



SHMYO BÜLTEN



2026-TEMMUZ/AĞUSTOS
2026-JULY/AUGUST



İstanbul Aydın Üniversitesi, Sağlık Hizmetleri Meslek Yüksekokulu
Istanbul Aydın University Vocational School of Health Services



İAÜ Sağlık Hizmetleri Meslek Yüksekokulu e-Bülteni

VOCATIONAL SCHOOL OF HEALTH SERVICES E-BULLETIN

T.C.
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İAÜ Sağlık Hizmetleri Meslek Yüksekokulu e-Bülteni

VOCATIONAL SCHOOL OF HEALTH SERVICES E-BULLETIN

PROGRAMLAR/PROGRAMS

- AĞIZ VE DİŞ SAĞLIĞI /ORAL AND DENTAL HEALTH
- AMELİYATHANE HİZMETLERİ/OPERATING ROOM SERVICES
- ANESTEZİ/ANESTHESIA
- DİŞ PROTEZ TEKNOLOJİSİ/DENTAL PROSTHESIS TECHNOLOGY
- DİYALİZ/DIALYSIS
- ECZANE HİZMETLERİ/PHARMACY SERVICES
- ELEKTRONÖROFİZYOLOJİ/ELECTRONEUROPHYSIOLOGY
- FİZYOTERAPİ/PHYSIOTHERAPY
- İLK VE ACİL YARDIM/FIRST AND EMERGENCY AID
- ODYOMETRİ/AUDIOMETRY
- OPTİSYENLİK/OPTICIANS
- ORTOPEDİK PROTEZ VE ORTEZ/ORTHOPEDIC PROSTHETICS AND ORTHOTICS
- PATOLOJİ LABORATUVAR TEKNİKLERİ/PATHOLOGY LABORATORY TECHNIQUES
- RADYOTERAPİ/RADIOTHERAPY
- SOSYAL HİZMETLER/SOCIAL SERVICES
- TIBBİ DOKÜMANTASYON VE SEKRETERLİK/MEDICAL DOCUMENTATION AND SECRETARIAL
- TIBBİ GÖRÜNTÜLEME TEKNİKLERİ/MEDICAL IMAGING TECHNIQUES
- TIBBİ LABORATUVAR TEKNİKLERİ/MEDICAL LABORATORY TECHNIQUES

Sağlık Hizmetleri Meslek Yüksekokulumuzun MEDEK hazırlıkları tüm hızıyla devam ediyor. Öz değerlendirme raporu hazırlığı süreci Yüksekokul Müdürlüğü tarafından ilgili programların başkanları ve öğretim üyeleri ile birlikte tek tek yapılan toplantılarla değerlendirildi. İlgili program başkanları raporlarının son durumuna ilişkin birer sunum gerçekleştirdi. Bunun yanı sıra kalite ve akreditasyon komisyonu üyeleri hocalarımız hazırlanmış olan öz değerlendirme raporları kontrol etti ve eksiklikleri belirledi. Tüm bu değerlendirmeler ve düzenlemeler sonrasında MEDEK'e sunulan raporlar kabul edilerek değerlendirilmeye alındı.

Preparations for the MEDEK accreditation process at our Vocational School of Health Services are continuing at full speed. The preparation process for the Self-Evaluation Reports was reviewed through individual meetings held by the School Administration with the relevant program heads and faculty members. The respective program heads also delivered presentations on the current status of their reports. In addition, the Self-Evaluation Reports prepared by our faculty members serving on the quality and accreditation commission were reviewed, and areas requiring further improvement were identified. Following all these assessments and adjustments, the reports submitted to MEDEK were accepted and taken under review.



Uluslararası Akademik İlişkiler Komisyonu İlk Toplantısını Gerçekleştirdi

İstanbul Aydın Üniversitesi SHMYO Uluslararası Akademik İlişkiler Komisyonu, uluslararasılaşma çalışmaları kapsamında ilk toplantısını gerçekleştirdi. Toplantıda Erasmus hareketlilikleri, uluslararası proje ve akademik çalışmalar ile uluslararası paydaşlarla iş birliklerinin geliştirilmesi konuları ele alındı. Ayrıca NAFSA bağlantıları kapsamında yürütülebilecek uluslararası iş birlikleri değerlendirildi.

International Academic Relations Commission Holds Its First Meeting

The International Academic Relations Commission of Istanbul Aydın University Vocational School of Health Services held its first meeting as part of its internationalization efforts. The meeting focused on Erasmus mobility opportunities, international projects and academic activities, and the development of collaborations with international partners. Potential international collaborations through NAFSA connections were also discussed.



3+1 Uygulamalı Eğitim Modeli Kapsamında İlk İş Birliği sözleşmesi İmzalandı

İstanbul Aydın Üniversitesi ile OPMAR Optik arasında, 3+1 Uygulamalı Eğitim Modeli kapsamında ilk sözleşme imzalandı. SHMYO Müdürlüğü'nde gerçekleştirilen görüşmede, Opmar Optik Yönetim Kurulu Başkanı Semih Saraçoğlu ve beraberindeki diğer yöneticiler ile birlikte sektör iş birliklerinin öğrencilerin uygulamalı eğitim süreçlerine ve mesleki gelişimlerine sağlayacağı katkılar ele alındı. Sektör temsilcilerinin teorik eğitime yönelik önerileri değerlendirildi.

First Collaboration Signed Under the 3+1 Practical Training Model

The first agreement under the "3+1 Applied Training Model" was signed between Istanbul Aydın University and OPMAR Optik. During the meeting held at the Directorate of the Vocational School of Health Services, Opmar Optik Chairman of the Board Semih Saraçoğlu and accompanying executives discussed the contributions that industry collaborations would make to students' applied training processes and professional development. Suggestions from industry representatives regarding theoretical education were also evaluated.



3+1 Uygulamalı Eğitim Modeli kapsamında pilot program olarak seçilen Optisyenlik ve Eczacılık Hizmetleri Programlarında tüm hazırlıklar tamamlandı. Yeni müfredatları hazırlandı ve Eğitim komisyonunca da onaylandı. Yeni uygulamalı eğitim modelinin en önemli bileşenlerinden olan sektör işbirlikleri konusunda önemli adımlar atıldı. Optisyenlik programında Türkiye'nin gözlük devleri olan ATASUN Optik, OPMAR Optik, GÖZ GRUP ve DÜNYA GÖZ Optik ile Eczacılık Hizmetleri Programında da ACIBADEM Hastaneler Grubu ile sözleşme imzalandı. Yapılan bu sektör işbirliklerinin programlarımızın uygulamalı eğitimlerine, okulumuzun görünürlüğüne ve mezuniyet sonrası öğrenci istihdamına büyük katkı sağlayacağını düşünmekteyiz.

All preparations have been completed for the Opticianry and Pharmacy Services programs, which were selected as pilot programs under the 3+1 Applied Training Model. New curricula have been prepared and approved by the Education Commission.

Significant strides have been made regarding industry collaborations, a key component of the new applied training model. Agreements were signed with Turkey's eyewear giants—ATASUN Optik, OPMAR Optik, GÖZ GROUP, and DÜNYA GÖZ Optik—for our Opticianry program, and with the ACIBADEM Hospitals Group for our Pharmacy Services program.

We believe that these industry collaborations will make a significant contribution to the practical training within our programs, the visibility of our school, and post-graduation student employment.



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SHMYO Etkinlik

VSHS Event

Optisyenlik Programımız, 10 Temmuz 2026 tarihinde, Cadi Ayyad Üniversitesinden Dr. Ait El Haj Dris ve İstanbul Sabahattin Zaim Üniversitesinden Dr. Mustafa Fadili'nin teklifi üzerine uluslararası iş birliğinin geliştirilmesi amacıyla bir toplantı gerçekleştirdi. Toplantı sonrasında, Optisyenlik Program Başkanı Doç Dr. Ayşe Karadeniz Yıldırım ve laboratuvar sorumlumuz Damla Gültekin eşliğinde, Optisyenlik Laboratuvarı misafirlerimize tanıtıldı. İki üniversite arasında uluslararası iş birliğinin geliştirilmesine yönelik yapılabilecek çalışmalar ele alındı ve iletişim bilgileri paylaşıldı.

On July 10, 2026, our Opticianry Program held a meeting to explore opportunities for developing international collaboration, following an invitation from Dr. Ait El Haj Dris from Cadi Ayyad University and Dr. Mustafa Fadili from Istanbul Sabahattin Zaim University. Following the meeting, our Opticianry Laboratory was introduced to the guests by Associate Professor Dr. Ayşe Karadeniz Yıldırım, Head of the Opticianry Program, and Damla Gültekin, our laboratory coordinator. Potential initiatives to strengthen international collaboration between the two universities were discussed, and contact information was exchanged.



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SHMYO Etkinlik

VSHS Event

İstanbul Aydın Üniversitesi Rektörlüğü tarafından akademisyenlerin araştırma projeleri hazırlama ve yürütme yetkinliklerini geliştirmek amacıyla düzenlenen “Akademisyenler İçin Araştırma Projesi Hazırlama ve Uygulama Stratejileri Eğitimi” 27-28 Ağustos 2026 tarihlerinde gerçekleştirildi. İki gün süren programda; proje fikrinin geliştirilmesi, başvuru dosyasının hazırlanması, araştırma planlaması ve proje yönetimi konuları ele alındı. Farklı üniversitelerden akademisyenlerin eğitmen olarak görev aldığı eğitime, Tıbbi Laboratuvar Teknikleri Programı’ndan Dr. Öğr. Üyesi Ece Özdemir Babavatan katıldı. Eğitim kapsamında edinilen bilgi ve deneyimlerin araştırma ve proje geliştirme çalışmalarına katkı sağlaması hedeflenmektedir.

The “Research Project Preparation and Implementation Strategies Training for Academicians,” organized by the Rectorate of Istanbul Aydın University (IAU) to enhance academics’ competencies in preparing and conducting research projects, was held on August 27–28, 2026. The two-day program covered topics including developing project ideas, preparing application documents, research planning, and project management. Assistant Professor Dr. Ece Özdemir Babavatan from the Medical Laboratory Techniques Program participated in the training, which brought together academics from different universities as trainers. The knowledge and experience gained through the training are expected to contribute to ongoing research and project development activities.

**İSTANBUL AYDIN
ÜNİVERSİTESİ**

1/2

**AKADEMİSYENLER İÇİN
ARAŞTIRMA PROJESİ HAZIRLAMA
VE UYGULAMA STRATEJİLERİ EĞİTİMİ**

Prof. Dr. Füsün TERZİOĞLU
IAU Rektör Yardımcısı

Prof. Dr. Muhammed KURULAY
İstanbul Teknik Üniversitesi
Öğretim Üyesi

Prof. Dr. Mustafa BÖYÜKATA
Yusufi Bloklu Üniversitesi
Öğretim Üyesi

Prof. Dr. Enes DERTLİ
İstanbul Teknik Üniversitesi
Öğretim Üyesi

Doç. Dr. Şerif ESENDEMİR
Yıldız Teknik Üniversitesi
Öğretim Üyesi

Dr. Öğr. Üyesi Utku Balut ŞİMSEK
IAU Teknoloji Transfer Ofisi
TEKMER Müdürü

27-28 Ağustos 2026
09.00-17.30

T BLOK TURKUAZ SALONU



2026-TEMMUZ/AĞUSTOS
2026-JULY/AUGUST

SHMYO Etkinlik
VSHS Event

Tıbbi Laboratuvar Teknikleri Programından Araştırma Projelerine Katkı



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SHMYO Akademik

VSHS Academic

İlk ve Acil Yardım Programı'ndan Öğr. Gör. Şeyma Karabulut Aluçdibi ve Öğr. Gör. Tuğçe Bilge Yıldırım, mesleki bilgi ve deneyimlerini güncel tutmak ve öğrencilerine daha nitelikli bir eğitim sunmak amacıyla, Hacettepeliler Akademi tarafından 24, 26 ve 28 Ağustos 2026 tarihlerinde gerçekleştirilen 7,5 saatlik "Paramedik ve ATT Vaka Sınıfı (Paramedic and EMT Case Class)" eğitim programına katıldı. Eğitim kapsamında edinilen bilgi ve deneyimlerin, İlk ve Acil Yardım Programı öğrencilerinin eğitim süreçlerine aktarılması hedeflendi. Eğitim programı, katılımcıların sertifika almalarıyla başarıyla tamamlandı.

Lecturers Şeyma Karabulut Aluçdibi and Tuğçe Bilge Yıldırım from the First and Emergency Aid Program participated in the 7.5-hour "Paramedic and EMT Case Class" training program organized by Hacettepeliler Akademi on August 24, 26, and 28, 2026, with the aim of keeping their professional knowledge and experience up to date and providing higher-quality education to their students. The knowledge and experience gained through the training are intended to be integrated into the educational processes of students in the First and Emergency Aid Program. The training program was successfully completed with the participants receiving their certificates.



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SHMYO Akademik

VSHS Academic

İstanbul Aydın Üniversitesi'nden Öğr. Gör. Dr. Ayşe Yazgan Akben, TÜSEB'in 2026-A4 Akademisyenlere Yönelik A4 Proje Destek Programı kapsamında desteklenen "Dijital Oyun Bağımlılığı Riski Taşıyan Genç Erişkinlerde Fizyolojik Geri Bildirim Entegreli Sanal Gerçeklik Tabanlı Egzersiz Müdahalesinin Geliştirilmesi ve Klinik Ön Değerlendirilmesi" başlıklı projede araştırmacı olarak yer aldı.

Lecturer Dr. Ayşe Yazgan Akben from Istanbul Aydın University took part as a researcher in the project titled "Development and Preliminary Clinical Evaluation of a Virtual Reality-Based Exercise Intervention Integrated with Physiological Feedback for Young Adults at Risk of Digital Game Addiction," supported under TÜSEB's 2026-A4 A4 Project Support Program for Academics.

**İSTANBUL AYDIN
ÜNİVERSİTESİ**

**TUSEB**
T.C. TÜRKİYE SAĞLIK ENSTİTÜLERİ BAŞKANLIĞI

**T.C. Türkiye Sağlık Enstitüleri Başkanlığı (TÜSEB)
Acil Araştırma ve Geliştirme Projelerini Destekleme Programı**

**Proje Adı: Dijital Oyun Bağımlılığı Riski Taşıyan Genç Erişkinlerde
Fizyolojik Geri Bildirim Entegreli Sanal Gerçeklik Tabanlı Egzersiz
Müdahalesinin Geliştirilmesi ve Klinik Ön Değerlendirmesi**

**Destekleyici Kuruluş: TÜSEB – 2026-A4 Akademisyenlere
Yönelik A4 Proje Destek Programı**

Proje Yürütücüsü: Dr. Öğr. Üyesi Elif Aleyna Yazgan (İstanbul Nişantaşı Üniversitesi)

Araştırmacılar: Dr. Öğr. Üyesi Gamze Kılıç (İstanbul Nişantaşı Üniversitesi)

Dr. Öğr. Üyesi Ecenur Atlı (Biruni Üniversitesi)

Öğr. Gör. Dr. Ayşe Yazgan Akben (İstanbul Aydın Üniversitesi)


**Dr. Öğr. Üyesi
Elif Aleyna Yazgan**


**Dr. Öğr. Üyesi
Gamze Kılıç**


**Dr. Öğr. Üyesi
Ecenur Atlı**


**Öğr. Gör. Dr.
Ayşe Yazgan Akben**

ROS-Induced DNA Damage Enhances Sensitivity to PARP Inhibition in HSC3 and SCC25 Head and Neck Squamous Cell Carcinoma Cell Lines Dr. Öğr. Üyesi Negar Taghavi Pourianazar'ın bu çalışmasında, baş-boyun kanserinde oksidatif stres ve DNA hasarının kanser hücrelerinin tedaviye verdiği yanıt üzerindeki etkisi araştırılmıştır. Çalışma, baş-boyun kanserinin tedavisine yönelik yeni yaklaşımların geliştirilmesine katkı sağlayabilecek bulgular sunmaktadır.

In her study titled "ROS-Induced DNA Damage Enhances Sensitivity to PARP Inhibition in HSC3 and SCC25 Head and Neck Squamous Cell Carcinoma Cell Lines," Assistant Professor Dr. Negar Taghavi Pourianazar investigated the effects of oxidative stress and DNA damage on the response of cancer cells to treatment in head and neck cancer. The study presents findings that may contribute to the development of new therapeutic approaches for the treatment of head and neck cancer.



Article

ROS-Induced DNA Damage Enhances Sensitivity to PARP Inhibition in HSC3 and SCC25 Head and Neck Squamous Cell Carcinoma Cell Lines

Negar Taghavi Pourianazar

Medical Laboratory Techniques, Vocational School of Health Services, Istanbul Aydın University, Istanbul 34295, Turkey; negarpourianazar@aydin.edu.tr

Abstract

Background: Head and neck squamous cell carcinoma (HNSCC) remains a highly aggressive malignancy with poor clinical outcomes. Although poly(ADP-ribose) polymerase (PARP) inhibitors have shown promising activity in tumors with homologous recombination deficiency, their efficacy in BRCA wild-type HNSCC remains limited. Reactive oxygen species (ROS)-induced DNA damage may increase cellular dependence on DNA repair pathways and thereby enhance sensitivity to PARP inhibition. This study investigated whether ROS-mediated DNA damage could sensitize BRCA wild-type HNSCC cells to the PARP inhibitor olaparib. **Methods:** BRCA wild-type HSC-3 and SCC-25 HNSCC cell lines were exposed to H_2O_2 to induce oxidative stress. Intracellular ROS levels were quantified using DCFDA assays. DNA double-strand breaks were evaluated by γ -H2AX ELISA. PARP activity was assessed by ELISA, and cell viability was determined using MTT assays. Expression levels of DNA repair genes (PARP1, PARP2, BRCA1, BRCA2, RAD51, and MLH1), checkpoint kinases (ATM, ATR, and CHK1), the homologous recombination regulator FANCD2, and redox defense genes (NQO1, GPX1, and SLC7A11) were analyzed by qRT-PCR. Therapeutic selectivity was assessed using HGF-1 normal human gingival fibroblasts as a normal cell control. Apoptosis was measured through caspase-3/7 activity assays, and drug interactions were evaluated using the Chou-Talalay method. **Results:** H_2O_2 treatment increased intracellular ROS levels in both cell lines, accompanied by significant induction of DNA damage as demonstrated by elevated γ -H2AX levels. ROS induction markedly enhanced olaparib sensitivity, significantly reducing IC_{50} values in both HSC-3 and SCC-25 cells. Combined H_2O_2 and olaparib treatment produced strong synergistic cytotoxicity, suppressed DNA repair, checkpoint kinase, and redox defense gene

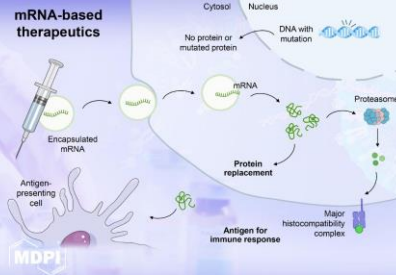
current issues in
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ISSN 1467-3045

RNA Therapeutics: Engineering the Future of Precision Medicine

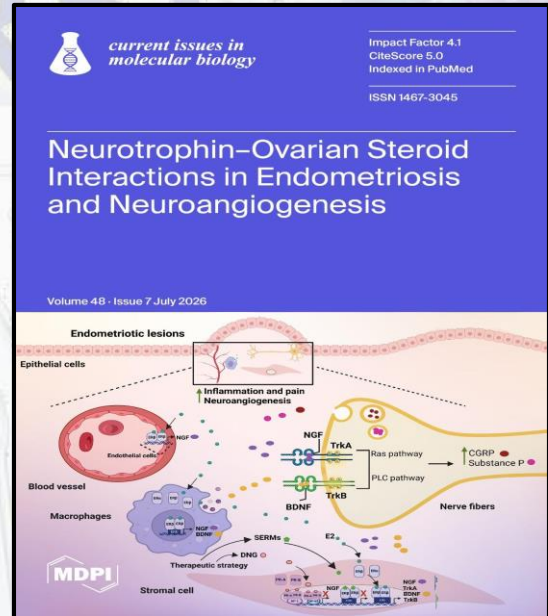
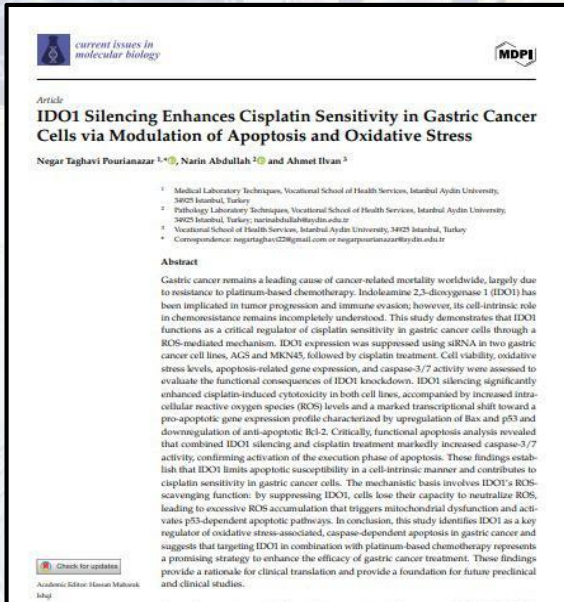
Volume 48 · Issue 8 August 2026

mRNA-based therapeutics



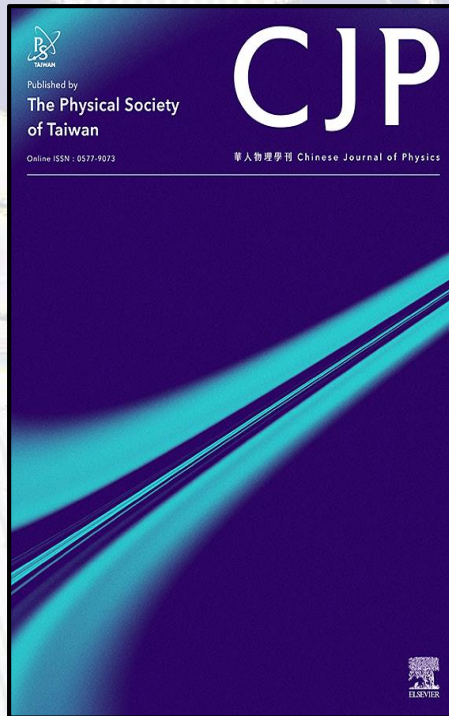
“IDO1 Silencing Enhances Cisplatin Sensitivity in Gastric Cancer Cells via Modulation of Apoptosis and Oxidative Stress” başlıklı çalışma, Prof. Dr. Ahmet İlvan, Dr. Öğr. Üyesi Negar Taghavi Pourianazar ve Dr. Öğr. Üyesi Narin Abdullah tarafından gerçekleştirildi. Çalışmada, mide kanseri hücrelerinde IDO1 geninin rolü ve kanser tedavisinde kullanılan cisplatine karşı hücrelerin duyarlılığı araştırıldı. Bulgular, IDO1 geninin hedeflenmesinin mide kanserinde tedaviye yanıtın artırılmasına yönelik potansiyel bir yaklaşım olabileceğini ortaya koymaktadır.

The study titled “IDO1 Silencing Enhances Cisplatin Sensitivity in Gastric Cancer Cells via Modulation of Apoptosis and Oxidative Stress” was conducted by Professor Dr. Ahmet İlvan, Assistant Professor Dr. Negar Taghavi Pourianazar, and Assistant Professor Dr. Narin Abdullah. The study investigated the role of the IDO1 gene in gastric cancer cells and their sensitivity to cisplatin, a drug commonly used in cancer treatment. The findings indicate that targeting IDO1 may represent a potential approach to enhancing treatment response in gastric cancer.



İstanbul Aydın Üniversitesi akademisyenlerinden Prof. Dr. Ulaş Özdem'in, "Charting doubly strange hidden-charm pentaquarks: An electromagnetic mapping of spin-1/2 and 3/2 states" başlıklı çalışması, Chinese Journal of Physics dergisinde yayımlanmıştır. SCI-Expanded (SCI-E) Q1 kategorisinde yer alan Chinese Journal of Physics dergisinde yayımlanan bu çalışma, Doç. Dr. Ulaş Özdem'in parçacık fiziği alanındaki uluslararası akademik çalışmalarına önemli bir katkı sağlamaktadır.

The study titled "Charting doubly strange hidden-charm pentaquarks: An electromagnetic mapping of spin-1/2 and 3/2 states", authored by Associate Professor Dr. Ulaş Özdem from Istanbul Aydın University, has been published in the *Chinese Journal of Physics*. Published in the *Chinese Journal of Physics*, a Q1 journal indexed in SCI-Expanded (SCI-E), the study represents a significant contribution to Associate Professor Dr. Ulaş Özdem's international academic research in the field of particle physics.



İstanbul Aydın Üniversitesi akademisyenlerinden Doç. Dr. Ulaş Özdem'in, "Magnetic dipole moments as probes of doubly-bottom molecular pentaquarks" başlıklı çalışması, Chinese Physics C dergisinde yayımlanmıştır. Doç. Dr. Ulaş Özdem'in çalışması, SCI-Expanded (SCI-E) Q1 kategorisinde yer alan Chinese Physics C dergisinde yayımlanarak üniversitemizin uluslararası akademik yayın performansına katkı sağlamıştır.

The study titled "Magnetic dipole moments as probes of doubly-bottom molecular pentaquarks", authored by Associate Professor Dr. Ulaş Özdem from Istanbul Aydın University, has been published in *Chinese Physics C*. Published in *Chinese Physics C*, a Q1 journal indexed in SCI-Expanded (SCI-E), the study contributes to the international academic publication performance of Istanbul Aydın University and further strengthens Associate Professor Dr. Ulaş Özdem's international academic research in the field of particle physics.

Magnetic dipole moments as probes of doubly-bottom molecular pentaquarks

Ulaş Özdem^a
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We investigate the magnetic dipole moments of doubly-bottom pentaquark states with spin-parity $J^P = \frac{1}{2}^+$ and $\frac{3}{2}^+$, interpreted as hadronic molecules in the $B\psi_2$ and $B^*\psi_2$ configurations. The analysis is performed within the framework of QCD light-cone sum rules employing photon distribution amplitudes. Our results demonstrate a strong sensitivity of the magnetic dipole moments to the internal spin structure and quark composition of the states. In particular, the light-quark sector provides the dominant contribution in the $B\psi_2$ configuration, while the magnetic moment of $B\psi_2$ is largely governed by the heavy bottom quark. For the $B^*\psi_2$ molecular state, both light and heavy sectors contribute constructively, leading to a significantly enhanced magnetic dipole moment. These findings indicate that magnetic dipole moments constitute a sensitive probe of the internal structure of molecular-type doubly-bottom pentaquarks and provide testable predictions for future experimental studies.

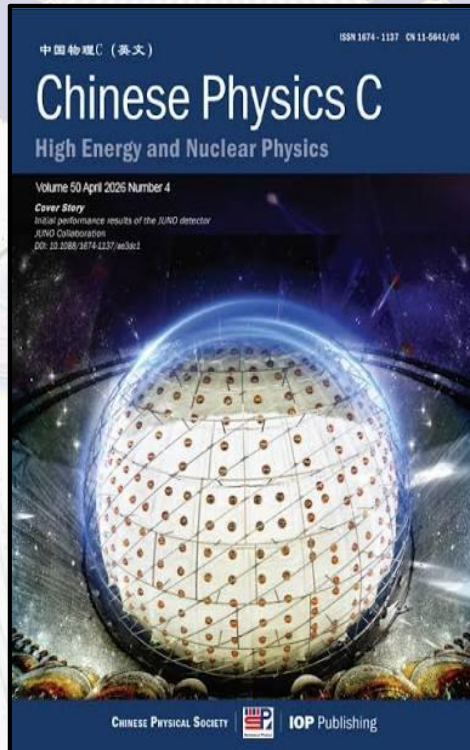
1. MOTIVATION

The conventional quark model, which categorizes hadrons as mesons (quark-antiquark pairs) or baryons (three-quark states), is insufficient to explain the existence of exotic hadrons, such as compact multiquark configurations and hadronic molecules. These unconventional states, lying beyond the standard framework, have become a major focus of modern hadron physics. Over the past three decades, both experimental discoveries and theoretical advances have significantly intensified research efforts in this area. In particular, several hidden-charm pentaquark states have been discovered, including the $P_c(4380)$, $P_c(4440)$, $P_c(4457)$, $P_c(4312)$, $P_c(4450)$, and $P_c(4380)$ [1–6]. Since these states contain at least five quarks (quark as *core* or *ends*), they are strong candidates for being classified as hidden-charm pentaquarks. In 2021, the LHCb Collaboration further reported the observation of the first doubly-charm tetraquark, $T_{cc}^+(3675)$, in the $D\bar{D}^*\pi^+$ invariant mass spectrum [5, 6]. The simplest quark model interpretation of this state is a *c* quark configuration with quantum numbers $J^P = 1^+$. Following these experimental breakthroughs, a variety of theoretical models have been proposed to explain the structure and properties of these exotic states. These include interpretations as compact multiquark states, hadronic molecules, or even manifestations of diquark effects [7–22]. Nevertheless, despite significant progress, the internal substructure and the precise quantum numbers of these multiquark states continue to pose fundamental challenges in high-energy hadron physics.

The discovery of the $T_{cc}^+(3675)$ tetraquark state opens a novel avenue for the search for states beyond conventional hadrons. If $T_{cc}^+(3675)$ is indeed a genuine doubly-charm tetraquark, then by analogy, one may expect the existence of doubly-bottom pentaquark states as well. This

reasoning mirrors the approach taken to predict hidden-charm pentaquarks based on the discovery of hidden-charm tetraquarks. In the absence of experimental evidence for doubly-bottom pentaquarks, it is imperative to understand the underlying reasons behind their apparent non-observation. To this end, several theoretical investigations have been carried out to explore the possible existence and properties of doubly-charm/bottom pentaquark states [23–35]. These studies generally suggest that the doubly-bottom pentaquarks lie below the relevant meson-baryon thresholds, making the formation of bound states feasible. Compared to doubly-charm systems, doubly-bottom pentaquarks are anticipated to be heavier. However, due to the complex dynamics of multiquark systems, their actual mass may be reduced, making it difficult to distinguish them from conventional baryons on the basis of mass alone. Therefore, studying other characteristics—particularly their electromagnetic properties—can offer essential insights into their underlying structures.

The electromagnetic multipole moments are measurable quantities that can provide critical insights into the internal quark-gluon structure and dynamics of hadronic states. Specifically, in photo- and electro-production processes, the magnetic dipole moments (MDMs) of hadrons play an essential role in shaping both the total and differential cross sections. As such, determining the MDMs of hadronic states is vital for understanding their internal configuration. Although the electromagnetic properties of hadrons have received less attention compared to their mass spectra, production mechanisms, quantum numbers, or decay channels, recent years have seen growing interest in these observables. This is especially true for exotic states with ambiguous internal compositions, where electromagnetic characteristics can serve as critical probes [36–60]. In this work, we use the QCD light-cone sum rule (LCSR) method to compute the MDMs of the $B^{(*)}\psi_2^{(*)}$ states, considering them as molecular configurations: $B\psi_2$, $B^*\psi_2$, and $B\psi_2^*$, with quantum numbers $J^P = \frac{1}{2}^+$, $J^P = \frac{1}{2}^+$, and $J^P = \frac{3}{2}^+$, respectively.



İstanbul Aydın Üniversitesi akademisyenlerinden Öğr. Gör. Şeyma Arslanbaş'ın gerçekleştirdiği "An Explainable Machine Learning Framework for Predicting Hearing Aid Satisfaction: Integrating the HATASS Instrument and Clinical Insights" başlıklı çalışması, Bioengineering dergisinde yayımlanmıştır. SCI-Expanded (SCI-E) Q2 kategorisinde yer alan Bioengineering dergisinde yayımlanan çalışma, yapay zekâ ve makine öğrenmesi yöntemlerinin işitme sağlığı alanındaki klinik değerlendirmelere entegrasyonuna katkı sunmaktadır.

The study titled "An Explainable Machine Learning Framework for Predicting Hearing Aid Satisfaction: Integrating the HATASS Instrument and Clinical Insights", conducted by Lecturer Şeyma Arslanbaş from Istanbul Aydın University, has been published in *Bioengineering*. Published in *Bioengineering*, a Q2 journal indexed in SCI-Expanded (SCI-E), the study contributes to the integration of artificial intelligence and machine learning methods into clinical assessments in the field of hearing health.

Open Access Article

An Explainable Machine Learning Framework for Predicting Hearing Aid Satisfaction: Integrating the HATASS Instrument and Clinical Insights

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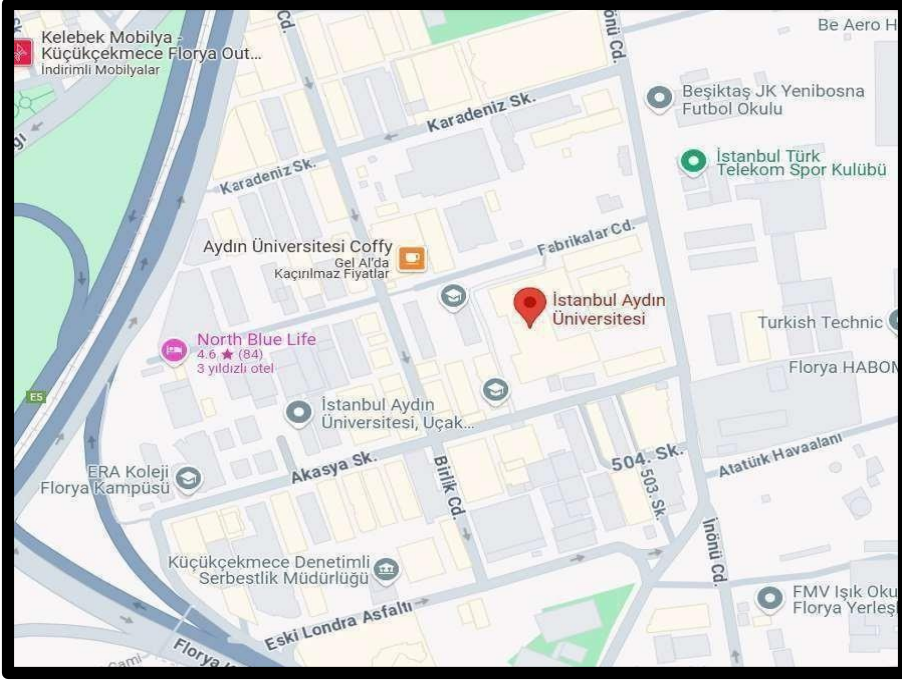
Abstract

Hearing aid technology adaptation and user satisfaction are influenced by multiple interacting demographic, clinical, and behavioral factors, making reliable prediction of outcomes challenging with conventional statistical approaches alone. This study proposes an explainable machine learning framework to investigate the multidimensional determinants of hearing aid satisfaction by integrating demographic characteristics, hearing aid-related variables, and patient-reported outcomes obtained from the Hearing Aid Technology Adaptation and Satisfaction Scale (HATASS). Five regression algorithms—Linear Regression, Decision Tree Regression (DTR), Random Forest Regression (RFR), Support Vector Regression, and Gradient Boosting Regression (GBR)—were comparatively evaluated using a five-fold cross-validation strategy. Predictive performance was assessed using the root mean square error (RMSE), mean absolute error (MAE), and the coefficient of determination (R^2), while model interpretability was investigated through cross-validated out-of-bag permutation feature importance analysis. Among the evaluated algorithms, Random Forest Regression achieved the most consistent predictive performance, yielding the lowest average RMSE (14.225) and the highest average R^2 (0.146) under the adopted validation framework. Although the overall predictive performance remained modest, the explainability analysis consistently identified age as the most influential predictor, followed by onset year, education level, hearing aid usage duration, and daily hearing aid use. In contrast, gender, battery type, tinnitus, and vertigo contributed comparatively less to model predictions. These findings indicate that hearing aid adaptation and satisfaction arise from complex nonlinear interactions among demographic, behavioral, clinical, and device-related characteristics rather than isolated linear associations. The proposed framework provides an interpretable, internally validated analytical approach for investigating hearing aid technology adaptation and satisfaction and establishes a foundation for future studies that integrate comprehensive audiological measurements, longitudinal follow-up data, and independent external validation to support the development of more transparent and personalized hearing healthcare systems.

Keywords: hearing aid satisfaction; technology adaptation; explainable machine learning; audiological rehabilitation; feature importance; ensemble learning; user-centered care



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