

Research Bulletin

February 2026

Publications

GENOMIC DATA CAN BE SHARED SECURELY AND TRANSPARENTLY WITH GENSHARE

A new platform called GenShare has been developed to enable the secure sharing of genomic data. By integrating blockchain technology, homomorphic encryption, and secure hardware infrastructure, the system allows data to be analyzed without revealing its content. Within the platform, data owners' rights are protected, access permissions are strictly controlled, and all transactions are transparently recorded. The analyses required by researchers are carried out through secure computing nodes. The system's performance was tested under different workloads. It was stated that the study could contribute particularly to secure data sharing in health research.

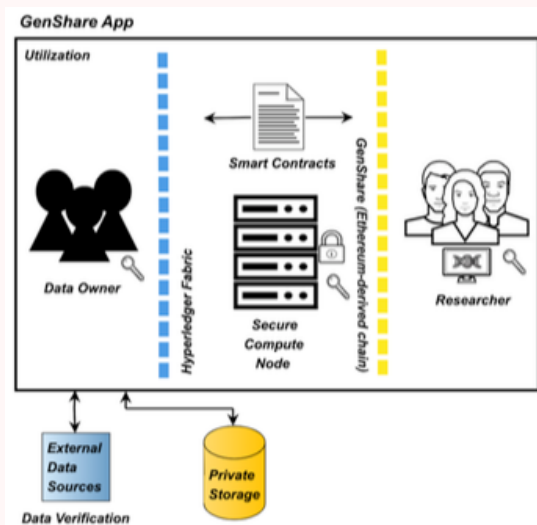


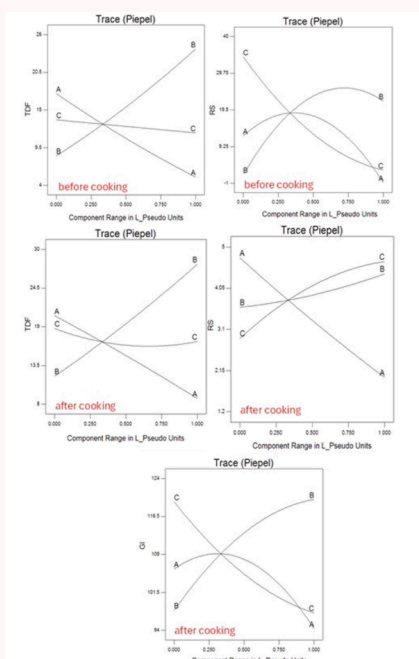
Fig. 3. Overview of the GenShare model.



Dedeturk, B. A., Soran, A., & Bakir-Güngör, B. (2026). GenShare: A Blockchain-Based Genomic Data Sharing Platform. *Distributed Ledger Technologies*, 5(2), Article 14. <https://doi.org/10.1145/3743696>

HEALTHIER FOODS POSSIBLE WITH LEGUME-BLENDED FLOURS

In this study, the nutritional values of special flour blends made from wheat, kidney bean, and lentil flours were examined. Significant increases in fiber content and resistant starch levels were observed after the cooking process. Kidney bean flour was found to have the highest fiber content. It was stated that such blends may contribute to the prevention of health problems such as obesity and diabetes. The findings are expected to guide the development of healthier food formulations.

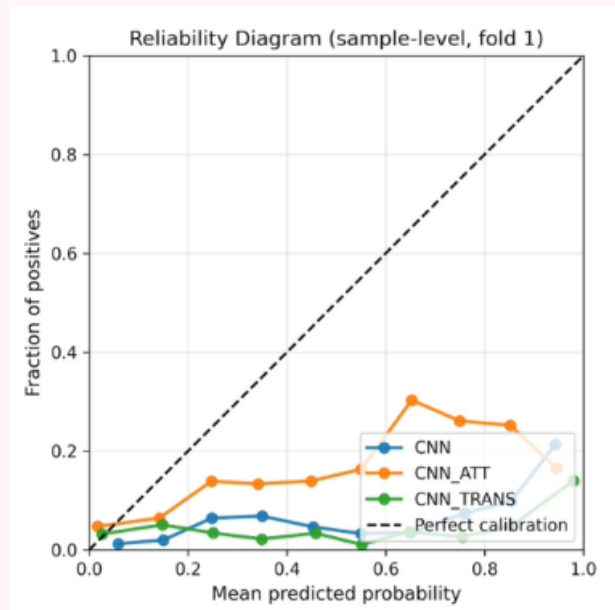


Kahraman, K., Yüksel, F., & Karaman, S. (2026). Effects of Gelatinization Process on Some Physicochemical Parameters, Pasting Characteristics and Some Nutritional Properties of Pulsed Based Flour Blends. *European Food Research and Technology*, 252(3), Article 130. <https://doi.org/10.1007/s00217-025-04999-1>



A NEW STEP IN SLEEP APNEA DIAGNOSIS WITH CONTACTLESS AUDIO RECORDING

A camera-based and contactless method was developed for the diagnosis of sleep apnea, which is defined as the cessation of breathing during sleep. In this study, audio recordings collected without physical contact with the patient were analyzed using artificial intelligence models. Tests conducted on thirty-two adults measured the performance and reliability of the developed deep learning models. This innovative approach demonstrated that sleep apnea classification can be performed using real-world data outside clinical settings.



Aygün Çakıroğlu, M., Kizilkaya Aydoğan, E., Bolattürk, Ö. F., Aydoğan, S., Ismailoğulları, S., & Delice, Y. (2026). Non-Contact Acoustic Screening for Sleep Apnea: A Subject-Aware Deep Learning Approach. *Sleep and Breathing*, 30(1), Article 36. <https://doi.org/10.1007/s11325-026-03594-2>

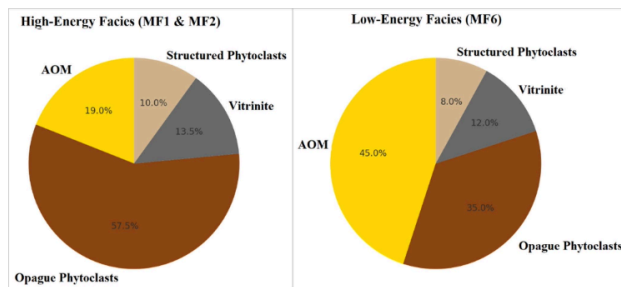
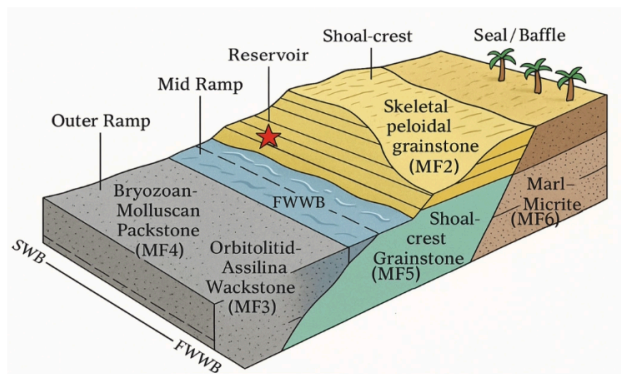


Fig. 19 Pie-chart comparison illustrating differences in AOM, opaque phytoclasts, structured phytoclasts, and vitrinite content between high-energy facies (MF1-MF2) and restricted lagoonal facies (MF6)



A NEW MAP DRAWN FOR THE EXPLORATION OF ENERGY RESOURCES IN PAKISTAN

A comprehensive study was conducted to determine the energy potential of the Sakesar limestone formation in Pakistan. Within the scope of this research, the historical formation processes of the rocks in the region and the organic materials they contain were analyzed in detail. Laboratory tests revealed that some rock types have the capacity to generate oil and natural gas. It was stated that the geological structure of the region provides significant clues regarding energy resources.

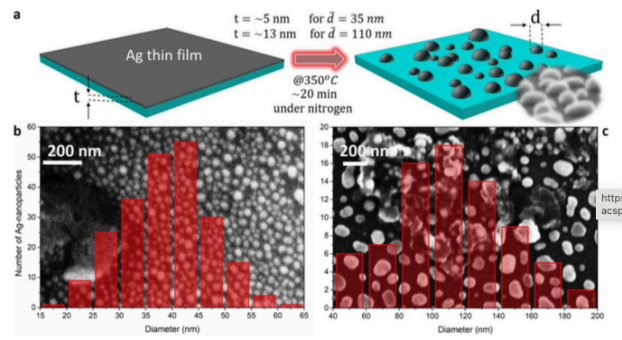
Shah, S. B. A., & Shah, S. H. A. (2026). Depositional Model, Cyclicity, and Hydrocarbon Potential of the Eocene Sakesar Carbonate Ramp, Salt Range, Pakistan. *Carbonates and Evaporites*, 41(1), Article 20. <https://doi.org/10.1007/s13146-026-01224-2>



A NEW ERA IN LIGHT TECHNOLOGY: QUANTUM LIGHT SOURCES ENHANCED

A new study was conducted on light emitters that are of great importance for future quantum technologies. Using a special material called hexagonal boron nitride (hBN), light sources capable of stable operation at room temperature were developed.

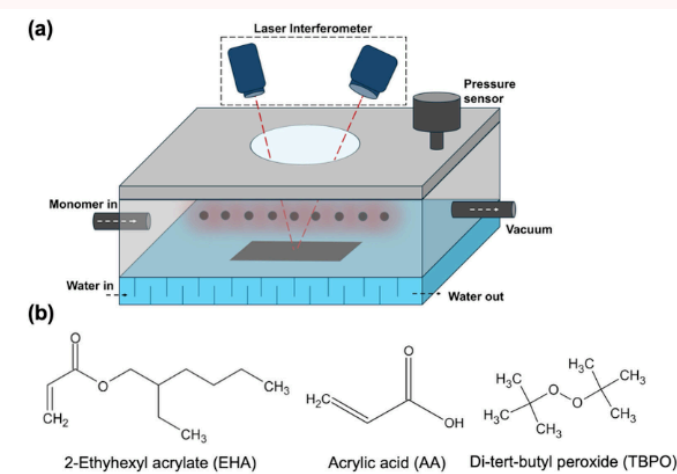
In this study, a low-cost and scalable fabrication method was followed to increase light intensity. Thanks to the newly developed architecture, the light emission intensity was observed to increase by up to 100 times. With this method, high efficiency was achieved without the need for precise placement of materials.



Genc, S., Yücel, O., Ağlarci, F., Rodriguez-Fernández, C., Yilmaz, A., Caglayan, H., Ateş, S., & Bek, A. (2026). Disorder-Engineered Hybrid Plasmonic Cavities for Emission Control of Defects in hBN. *ACS Photonics*, 13(4), 937–948. <https://doi.org/10.1021/acsp Photonics.5c02063>

ADHESION PERFORMANCE IMPROVED IN PARTS PRODUCED WITH 3D PRINTERS

A new study was conducted on the adhesion strength of thin adhesive films applied to plastic parts produced using 3D printing technology. The research determined that the printing orientation of the parts directly affects adhesion performance. Test results showed that surfaces printed at a specific angle exhibited the highest adhesion strength, while at some angles this strength decreased significantly. It was demonstrated that adhesion quality can be controlled solely through production settings, without requiring any chemical treatment.

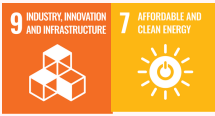
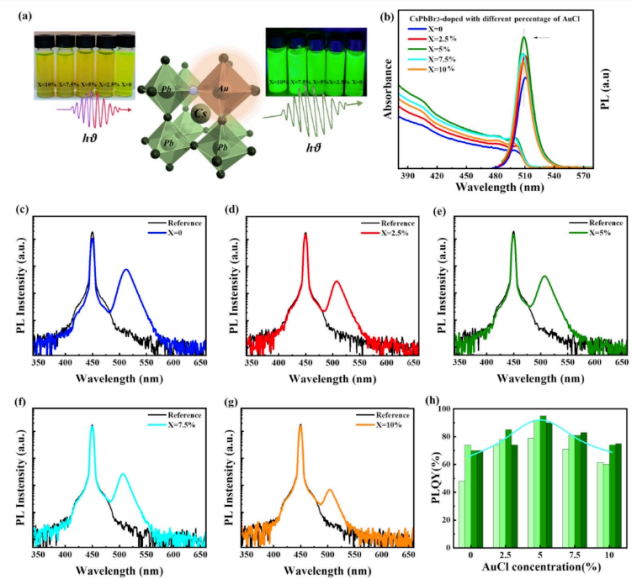


Güneş, A., Yılmaz, K., Gürsoy, M., & Karaman, M. (2026). Raster Orientation Effects on the Adhesion of iCVD-Deposited PSA Thin Films on FDM-Printed PLA. *Polymers*, 18(3), Article 371. <https://doi.org/10.3390/polym18030371>



THE EFFICIENCY AND STABILITY OF QUANTUM DOTS WERE ENHANCED WITH GOLD CHLORIDE

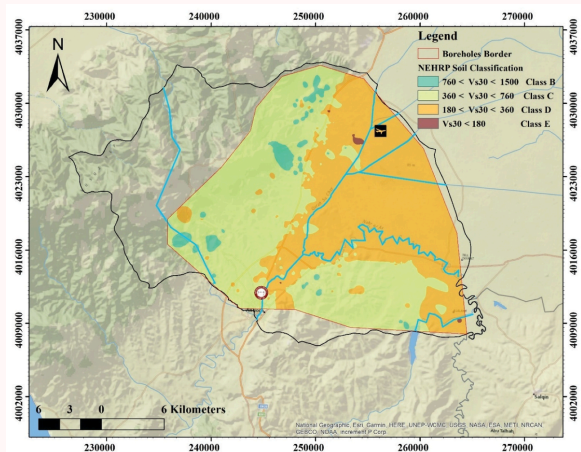
An important study was conducted on “quantum dots,” which have great potential in future imaging and energy technologies. In this study, gold chloride doping was used to improve the performance of cesium lead bromide crystals. Experimental results showed that the addition of gold chloride significantly increased the light emission capacity (brightness) of the material and improved its resistance to environmental effects. It was determined that the best results were achieved with a 5% doping ratio.



Khorasani, A., & Mutlugün, E. (2026). Enhanced Photoluminescence and Stability of CsPbBr₃ Perovskite Nanocrystals Through AuCl Doping. *Journal of Materials Science: Materials in Electronics*, 37(4), Article 333. <https://doi.org/10.1007/s10854-026-16622-4>

THE SEISMIC SOIL CLASS OF ANTAKYA WAS DETERMINED THROUGH A COMPREHENSIVE ANALYSIS

The seismic soil characteristics of Antakya were extensively investigated following the February 2023 earthquakes. Soil classification was carried out using data obtained from 630 boreholes and 977 different locations. According to the NEHRP provisions and the Turkish Seismic Code, approximately 51% of the area was classified as Class C soil and 44% as Class D soil. A new regional correlation equation was also developed, and it was determined that this equation produced results with accuracy comparable to existing methods.



Alosman, S. O., Akin, M. K., & Çabalar, A. F. (2026). Seismic site classification via V S₃₀ and SPT-N values in Antakya City, Türkiye. *Journal of Earthquake Engineering*. <https://doi.org/10.1080/13632469.2025.2612498>



AN INNOVATIVE METHOD DEVELOPED FOR FAULT DETECTION IN LARGE HYDROELECTRIC GENERATORS

An innovative and practical method that does not require external intervention was developed for the early detection of mechanical faults in large generators used in hydroelectric power plants. Computer-aided modeling and an advanced optimization algorithm were combined to analyze current variations in the generators in detail. Without the need for additional sensors or hardware, the electrical characteristics of the machine were accurately estimated using only the existing three-phase current measurements. Simulations demonstrated that this non-destructive approach can detect faults before they grow, significantly improving the operational reliability and service life of power generation systems.

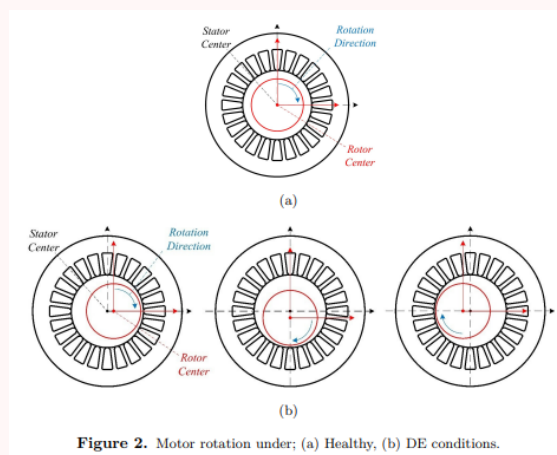
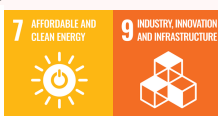


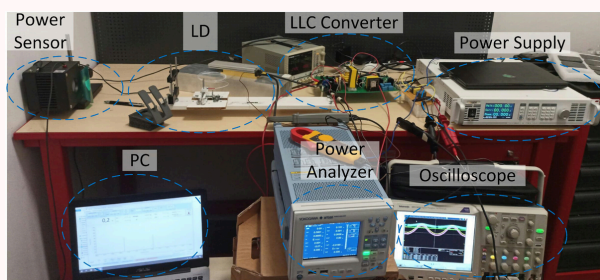
Figure 2. Motor rotation under: (a) Healthy, (b) DE conditions.



Lemeski, A. T., Tekgun, D., Keysan, O., Leblebicioğlu, K., & Göl, M. (2026). Noninvasive condition monitoring for eccentricity fault detection in large hydro generators. *Turkish Journal of Electrical Engineering and Computer Sciences*, 34(1), 67-83. <https://www.scopus.com/pages/publications/105030178990>

NEW DRIVER WAVEFORMS TESTED IN LASER-BASED WIRELESS POWER TRANSFER

The efficiency of high-power laser diodes, which are critical components in laser-based wireless power transfer systems, was analyzed through computer-based simulations. In the study, the performance of a high-efficiency converter driver supplying the laser diodes was tested using three different waveforms. Supported by experiments reflecting real operating conditions, the analysis determined the effects of waveform shape on both driver and laser efficiency. While constant current operation was proven to provide the highest efficiency, the extent to which fluctuations caused by different waveforms led to energy losses in the system was numerically demonstrated.

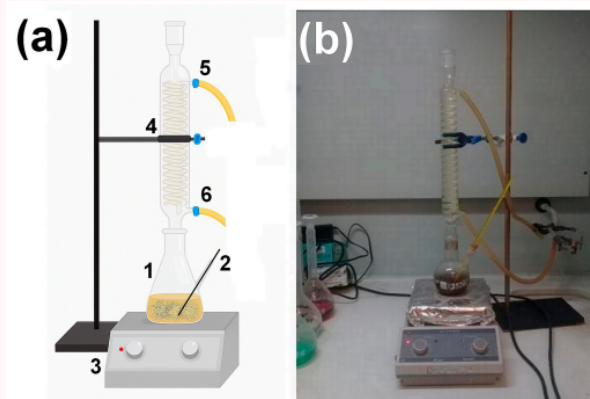


Yigit, H., Rifat Boynueğri, A., & Tekgun, B. (2026). Comparative analysis of modulation shapes on laser diode performance with a high-efficiency LLC resonant converter driver. *International Journal of Circuit Theory and Applications*. <https://doi.org/10.1002/cta.70354>



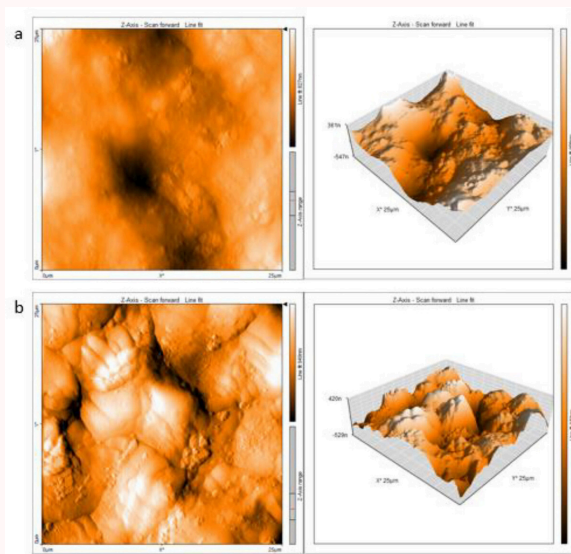
NEW BIOMASS-BASED METHOD DEVELOPED FOR SEPARATING MANGANESE FROM MANGANESE-BEARING IRON ORE

A new solution was investigated for the separation of manganese from manganese-bearing iron ore using nitric acid and different organic substances. In particular, the effects of waste biomass and organic acids on the process were examined in detail. In laboratory tests, it was determined that while iron remained in the solid state, more than ninety percent of the manganese passed into the liquid phase with high efficiency. It was found that this energy-efficient process, developed for manganese recovery from complex-structured ores, significantly reduced chemical costs and iron contamination and offered an environmentally friendly option.



Top, S., Altiner, M., Vapur, H., Kursunoglu, S., & Stopić, S. R. (2026). A novel biomass-derived reductant for nitric acid dissolution of manganiferous iron ore: Comparative assessment of organic reductants. *Minerals*, 16(1), Article 47. <https://doi.org/10.3390/min16010047>

OPTIMIZATION OF THE EDIBLE FILM PRODUCTION PROCESS FROM BUCKWHEAT STARCH



The production parameters of an edible film were optimized using buckwheat starch and a myristic acid complex. The effects of glycerol concentration, pH, and temperature on the mechanical properties of the film were investigated using the central composite design method. It was determined that glycerol concentration and temperature significantly affected tensile strength. Compared to the control film, the film produced under optimized conditions exhibited lower water solubility (34.3%) and water vapor permeability, along with a higher opacity value.

Koca, E., Oskaybaş-Emlek, B., Kahraman, K., Özbey, A., & Aydemir, L. Y. (2026). Process optimization of buckwheat starch myristic acid complex film. *Starch - Stärke*, 78(2), Article e70167. <https://doi.org/10.1002/star.70167>



IN SILICO DISCOVERY OF DUAL HSP90 INHIBITORS TARGETING HDAC6 AND ALK FOR CANCER THERAPY

Research highlights the critical roles of Hsp90, HDAC6, and ALK in cancer, suggesting that their combined inhibition could significantly halt cancer progression. A study employing in-silico techniques identified ZINC27653366 and CNP0264442.1 as promising inhibitors against these targets, offering new avenues for effective cancer treatments. Why it matters: The discovery of compounds that can simultaneously inhibit key cancer proteins opens up potential for groundbreaking therapies.



Muhsin Samet YÜCEL

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

IDENTIFICATION OF NOVEL CANDIDATES AGAINST THE TYROSINE KINASE DOMAIN OF ALK BY COMPREHENSIVE IN SILICO APPROACHES

A new study has discovered innovative compounds targeting the ALK tyrosine kinase for cancers resistant to ALK inhibitors, potentially paving the way for treatments effective against resistant cancer types. Why it matters: Resistance to current treatments necessitates the exploration of new solutions. This study holds promise for ALK-positive cancers. By the numbers: Three new compounds, 208,209, and CNP106316.1, stand out with high binding energies, potentially heralding a new era in cancer treatment.



Ceyhun SARI

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

HOUSING CULTURE OF YİLLİ IN KAYSERİ: A HABITUS-BASED STUDY

The study investigates how housing choices of the local community in Kayseri affect urban belonging and social identity, portraying homes as beyond physical structures, embodying cultural continuity and social connections. Why it matters: It emphasizes how housing choices and neighborhood ties shape belonging to the “yilli” community. The bottom line: Offers a deep understanding of housing's role in reproducing locality, identity, and urban memory, providing insights into Kayseri's social fabric.



Nihan MUŞ ÖZMEN

Graduate School of Engineering and Sciences / Architecture
Ph.D. (2025)