls and age-related vulnerability. Global bibliometric analyses of neurological research trends emphasize growing attention to multimodal neuroimaging approaches in TBI and related disorders (Wang et al., 2025).

### Infectious Diseases Affecting the Brain

Infectious diseases with neurological involvement remain a significant concern across several Islamic-majority countries, particularly in regions with high communicable disease burdens. Among youth, prevalence is estimated at 14–22% in males and 16–25% in females. In adults, prevalence ranges from 12–18% in males and 14–22% in females, while the elderly experience the highest burden, with estimates of 20–28% in males and 22–30% in females. These trends reinforce the importance of surveillance, epidemiological mapping, and neuroimaging-supported diagnostics in infection-related brain disorders, particularly in low- and middle-income contexts (Dardas et al., 2023).

### NEUROINFORMATIC/BIG DATA COMING FROM ISLAMIC COUNTRIES USING MRI, EEG, FNIRS AND FMRI (2020-2025)

The last five years have seen a steady increase in neuroimaging-related research output from Islamic-majority countries, although data sharing remains fragmented. Based on bibliometric analyses and available public datasets, the following approximate estimates describe neuroinformatics and big-data activity from 2020 to 2025 (Abdelwahab et al., 2025; Dardas et al., 2023).

MRI-related research dominates the landscape, with an estimated 5,000–8,000 peer-reviewed publications, encompassing both clinical and experimental studies. EEG represents the most visible modality in terms of open data, with approximately 55,000 EEG signal segments

publicly released through dedicated datasets, particularly those related to language and cognitive research. fMRI studies are widely reported in the literature, with an estimated 200–500 studies referencing functional imaging data, although only a fraction include openly shared datasets. In contrast, fNIRS data sharing remains limited, with few publicly accessible datasets despite growing research interest. Combined multimodal datasets integrating EEG, MRI, or fMRI remain relatively rare, with fewer than 100 identifiable studies, reflecting early-stage development of integrated neuroinformatics infrastructures (Wang et al., 2025).

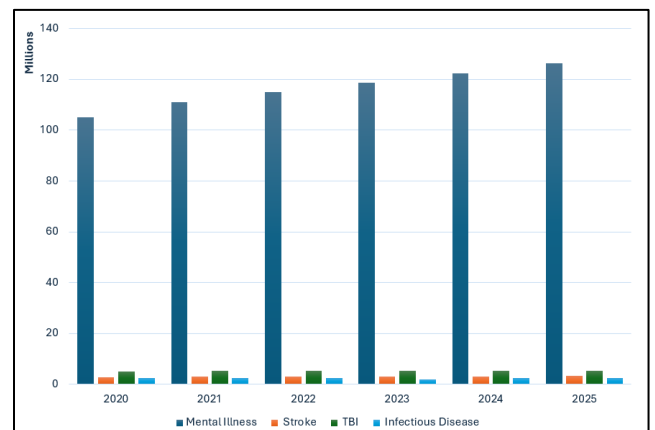


Fig.1 Disease Trends in Muslim-Majority Countries (2020-2025).

### ISLAMIC COUNTRIES WITH HIGHEST PUBLICATION ON BRAIN DATA-BASED MRI, EEG, FNIRS, FMRI AND MEG

Within the Islamic world, research productivity in brain imaging and neuroinformatics is unevenly distributed but demonstrates clear regional leaders. Turkey has emerged as one of the most significant contributors to clinical neurology and neuroscience research among Islamic-majority countries. Bibliometric analyses indicate sustained growth in indexed publications in neurology and neuroscience categories over the past decade, with major academic institutions such as Istanbul University and Hacettepe University contributing substantially to MRI- and EEG-related research outputs (Abdelwahab et al., 2025). Turkey's strong presence in international neurology and neurosurgery journals further reflects its expanding influence in neuroimaging-based research.

In the Arab region, Egypt ranks among the top producers of MRI and neuroimaging-related publications. A 25-year bibliometric analysis of magnetic resonance imaging research in Arab countries identified Egypt as one of the most prolific contributors, second only to Saudi Arabia in total MRI publications, with Cairo University and Ain Shams University serving as leading institutional hubs (Albadayneh et al., 2024). Broader regional bibliometric mapping of Middle Eastern research productivity further confirms Egypt's sustained contribution to medical and neuroscience scholarship (Dardas et al., 2023).

Beyond these major hubs, Malaysia and Morocco each contribute an estimated ~10,000+ publications, reflecting active research bases in science, engineering, and medical fields that overlap with neuroimaging and applied neuroscience.

Indonesia, while not yet ranking among the highest producers of MRI or fMRI publications globally, demonstrates emerging capacity in neuroimaging-adjacent domains, particularly EEG-based signal processing and computational neuroscience applications. Regional and international bibliometric trends suggest growing participation from Southeast Asian Muslim-majority countries in applied neuroscience and biomedical engineering research, although large-scale multimodal neuroimaging datasets remain limited (Abdelwahab et al., 2025; Dardas et al., 2023).

Collectively, these patterns indicate that high-volume neuroimaging publication output within Islamic-majority countries is currently concentrated in Turkey, Egypt, Saudi Arabia, and Iran, while countries such as Indonesia and Malaysia show expanding but comparatively developing research ecosystems. Strengthening collaborative neuroinformatics infrastructures across these nations could significantly enhance shared data repositories and multimodal brain research capacity (Albadayneh et al., 2024; Abdelwahab et al., 2025).

**What should Islamic countries do as a collaborative effort to solve brain, mind, psychological and clinical neurosciences diseases from 2026 onwards via the Islamic Academy of Sciences?**

From 2026 onwards, Islamic countries should pursue a unified, data-driven strategy to address brain, mind, psychological, and clinical neuroscience diseases under the coordination of the Islamic Academy of Sciences (IAS). With a global Muslim population of approximately 2.06–2.1 billion people (about 26% of the world's population), Islamic-majority countries collectively face a high burden of brain-related disorders, including mental illness, stroke, traumatic brain injury (TBI), and neuroinfectious diseases. Mental illness affects up to 20% of youth and remains prevalent across adulthood and old age, while stroke prevalence rises sharply in the elderly, reaching up to 16% in men, and neuroinfectious conditions affect up to 30% of older women, consistent with global and regional burden analyses (GBD 2019 Stroke Collaborators, 2021; Lewison et al., 2021).

IAS should therefore establish an Islamic Brain, Mind and Neuroscience Consortium linking major research hubs such as Turkey, Egypt, Saudi Arabia, and Iran with emerging ecosystems in Malaysia, Indonesia, and Morocco. This consortium should be supported by a shared Islamic NeuroData and Imaging Cloud integrating MRI, fMRI, EEG, and fNIRS data. Despite producing an estimated 5,000–8,000 MRI-related publications and releasing around 55,000 EEG signal segments between 2020 and 2025, Islamic countries still have very limited multimodal and openly integrated datasets, restricting the use of big data and artificial intelligence in clinical neuroscience (Dardas et al., 2023; Wang et al., 2025).

In parallel, IAS should lead a pan-Islamic brain disease surveillance system and develop regional multimodal neuroimaging centers of excellence focusing on high-burden conditions such as stroke, TBI, and mental illness. Integrating mental health and neuroscience into primary care, alongside investment in AI and computational neuroscience governed by Islamic ethical principles, would improve early detection, reduce disability, and enhance public trust. Collectively, these coordinated efforts would reduce long-term health and economic burdens while positioning the Islamic Academy of Sciences as a global leader in collaborative, ethically grounded brain health research (Albadayneh et al., 2024; Abdelwahab et al., 2025).

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## BEING WITHIN NOTHINGNESS

A PHILOSOPHICAL PERSPECTIVE:  
A SCIENTIFIC AND PHILOSOPHICAL  
REFLECTION ON VACUUM AND HEAT

**SEYED KAZEM ALAVIPANAH**

*Professor, University of Tebran*



*“Throughout your life you have tested your existence;  
perhaps once you should also test non-existence.”*

*Rumi*

Late one night a reddish flash appeared in the sky, and a fraction of a second later a thunderous sound shattered the silence. In that moment I witnessed how rapidly what we call “being” can collapse into apparent nothingness. What seemed stable only seconds earlier dissolved before my eyes. That moment compelled me to reflect upon one of the most fundamental questions in human thought: what is the relationship between being and nothingness?

Philosophy has long struggled with this question. Martin Heidegger famously asked: “Why is there something rather than nothing?” For him, confronting nothingness reveals the depth of being itself.

Hegel proposed that pure being and pure nothingness are inseparable conceptual moments whose unity generates becoming. In this dialectical movement, reality is understood not as static objects but as a dynamic process of transformation. Islamic philosophy also developed profound reflections on existence.

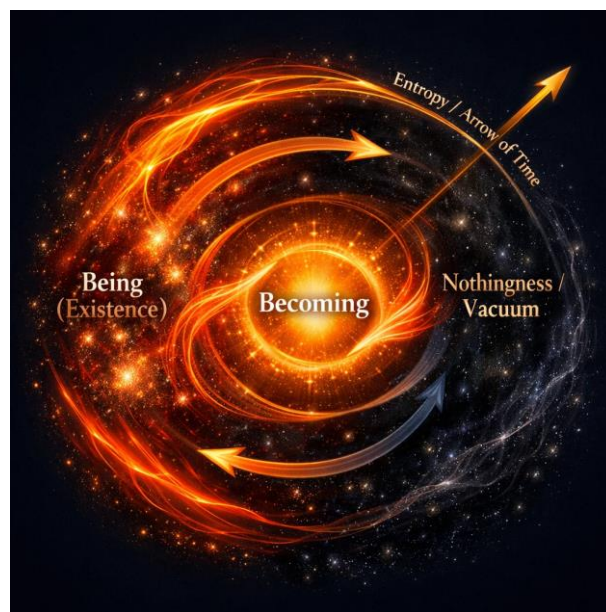
Mulla Sadra proposed the doctrine of the primacy of existence and the gradation of being. In this view, reality consists of degrees of existence rather than separate substances, while non-existence represents the limit or horizon of manifestation.

Modern physics has also transformed our understanding of “nothing.” In classical physics the vacuum was thought to be empty space. Quantum field theory, however, reveals that even the vacuum is filled with fluctuating fields where virtual particles continuously appear and disappear. The quantum vacuum is therefore not absolute nothingness but a sea of potentiality. Some cosmological theories even suggest that the universe itself may have emerged from quantum fluctuations of the vacuum. If so, the boundary between being and nothingness becomes profoundly subtle.

Thermodynamics provides another key perspective. Every physical process involves energy exchange, and heat is one of the most universal forms through which this exchange manifests. The second law of thermodynamics states that entropy increases in closed systems, yet in open systems far from equilibrium energy flows can generate complex structures.

Ilya Prigogine demonstrated that such energy gradients can produce self-organizing structures. These “dissipative structures” illustrate how order can arise from thermodynamic processes. From this viewpoint we may advance a conceptual hypothesis: heat can be considered a universal indicator of transformation in nature. Every change in the universe leaves a thermal trace. From stellar formation in nebulae to metabolic activity in living organisms and neural processes in the human brain, all transformations involve energy flow and heat exchange. At the cosmological scale, the cosmic microwave background radiation represents the thermal echo of the early universe. At the biological scale, life persists through continuous energy exchange with its environment. Even human thought is accompanied by measurable metabolic heat in the brain. Heat, therefore, may be regarded as the silent language of change in the universe.

In this sense, speaking about the “intelligence of the universe” does not imply conscious awareness but rather refers to the inherent capacity of nature to generate order, complexity, and structure through physical processes. Reality may thus be seen as a dynamic network of interacting processes where matter, energy, and information continuously evolve. The boundary between being and nothingness is not a rigid line but a shifting horizon of possibilities.



*conceptual philosophical-scientific diagram illustrating relationships between Being, Nothingness, Becoming, and Heat as change indicator; circular or spiral composition; center glowing node labeled 'Becoming'; one side 'Being (Existence)' with cosmic imagery like stars and matter; opposite side 'Nothingness / Vacuum' with dark quantum vacuum texture and subtle fluctuations; arrows flowing between Being and Nothingness forming a dynamic loop; heat and energy flow represented by red-orange gradients and wave lines connecting processes; entropy arrow of time moving outward; elegant academic infographic style, minimal text, deep blue black background, golden and red highlights, mix of science and philosophy aesthetics (GPT-IMAGE-1.5)*

Ultimately, understanding this profound relationship may require the convergence of multiple domains of knowledge. Science measures and explains phenomena; philosophy interprets their meaning; and art and spirituality express their experiential depth. Perhaps only through the dialogue between science, philosophy, and art can humanity approach a deeper understanding of existence itself.

# HIGHER EDUCATION IN THE ARAB WORLD: ARTIFICIAL INTELLIGENCE

**Adnan Badran** *Chief Editor*  
**Elias Baydoun • Sandra Hillman • Joelle Mesmar** *Editors*

## Higher Education in the Arab World Artificial Intelligence

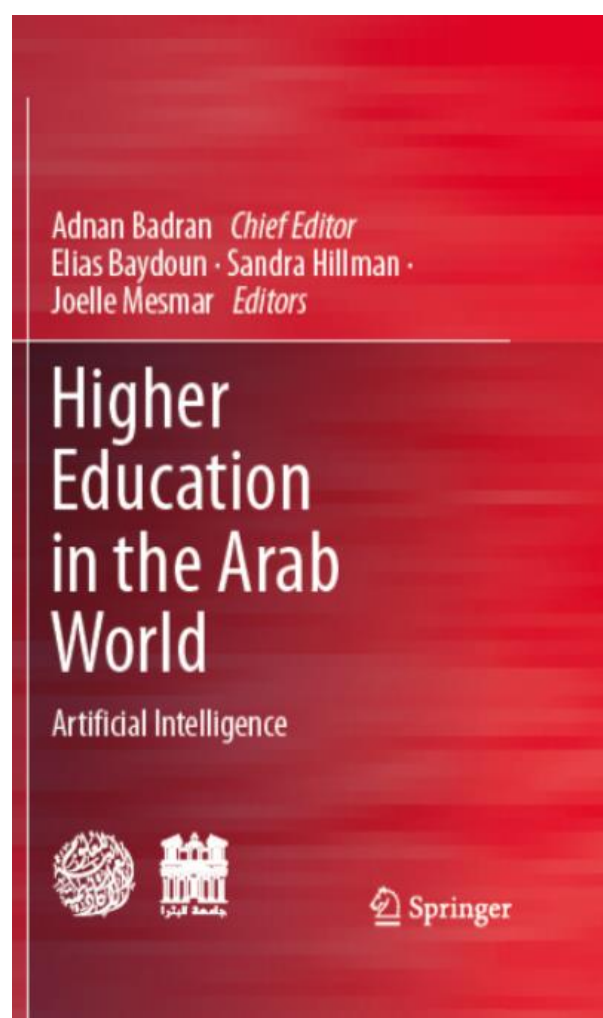
The term Artificial Intelligence (AI) was first coined in 1956 by John McCarthy who is considered to be the father of AI. He defined AI as “*the science and engineering of making intelligent machines*”. Since then, AI has metamorphosed into computing systems characterized by “*human-like processes such as learning, adapting, synthesizing, self-correction and the use of data for complex processing tasks*”.

Within the higher education landscape, AI is emerging as a powerful change agent often referred to as AI in Education (AIEd). Grasping the essence of AIEd within the higher education milieu is imperative. Commonly described as the advent of the ‘Smart University’, AIEd represents a paradigm shift in the operational ethos of Universities and Colleges.

Smart Universities in the context of AIEd are marked by several key characteristics. With regards to admissions and enrollment, AIEd tools can harness data on a plethora of metrics including recruitment, retention and graduation outcomes. Teaching and learning are now entering an era of personalization and adaptability, thanks to the facilitative role of AIEd instruments. These digital tools are instrumental in pin-pointing at-risk scholars, projecting academic trajectories, ensuring originality via plagiarism checks and guiding course selection.

Researchers are also benefiting from AIEd tools to sift through large data banks and analyze and identify patterns and insights that can inform their practice. Administrative spheres similarly reap the benefits of AIEd's prowess, yielding heightened efficiency in operations, financial stewardship and resource management—an endeavor that alleviates administrative load and, consequently, relocates fiscal resources towards educational and research priorities.

AIEd is also designed to optimize human resource processes from recruitment and onboarding to performance evaluation and career development. These systems use AI and digital tools to make human resource functions more efficient, data driven and employee focused.



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## ZAIDAN KAFABI AND YARMOUK UNIVERSITY: A SCHOLARLY PATH IN FOUNDATION AND ACADEMIC RENEWAL<sup>♦</sup>

**ADNAN BADRAN**

*President, Islamic World Academy of Sciences  
and President, Arab Academy of Sciences*



The impact of a true academic cannot be reduced to a functional listing of positions or a tally of formal achievements. Its deeper significance is revealed in the lasting imprint left on institutional consciousness, on the culture of research and teaching, and on the generations who graduate from the university carrying its scientific and human values.

Yarmouk University was founded on a vision that went beyond the traditional role of a degree-granting institution, aspiring instead to become a research-oriented university open to the humanities, social sciences, and natural sciences, and engaged with local and national societal issues. From the outset, its philosophy was grounded in the principle of the integration of knowledge and the bypassing of rigid boundaries between disciplines - an approach now strongly emphasized in contemporary academic literature.

Within this intellectual context, Dr. Zaidan Kafafi joined Yarmouk University in 1982, during what may be described as its “second founding phase,” when the university transitioned from initial establishment to consolidating its academic identity. His appointment was not merely a quantitative addition to the faculty, but a qualitative

enrichment, bringing scientific expertise and a research methodology that contributed to shaping the trajectory of some of the university’s most significant academic projects.



*Prof. Zeidan Kafafi.*

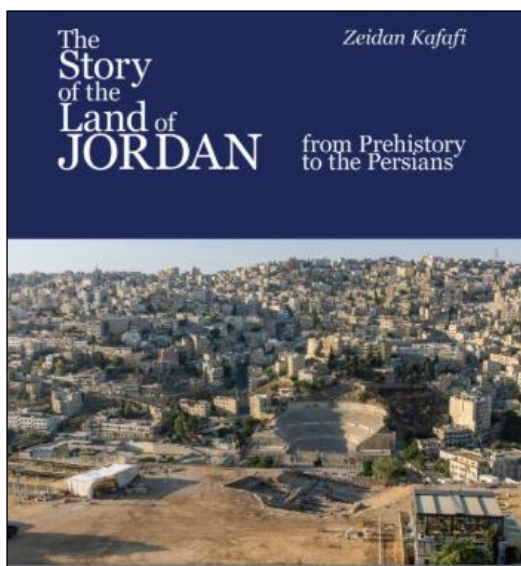
Dr. Kafafi’s impact became particularly evident in the postdoctoral phase, when an academic’s scholarly project takes shape, and the transition occurs from knowledge reception to knowledge production and institutional influence. From his early years, he engaged in teaching, research, and university service with a spirit of teamwork, linking higher education with field research, and combining scientific rigor with intellectual openness, dialogue, and interdisciplinary engagement.

A pivotal milestone in the study of archaeology and humanity was the establishment of the Institute of Archaeology and Anthropology and its museum at Yarmouk University in 1984. Zaidan Kafafi played a central role in this initiative, which was founded on the core idea that the study of material remains cannot be separated from the study of human beings and their social and cultural contexts. The institute was established in a spirit of collective work under the leadership of Prof. Muawiya Ibrahim,

<sup>♦</sup> A speech delivered during the Abdul Hameed Shoman Foundation “Guest of the Year” Program honoring the Archeologist Prof. Zeidan Kafafi for his research and studies in Archeology and Anthropology in Jordan and the Middle East, held on 7 February 2026 at the Abdul Hameed Shoman Foundation, Amman, Jordan.

with the participation of their anthropologist colleague Dr. Satanay Shami, along with Dr. Gary Rollefson, offering an advanced academic model of integrated knowledge. This institute became a regional center for study and research, attracting students and scholars from Jordan and beyond, and contributing to the graduation of generations of specialists who now work in universities, departments of antiquities, and cultural institutions. This model aligns with the findings of the Organisation for Economic Co-operation and Development (OECD), which emphasize the importance of interdisciplinary education in fostering critical thinking, analytical research, and the connection between theory and practice.

Dr. Kafafi's contributions extended to field research and archaeological excavation, where he participated in research teams working at important sites such as Tell Deir 'Alla and Tell ath-Thawab. He also contributed to strengthening research collaboration with leading European universities, notably the University of Tübingen in Germany and Leiden University in the Netherlands. Furthermore, he helped establish field research stations affiliated with the Institute of Archaeology and Anthropology, which contributed to understanding the successive civilizations that passed through the land of Jordan, highlighting its historical role as a civilizational corridor linking Asia, Africa, and Europe.



**The Story of the Land of Jordan** Zeidan Kafafi  
*Published in cooperation with the Ministry of Tourism and Antiquities of the Hashemite Kingdom of Jordan  
 Amman: The American Center of Research and the Ministry of Tourism and Antiquities, 2025*

His recent book, *The Story of the Land of Jordan*, launched under the patronage and in the presence of His Royal Highness Prince El Hassan bin Talal, underscores Jordan's role as a major passageway for successive civilizations over thousands of years, both before and after Christ. It documents Jordan's deep-rooted contribution to the formation of civilizations, visible in Petra of the Nabataeans; in the castles of Karak, Rabadh, and Shobak of the Crusaders; in Umm Qais, Jerash, and Philadelphia of the Byzantine and Roman periods; and in the Islamic and Arab heritage reflected in Qusayr Amra and Harrana, as well as in Aqaba, Ma'an, and other Jordanian cities under the Hashemites in building modernity for present and future generations.

On the human and educational level, Zaidan combined scientific rigor with personal humility. He was a valued academic colleague and a loyal friend during my time at Yarmouk, distinguished by his wit and enduring sense of humor, expressed in his own unique way. Zaidan Kafafi's project was not purely academic; it carried a clear cultural and societal dimension, affirming that the study of the past is integral to building the present and the future, and that archaeological knowledge is a pillar of cultural identity and tourism development. This orientation aligns with Yarmouk University's mission in continuing education and community service, through the establishment of specialized centers, the provision of training and consultancy, and contributions to sustainable development.

To speak of Zaidan is to speak of a comprehensive academic experience, one that was intertwined with Yarmouk University during its founding and growth, and that contributed to consolidating a model of a university open to knowledge, rooted in its society, and connected to the world. Honoring him today is not merely a tribute to an individual, but a celebration of a generation of academics who believed that higher education and scientific research constitute a long-term national project.

In this context, the pioneering role of the Abdul Hameed Shoman Foundation stands out in documenting Jordan's scientific memory and honoring its distinguished figures, thereby helping to transmit this experience to future generations. My sincere thanks to all of you.

# TÜBA ACADEMY PRIZES 2026 NOMINATIONS



The poster features the TÜBA logo at the top, followed by the text 'TURKISH ACADEMY OF SCIENCES'. Below this is a red banner with '2026 TÜBA ACADEMY PRIZES' in white. The central focus is 'NOMINATION DEADLINE 15<sup>th</sup> MAY 2026'. A circular graphic with a map of Turkey and the text 'TÜBA AKADEMİSİ' and 'TÜBA AKADEMİSİ' is surrounded by several text boxes providing details about the prizes, nomination process, and laureates. At the bottom, contact information and social media links are provided.

TÜBA  
TURKISH ACADEMY OF SCIENCES

2026  
TÜBA ACADEMY PRIZES

NOMINATION DEADLINE  
15<sup>th</sup> MAY  
2026

TÜBA Academy Prizes are annually awarded to the nominated scientists in three categories of sciences namely:

- Basic and Engineering sciences
- Health and Life sciences
- Social Sciences and Humanities.

Nominations are made by TÜBA members, science academies and inter-academy organizations and other international science institutions which are related with TÜBA.

The nominees are evaluated by Prize Committees composed of TÜBA members and renowned scientists.

Original, leading and path-breaking works

Turkish citizen scientists as well as foreign nationals can be nominated for TÜBA Academy Prizes, provided that foreign national nominee has conducted studies related to Türkiye, has collaborated with scientists and scientific organizations in Türkiye, and has conducted joint scientific studies with Turkish citizen scientists.

2025 Prize Laureates:  
Health and Life Sciences:  
Prof. Dr. Mulu Geten of University of Zurich, Switzerland  
Prof. Dr. Dietl M. Hermann of University of Essen, Germany

TÜBA Academy Prizes are open to all scientists.

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The nomination process for the 2026 International TÜBA Academy Awards, established within TÜBA's mission to encourage and recognize scientists, has commenced. Nominations will continue until **15 May 2026**.

The International TÜBA Academy Awards are presented annually in three categories, which are: Science and Engineering Sciences, Health and Life Sciences, and Social Sciences and Humanities.

The awards are granted to scientists who have produced original, pioneering, and groundbreaking work in their respective fields. By decision of the Academy Council, nominees for the TÜBA Academy Awards may be proposed from the international community for both Turkish citizens and foreign nationals, provided that they have conducted work related to Türkiye and have collaborated with scientists and scientific institutions in Türkiye. The awards in all three categories are open to all scientists in Türkiye and around the world.

Nominations for the International TÜBA Academy Awards may be submitted by TÜBA members; Rectorates of universities in Türkiye; science academies with which TÜBA maintains relations; international umbrella organizations of academies; and scientific institutions invited by the Presidency of the Academy. Current TÜBA members, employees, and scientists involved in the evaluation processes are not eligible for nomination. In addition, nominees proposed for the Academy Awards must not have received another national and/or international science award granted by public institutions and organizations in Türkiye within the last three years.

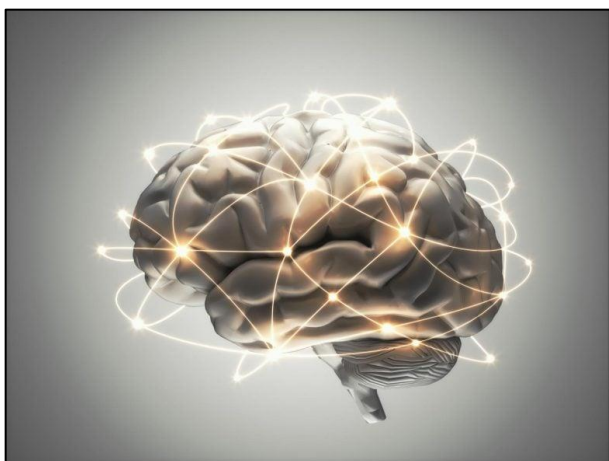
The award recipients are determined by the Academy Council on the basis of evaluations by domestic and international referees and the assessments of the field committees. As defined in the Procedures and Principles of the Academy Awards, the awards consist of the Academy Award Medal and Certificate, together with a monetary prize determined each year by the Academy Council, and will be conferred upon the recipients at a ceremony held under the auspices of the Presidency of the Republic of Türkiye at the Presidential Complex.

Email: [academy.prizes@tuba.gov.tr](mailto:academy.prizes@tuba.gov.tr)

<https://tuba.gov.tr/en/tuba-awards/tuba-academy-prizes/nominations-for-2026-tuba-academy-prizes>

### SIMPLE BRAIN TRAINING CUTS DEMENTIA RISK DECADES LATER, STUDY FINDS\*

**Speed-of-processing cognitive training in older adults significantly reduced dementia risk over 20 years, outperforming memory and reasoning training. Its adaptive, implicit learning approach may explain the benefit.**



Adults ages 65 and older who completed five to six weeks of cognitive speed training, known as speed of processing training, were less likely to develop dementia, including Alzheimer's disease, even up to 20 years later. This training helps people quickly identify visual information on a computer screen and manage increasingly complex tasks in less time.

Participants who also completed follow-up sessions one to three years later showed the greatest benefit, according to findings published in *Alzheimer's & Dementia: Translational Research and Clinical Interventions*.

This NIH-funded study is the first randomized clinical trial to examine the link between cognitive training and dementia risk over two decades. It followed participants from the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study, which began in 1998-99 with 2,802 adults.

Researchers compared three types of cognitive training - memory, reasoning, and speed of processing - against a control group with no training. Participants in the training groups completed up to 10 sessions lasting 60 to 75 minutes over five to six weeks. About half also received up to four additional booster sessions at 11 and 35 months after the initial training.

After 20 years, 40% of participants in the speed training group who received boosters were diagnosed with dementia, compared to 49% in the control group. This represents a 25% lower risk and was the only intervention that showed a statistically meaningful difference.

#### **Study Design, Data, and Dementia Impact**

To reach these conclusions, researchers analyzed Medicare data from 2,021 participants, or 72% of the original group, between 1999 and 2019. The follow-up group closely resembled the original sample. About three-fourths were women, 70% were white, and the average starting age was 74. Over the course of the study, roughly three-fourths of participants died, with an average age of 84.

Dementia involves a decline in thinking abilities that interferes with daily independence. It is estimated to affect 42% of adults over age 55 at some point in life and costs the United States more than \$600 billion annually. Alzheimer's disease accounts for about 60%-80% of cases, while vascular dementia represents 5%-10%. Other forms include Lewy body and frontotemporal dementia, as well as mixed types.

\* Source: <https://scitechdaily.com/simple-brain-training-cuts-dementia-risk-decades-later-study-finds/>

“Seeing that boosted speed training was linked to lower dementia risk two decades later is remarkable because it suggests that a fairly modest nonpharmacological intervention can have long-term effects,” says Marilyn Albert, Ph.D., the corresponding study author and director of the Alzheimer’s Disease Research Center at Johns Hopkins Medicine. “Even small delays in the onset of dementia may have a large impact on public health and help reduce rising health care costs”.

Albert explained that additional studies are needed to understand the underlying mechanisms that may help explain these associations and to understand why the reasoning and memory interventions didn’t have the same 20-year associations.

### **Why Speed Training May Be More Effective**

These results build on earlier findings from the ACTIVE trial, the largest U.S. study of cognitive training in older adults. Previous research indicated that cognitive training improved everyday thinking and decision-making skills for up to five years, and all three types of training were linked to better daily functioning after 10 years. Speed training participants also had a 29% lower risk of dementia after 10 years compared to the control group, with additional reductions seen after each booster session.

Researchers suggest speed training may be especially effective because it adjusts to each person’s performance in real time. Participants who performed well moved on to more challenging tasks, while others progressed at a slower pace. In contrast, memory and reasoning training followed a fixed approach, with all participants learning the same strategies. Speed training also relies on *implicit* learning, which develops skills through repetition and practice, while the other methods focus on *explicit* learning, such as memorizing information. These differences in how the brain processes learning may help explain the results.

“Our findings provide support for the development and refinement of cognitive training interventions for older adults, particularly those that target visual processing and divided attention abilities,” says site principal investigator George Rebok, Ph.D., a lifespan developmental psychologist who creates community programs for healthy aging and is a professor emeritus of mental health at the Johns Hopkins Bloomberg School of Public Health. “It is possible that adding this cognitive training to lifestyle change interventions may delay dementia onset, but that remains to be studied”.

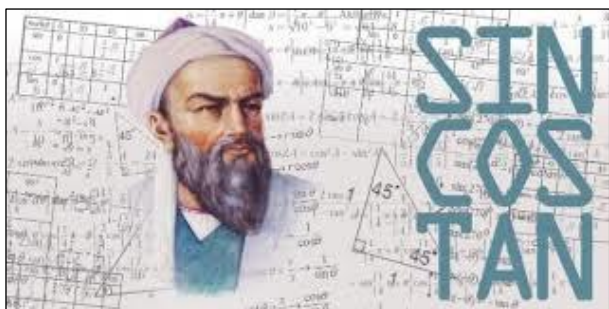
### **Future Research and Lifestyle Synergies**

The researchers also suggest that speed training could work alongside other lifestyle strategies that support brain health, though more evidence is needed. Activities linked to lower cognitive decline risk include maintaining cardiovascular health by managing blood pressure, blood sugar, cholesterol, and body weight, along with regular physical activity.

*Reference: “Impact of cognitive training on claims-based diagnosed dementia over 20 years: evidence from the ACTIVE study” by Norma B. Coe, Katherine E. M. Miller, Chuxuan Sun, Elizabeth Taggart, Alden L. Gross, Richard N. Jones, Cynthia Felix, Marilyn S. Albert, George W. Rebok, Michael Marsiske, Karlene K. Ball and Sherry L. Willis, 9 February 2026, Alzheimer’s & Dementia: Translational Research & Clinical Interventions. DOI: 10.1002/trc2.70197*



## ABUL WAFI MUHAMMAD AL-BUZZANI\* (940-997 AD)



Abul Wafa Muhammad Ibn Muhammad Ibn Yahya Ibn Ismail al-Buzjani was born in Buzjan, Nishapur in 940 AD. He flourished as a great mathematician and astronomer at Baghdad and died in 997/998 AD. He learnt mathematics in Baghdad. In 959 AD he migrated to Iraq and lived there until his death.

Abul Wafa's main contribution lies in several branches of mathematics, especially geometry and trigonometry. In geometry, his contribution comprises the solution of geometrical problems with the opening of the compass; construction of a square equivalent to other squares; regular polyhedra; construction of a regular heptagon taking for its side half the side of the equilateral triangle inscribed in the same circle; construction of a parabola by points and geometrical solution of the equations:

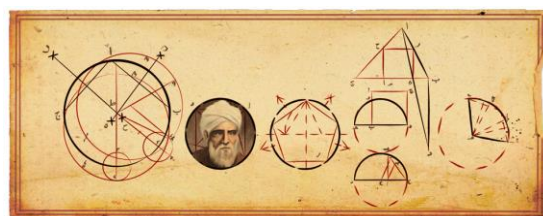
$$x^4 = a \quad \text{and} \quad x^4 + ax^3 = b$$

Abul Wafa's contribution to the development of trigonometry was extensive. He was the first to show the generality of the sine theorem relative to spherical triangles. He developed a new method of constructing sine tables, the value of  $\sin 30^\circ$  being correct to the eighth decimal place. He also developed relations for  $\sin(a+b)$  and the formula:

$$2 \sin^2 \frac{a}{2} = 1 - \cos a, \text{ and}$$

$$\sin a = 2 \sin \frac{a}{2} \cos \frac{a}{2}$$

In addition, he made a special study of the tangent and calculated a table of tangents. He introduced the secant and cosecant *for the first time*, knew the relations between the trigonometric lines, which are now used to define them, and undertook extensive studies on conics.



Apart from being a mathematician, Abul Wafa also contributed to astronomy. In this field, he discussed different movements of the moon, and discovered 'variation'. He was also one of the last Arabic translators and commentators of Greek works.

He wrote a large number of books on mathematics and other subjects, most of which have been lost or exist in modified forms. His contribution includes *Kitab 'Ilm al-Hisab*, a practical book of arithmetic, *al-Kitab al-Kamil* (the Complete Book), *Kitab Al-Handsa* (Applied Geometry). Apart from this, he wrote rich commentaries on Euclid, Diophantos and al-Khawarizmi, but all of these have been lost. His books now extant include *Kitab 'Ilm al-Hisab*, *Kitab al-Handsa* and *Kitab al-Kamil*.

His astronomical knowledge on the movements of the moon has been criticised in that, in the case of 'variation', the third inequality of the moon, as he discussed, was the second part of the 'evection.' But, according to Sedat, what he discovered was the same that was discovered by Tycho Brache six centuries later. Nonetheless, his contribution to trigonometry was extremely significant in that he developed the knowledge of the tangent and introduced the secant and cosecant for the first time. In fact, a sizeable part of today's trigonometry can be traced back to him.

\* Source: *Personalities Noble, 2<sup>nd</sup> Edition, 2000, Edited by Hakim Mohammed Said, published by LAS with permission of Hamdard Foundation Pakistan.*

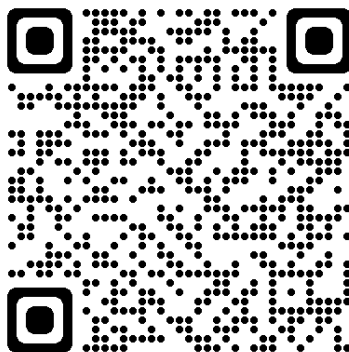
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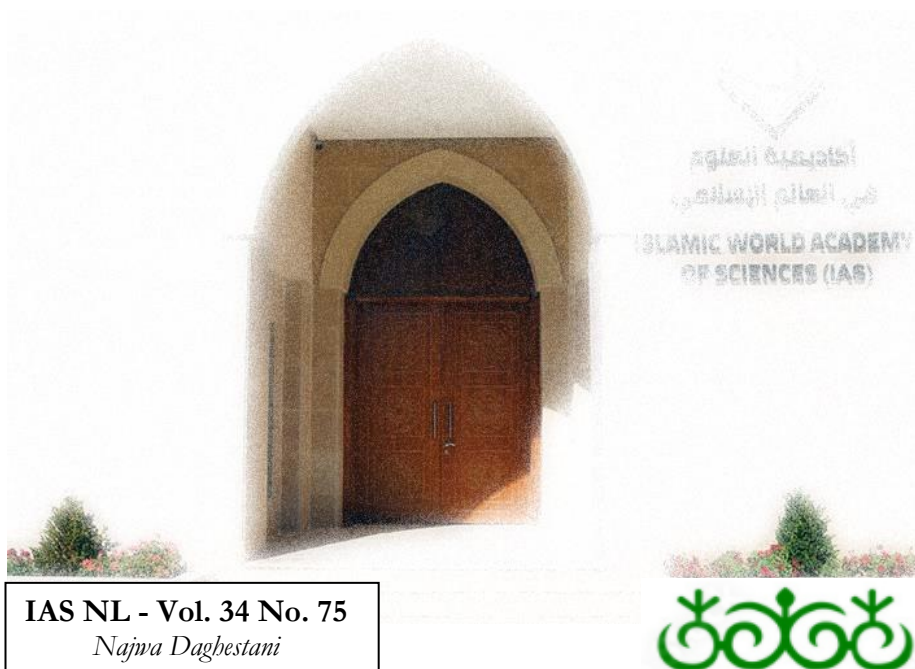
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