

## A NEW METHOD FOR REMOVING TEXTILE DYES FROM WASTEWATER

An environmentally friendly and low-cost novel hybrid material was developed for the removal of the Basic Blue 3 dye from wastewater and textile samples. Thanks to this magnetically responsive material produced under laboratory conditions, dye pollutants were rapidly separated from water and successfully degraded with an efficiency of 96.8% under light conditions similar to sunlight. Owing to its magnetic structure, the system can be reused multiple times and is expected to offer an effective solution for protecting water resources.

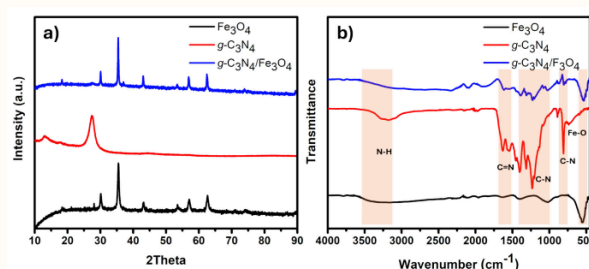


Fig. 1 a) XRD patterns of  $\text{Fe}_3\text{O}_4$  NPs,  $\text{g-C}_3\text{N}_4$  NPs, and  $\text{g-C}_3\text{N}_4$ @ $\text{Fe}_3\text{O}_4$  NPs. b) FTIR spectra of  $\text{Fe}_3\text{O}_4$  NPs,  $\text{g-C}_3\text{N}_4$  NPs, and  $\text{g-C}_3\text{N}_4$ @ $\text{Fe}_3\text{O}_4$  NPs.

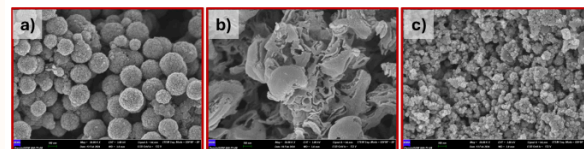


Fig. 2 a) SEM image of  $\text{Fe}_3\text{O}_4$  NPs (scale bar: 100 nm). b) SEM image of  $\text{g-C}_3\text{N}_4$  NPs (scale bar: 1  $\mu\text{m}$ ). c) SEM image of  $\text{g-C}_3\text{N}_4$ @ $\text{Fe}_3\text{O}_4$  NPs (scale bar: 100 nm).



Kizil, N., Kayacı, N., Erbilgin, D. E., Yola, M. L., Yilmaz, E., & Soylak, M. (2025). G-C3N4@Fe3O4 Nanomaterial Synthesis for Magnetic Solid-Phase Extraction and Photocatalytic Removal of Basic Blue 3. *Arabian Journal for Science and Engineering*. <https://doi.org/10.1007/s13369-025-10937-w>

## A PROMISING NEW GENETIC DISCOVERY IN THE TREATMENT OF MARFAN SYNDROME

In a comprehensive bioinformatics study conducted to elucidate the genetic mechanisms associated with Marfan syndrome, important insights were obtained into the regulation of the body's connective tissue structure. Among thousands of genetic elements, a microRNA family known as hsa-miR-181 was identified as playing a critical role in the progression of the disease. These molecules were found to regulate processes that lead to tissue weakness in affected individuals. The findings are expected to provide a foundation for the development of early diagnostic tools and personalized treatment strategies in the future.

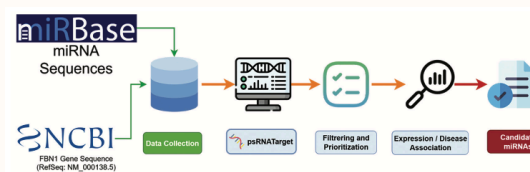


Figure 1. The schema of the study workflow.  
NCBI: National Center for Biotechnology Information

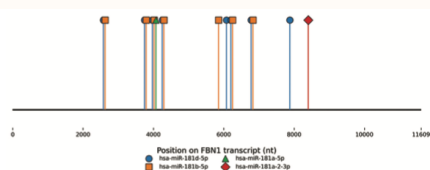


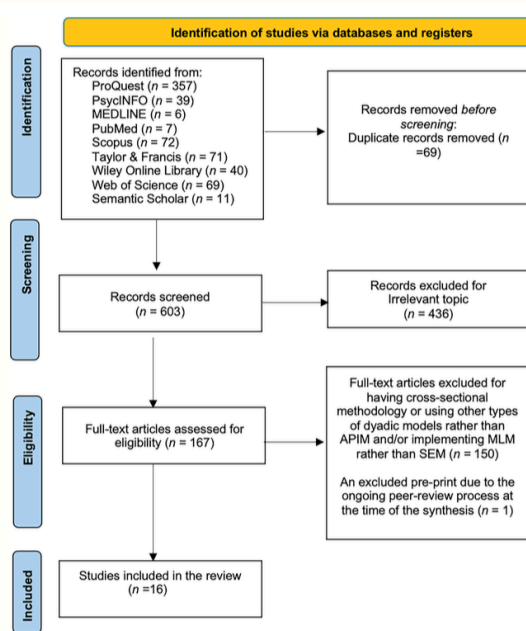
Figure 2. Lollipop plot of miR-181 binding sites on FBN1.

Orhan, M. E., Demirci, Y. M., & Saçar Demirci, M. D. S. (2025). Comprehensive Prediction of FBN1 Targeting miRNAs: A Systems Biology Approach for Marfan Syndrome. *Gazi Medical Journal*, 36(4), 401–406. <https://doi.org/10.12996/gmj.2025.4444>



# UNCERTAINTY AND COMPLEXITY IN RELATIONSHIPS PUT UNDER THE MICROSCOPE

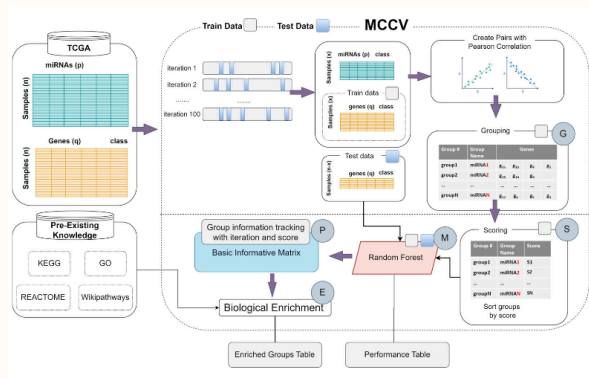
A comprehensive scientific study examining processes of distress and uncertainty in human relationships has been published. Conducted within the framework of Relational Turbulence Theory, the research analyzed how couples influence one another during challenging life periods. Effective communication was identified as the most critical factor in protecting relationships during times of stress. This review, synthesizing sixteen different academic studies, also showed that the facilitative support partners provide to each other positively affects psychological well-being. These findings are expected to contribute to the development of healthier societal structures.



Lağap, A. C., & Güngör Çulha, D. (2025). Looking for Stability in Chaos: A Scoping Review of Relational Turbulence Theory From a Dyadic Perspective. *Journal of Family Theory and Review*. <https://doi.org/10.1111/jftr.70033>

# THE POWER OF ARTIFICIAL INTELLIGENCE AND BIOLOGICAL KNOWLEDGE IN CANCER DIAGNOSIS

To better understand the molecular mechanisms of complex diseases such as cancer, researchers at Abdullah Gül University have developed an innovative software tool called G-S-M-E. Using this new approach, thousands of genetic data points (miRNA and mRNA) were analyzed by integrating artificial intelligence algorithms with prior biological knowledge. The developed system successfully distinguished disease and control groups across several cancer types, particularly breast cancer, with a high accuracy rate of 98%. By revealing hidden interaction patterns within cells, the study provided critical new biological insights that are expected to support early diagnosis and personalized treatment strategies.



M., Bakir-Güngör, B., & Yousef, M. (2025). G-S-M-E: A Prior Biological Knowledge-Based Pattern Detection and Enrichment Framework for Multi-Omics Data Integration. *Applied Sciences (Switzerland)*, 15(23), Article 12669. <https://doi.org/10.3390/app152312669>



# DISASTER RESILIENCE ASSESSED IN THE MIDDLE EAST AND NORTH AFRICA

In this study, the level of preparedness of Middle East and North Africa countries against natural disasters was examined. For this purpose, a Disaster Resilience Index was developed, incorporating economic, social, infrastructural, and environmental indicators. When the results were compared with disaster-related losses, countries with strong governance structures and robust infrastructure were found to be more resilient. The findings are intended to guide policies aimed at reducing disaster risks.

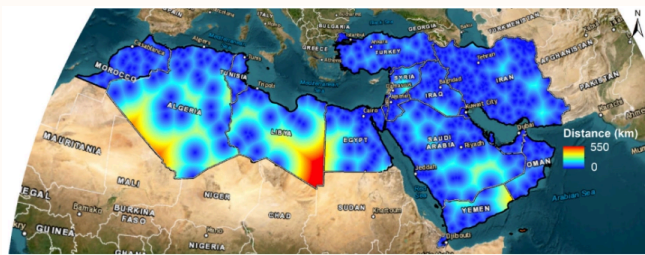


Fig. 1. Euclidean distance from airports for each MENA country (generated using ArcMap 10.8.1<sup>®</sup>).



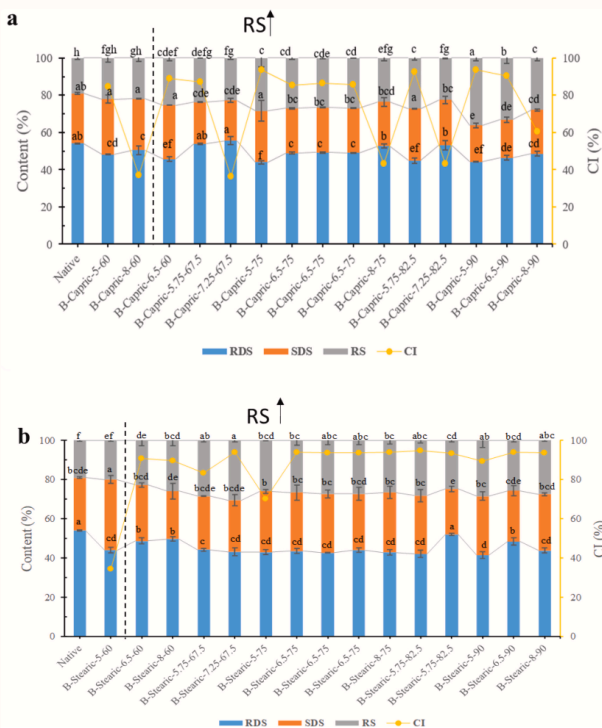
Fig. 5. Disaster resilience index of MENA countries (generated using ArcMap 10.8.1<sup>®</sup>).



Demir, A., Dinçer, A. E., & Dincer, N. N. (2025). Measuring Disaster Resilience in MENA Countries and Its Impact on Disaster Losses. *Scientific Reports*, 15(1), Article 43357. <https://doi.org/10.1038/s41598-025-27844-7>

## HEALTHIER FOODS MADE POSSIBLE WITH BUCKWHEAT STARCH

A study was conducted on introducing buckwheat starch to the food industry through a new method developed by combining it with specific fatty acids. The research showed that this approach reduced the digestibility of the starch while increasing the amount of “resistant starch.” As a result, it is aimed to produce foods that raise blood sugar more slowly and support digestive health. This innovative study is expected to contribute to the development of functional food products, particularly for individuals with celiac disease and for those seeking healthier nutrition options.

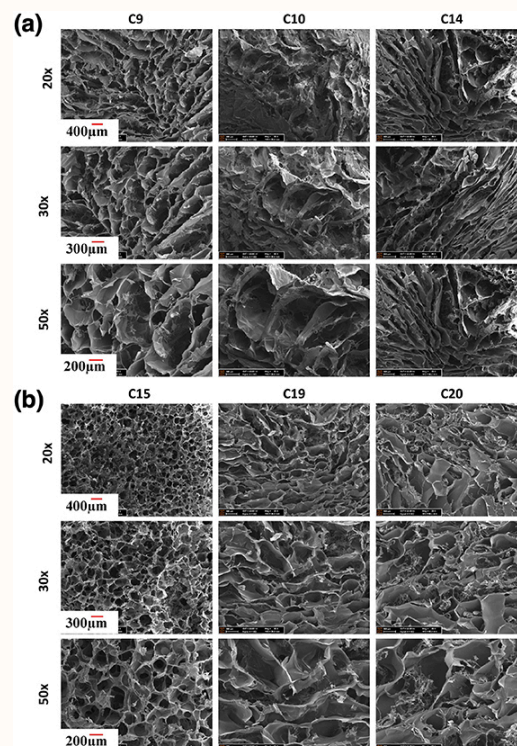


Oskaybaş-Emlek, B., Özbey, A., Aydemir, L. Y., & Kahraman, K. (2025). Development and Characterization of Starch-Fatty Acid Complexes Produced With Buckwheat Starch and Capric/Stearic Acid Using Different Reaction Conditions. *International Journal of Biological Macromolecules*, 334, Article 148868. <https://doi.org/10.1016/j.ijbiomac.2025.148868>



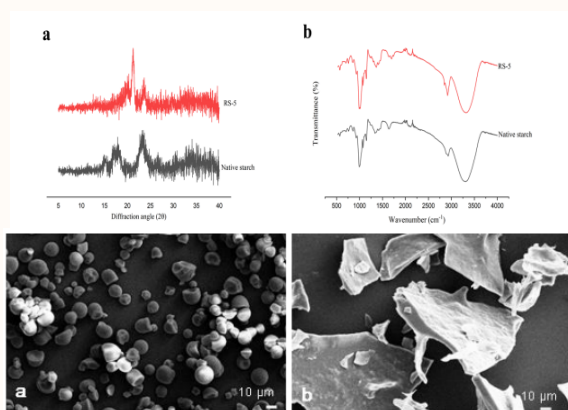
## A NEW PLANT-BASED HEMOSTATIC MATERIAL DEVELOPED

Scientists have developed a specialized sponge-like material capable of rapidly stopping bleeding. Produced using an extract from a natural plant known as mullein, this material was designed for emergency intervention in severe injuries. Tests showed that the sponge quickly promotes blood clotting and prevents infection by eliminating microbes. This plant-based system, which does not damage body cells, is intended to be life-saving, particularly during the critical period before reaching a hospital. Found to be safe and effective, the method is considered an important advancement in modern medicine.



Uzuner, H., Yuruk, A., & Işioğlu, İ. A. (2025). A potential hemostatic chitosan/gelatin cryogel impregnated with *Verbascum thapsus* leaf extract for noncompressible hemorrhage management. *Biomedical Materials*, 20(6). <https://doi.org/10.1088/1748-605X/ae19b7>

## A NEW ERA IN HEALTHY SNACKS: HARD-TO-DIGEST STARCH COOKIES



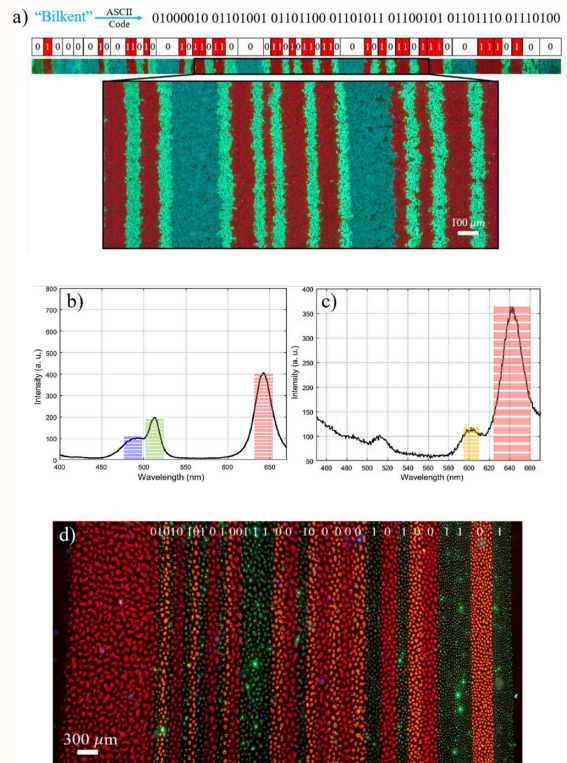
In a study aimed at developing healthier foods, “resistant starch” was produced by combining tapioca starch with a specific fatty acid. This type of starch was blended with wheat flour at certain ratios and used in cookie production. The resulting cookies were observed to have a softer texture compared to standard products and a more balanced potential to raise blood sugar levels. Successfully tested under laboratory conditions, this method is expected to offer a new option for the production of healthy snacks.

Oskaybaş-Emlek, B., Özbey, A., & Kahraman, K. (2025). Development of resistant starch type-5 and its utilization in cookie-preparation. *Carpathian Journal of Food Science and Technology*, 17(3), 30–41. <https://doi.org/10.34302/2025.17.3.3>



# NANO-TECHNOLOGY “FINGERPRINT” PROTECTION AGAINST COUNTERFEIT PRODUCTS

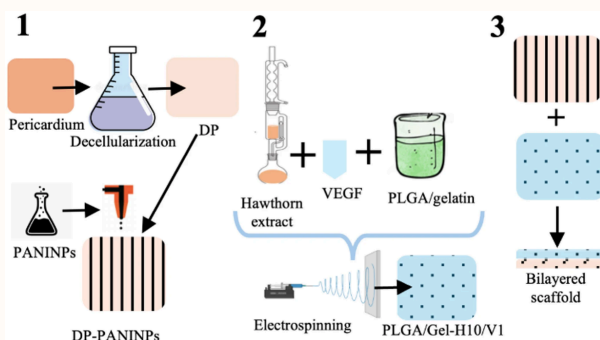
To combat the global problem of counterfeiting, a new nano-label technology that is impossible to replicate has been developed. These labels are produced using self-assembling crystals formed at liquid interfaces, giving each product a unique and random security pattern—similar to a human fingerprint. The system can be verified using smartphone cameras and has successfully passed durability tests under high temperature and humidity conditions. This low-cost advanced technology is expected to be used especially for enhancing the security of electronic chips.



Haddadifam, T., Shabani, F., Kalay, M. U., Khaligh, A., Mutlugün, E., Onses, M. S., & Demir, H. V. (2025). Ultra-durable information-encoded anti-counterfeiting self-assembled nanocrystal labels. *Advanced Optical Materials*. Advance online publication. <https://doi.org/10.1002/adom.202502884>

## NEW HOPE FOR HEART DISEASE: ADVANCED TECHNOLOGY CARDIAC PATCH DEVELOPED

A new “bilayered cardiac patch” has been developed to repair tissue damage caused by heart attacks. The patch was designed using bovine pericardium and conductive particles to mimic the heart’s natural structure. Enriched with plant extracts and proteins that support blood vessel formation, the design was shown to be fully compatible with blood and to allow cell growth. Laboratory tests demonstrated promising results. The study suggests that this technology may become a surgical treatment option for heart failure in the future.

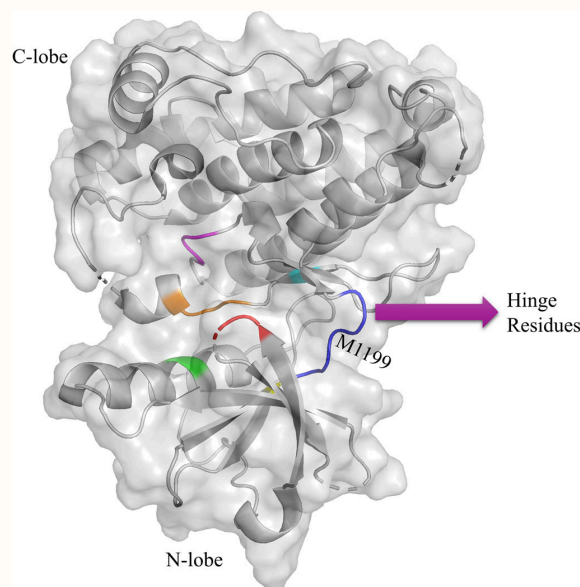


Yuruk, A., Düzler, A., Dinçer, S. D., & Işoğlu, İ. A. (2025). Engineering a bilayered scaffold as a potential cardiac patch: From scaffold design to in vitro assessment. *Journal of Bionic Engineering*. Advance online publication. <https://doi.org/10.1007/s42235-025-00803-8>



## NEW COMPOUNDS DESIGNED FOR CANCER DRUG DEVELOPMENT

Researchers have designed new alpha-carboline derivative compounds for use in cancer treatment. In the study, more than two hundred molecules targeting the anaplastic lymphoma kinase protein were tested in silico. Using molecular modeling and simulation techniques, the most effective candidates were identified. Two of the developed compounds were predicted to be effective against cancer cells that show resistance to existing drugs. The designed molecules are being considered as potential treatment options, particularly for anaplastic lymphoma kinase-positive cancers such as lung cancer and neuroblastoma. The results provide a basis for advanced laboratory and clinical studies.



Sarı, C., & Akçok, İ. (2025). Toward the design of new  $\alpha$ -carboline derivatives against anaplastic lymphoma kinase (ALK): A comprehensive in silico approach. *ChemistrySelect*, 10(44), e00850. <https://doi.org/10.1002/slct.202500850>

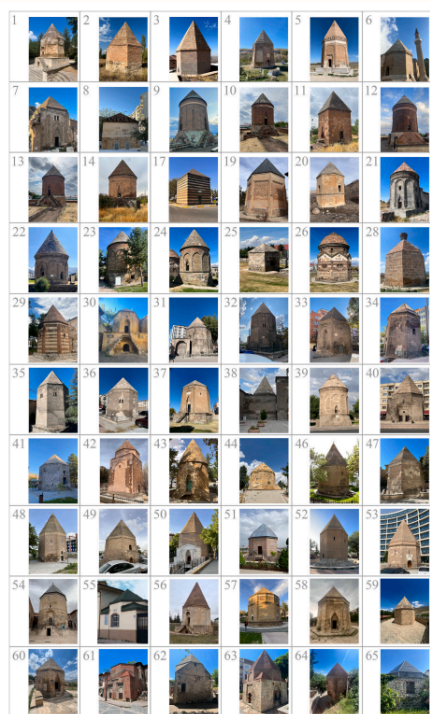


Fig. 6. Photographs of kumbets from the data collection phase for Dataset 2. (Source: Authors).

## DIGITAL DOCUMENTATION OF ANATOLIAN SELJUK TOMBS COMPLETED

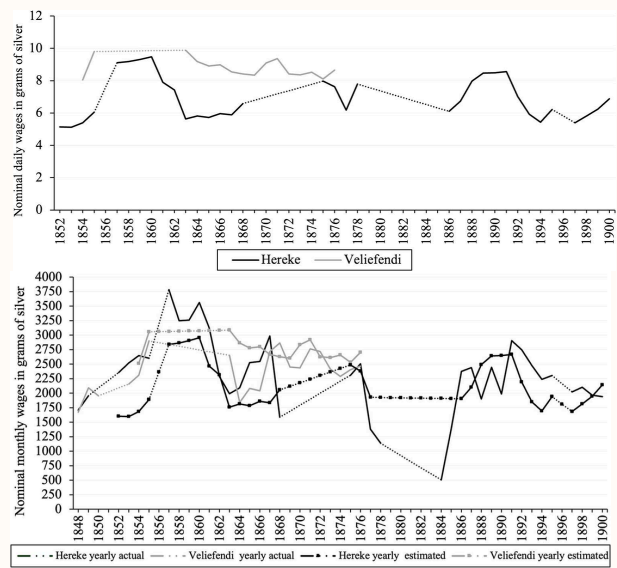
Scientists have digitally documented 60 tomb structures (kumbets) from the Anatolian Seljuk period. Located across 18 provinces in Türkiye, these monumental mausoleums were recorded in three dimensions using laser scanning and photogrammetry techniques. The collected data were compared with previously published drawings, revealing geometric discrepancies. Analyses showed notable measurement differences, particularly in the conical roofs and drum sections. The study produced a reliable dataset reflecting the current condition of the tombs. This digital archive offers an important resource for restoration projects and architectural research.

Güzelci, O. Z., & Türel, A. (2025). A comparative study of existing and current on-site documentation of Anatolian Seljuk kumbets. *Digital Applications in Archaeology and Cultural Heritage*, 39, e00472. <https://doi.org/10.1016/j.daach.2025.e00472>



# WAGES IN OTTOMAN TEXTILE FACTORIES EXAMINED

A new study investigated the income conditions of workers employed in Ottoman state textile factories during the 19th century. The analysis showed that wages paid in factories such as Hereke and Veliefendi lagged behind those in other sectors as well as comparable factories in Europe. It was determined that low-cost policies implemented to compete with cheap imported goods led to stagnant worker wages. In addition, workers' limited mobility and state-imposed fixed wage regulations were identified as contributing factors to this situation.



Güven, T. (2025). Stagnant wages in the Ottoman State textile factories in the nineteenth century: Comparison with European wages. *European Review of Economic History*, 29(4), 558–578. <https://doi.org/10.1093/ereh/haef005>

# DIETARY CARBOHYDRATE RATIO THREATENS GUT HEALTH

In a new scientific study, the effects of staple foods in the diet on gut health were examined. It was found that diets high in carbohydrates significantly increased signs of inflammation, particularly in the large intestine. Experiments conducted on mice showed that not only Western-style diets, but also foods rich in sugar and starch, negatively affected the body's defense system. The protein structures that protect the intestinal barrier were shown to change directly depending on nutrient content. The study emphasized that maintaining a balance between carbohydrates and dietary fiber is essential for a healthy life.

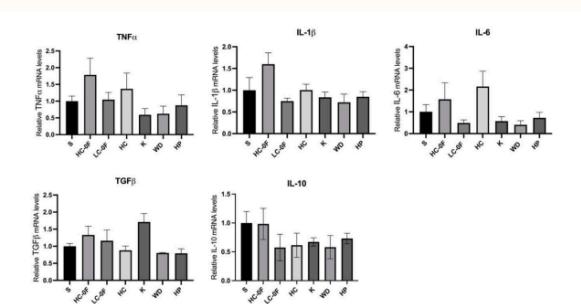


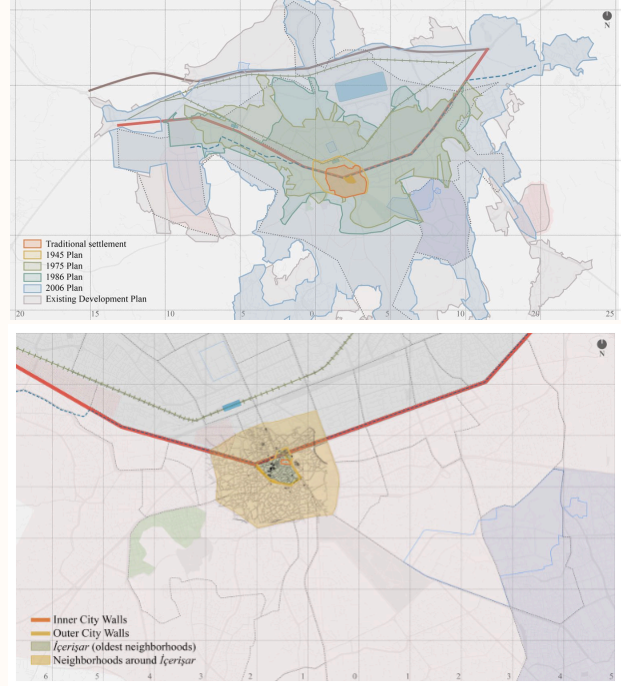
Figure 1. Gene expressions of pro- and anti-inflammatory cytokines in small intestine for different diets (S, HC-OF, LC-OF, HC, K, WD, and HP). Data are mean ± SEM (n ≥ 3), analysed via One-way ANOVA with Tukey's HSD.

Ulutaş, M. S., & Cebeci, A. (2025). Macronutrients in diets differentially affect gastrointestinal cytokine and tight junction protein levels. *International Food Research Journal*, 32(1), 242–251. <https://doi.org/10.47836/ifrj.32.1.18>



## KAYSERİ'S INDIGENOUS IDENTITY EXAMINED

Researchers examined Kayseri's deep-rooted local identity known as the "yilli" concept. Conducted through ethnographic fieldwork and spatial analyses, the study revealed how the yilli community preserves its traditional social boundaries during the urban transformation process. The findings showed that the community does not resist change; instead, it reinterprets modernization to strengthen status and a sense of belonging. Patterns of spatial relocation and investment were found to reflect underlying economic strategies. Overall, the results indicated that urban transformation in Kayseri is both a material and cultural process, shaped by memory and social hierarchy.



Muş Özmen, N., Asiliskender, B., & Özmen, Z. (2025). Boundaries of belonging: The spatial and social logic of being yilli people in Kayseri. *Space and Culture*. <https://doi.org/10.1177/12063312251392383>

## DATA IMPACT IN URBAN PRACTICE: INSIGHTS OF KAYSERİ TRAM NETWORK

A thesis investigates how data analysis tools can enhance urban quality through the KayseRay light rail system in Kayseri. The research aims to develop a design framework at the human scale using GIS, CFD simulations, and data visualizations. It highlights how data-driven approaches can address inefficiencies in pedestrian flow and accessibility issues, enhancing urban vitality.



Aysu ŞENBAŞ

Graduate School of Engineering and Sciences / Architecture  
MSc. Thesis (2025)

## DENTIFYING POTENTIAL TAXONOMIC BIOMARKERS OF GASTROINTESTINAL CANCERS FROM HUMAN MICROBIOTA USING THE GROUPING-SCORING-MODELING (G-S-M) AND TRADITIONAL FEATURE SELECTION APPROACHES

A study reveals analyzing microbial abundance in tissue and blood samples could predict gastrointestinal cancer, marking a novel approach. Utilizing the TCMA dataset from the Cancer Genome Atlas, researchers compared traditional algorithms with the MicrobiomeGSM model for accuracy in cancer prediction. This method may lead to early detection and personalized treatment, potentially transforming cancer diagnosis and management by identifying common microbial biomarkers for various GI cancers.



Beyza ÇANAKCIMAKSUTOĞLU

Graduate School of Engineering and Sciences / Bioengineering  
MSc. Thesis (2025)

## **DEVELOPMENT OF A SUSTAINABLE BIOFUNGICIDE AGAINST PLANT PATHOGENS USING TRICHODERMA HARZIANUM CULTIVATED ON AGRO INDUSTRIAL WASTE**

This study highlights *Trichoderma harzianum* as an eco-friendly biocontrol agent against major phytopathogens, showing up to 96.76% inhibition, especially on *Colletotrichum coccodes*. It produces indole-3-acetic acid and siderophores, promoting plant growth. Cultivation on apple pomace supports sustainability, circular economy, and waste valorization. Findings emphasize its dual role in crop protection and growth promotion, offering a safe alternative to chemical fungicides in sustainable agriculture.



Didem BAYRAKTAROĞLU SERİN  
Graduate School of Engineering and Sciences / Bioengineering  
MSc. Thesis (2025)

## **AI-ASSISTED OPTIMIZATION OF SHOT PEENING PROCESS AND INVESTIGATION OF THE EFFECTS OF SECONDARY PROCESSES ON HYDROGEN EMBRITTLEMENT RESISTANCE AND MECHANICAL PERFORMANCE OF SLM MANUFACTURED ALSI10MG ALLOY**

This thesis explores shot peening optimization and hydrogen embrittlement mitigation in AlSi10Mg alloys made via Selective Laser Melting (SLM). It reviews optimization techniques and additive manufacturing challenges, focusing on hydrogen embrittlement in aviation components. Using AI-based methods validated by Almen tests, it demonstrates improvements in fatigue resistance and proposes advanced strategies for embrittlement mitigation. The study highlights the importance of enhanced material reliability and suggests further research into AI-assisted manufacturing for aerospace sustainability.



Kadir Kaan KARAVELİ  
Graduate School of Engineering and Sciences / Mechanical Engineering  
Ph.D. (2025)