2023 VOLUME 1

gemstone

ANNUAL MAGAZİNE

Discover the Brilliance of Gemstone: Unveiling a Year of Achievements in Neuroscience Research!

Greetings from the GEMSTONE project! As we reflect on the past year, we are delighted to share with you an extraordinary journey of innovation and collaboration in the field of neuroscience. Our newsletter serves as a chronicle of the achievements, breakthroughs and endeavours that have shaped our pursuit of knowledge and excellence.

Join us on a fascinating exploration of the latest advances, collaborative initiatives and key achievements that have put GEMSTONE at the forefront of neuroscience research.

From successful collaborations to transformative discoveries, this newsletter captures the spirit of our dedicated team and the remarkable progress we've made in understanding the complexities of the brain.

Get ready to delve into a world of scientific brilliance, where every achievement contributes to our overarching goal of advancing neurological research. We thank you for being part of our journey and invite you to celebrate the collective success and promise that the future holds for GEMSTONE.

ACIBADEM MEHMET ALİ AYDINLAR UNIVERSITY MMVII

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Kick-off Meeting of Gemstone

The kick-off meeting of GEMSTONE was convened on November 3, 2022, Thursday, at Acibadem University, Istanbul. This event saw the active participation of academic and administrative staff from partner institutions, including Acıbadem University, Lund University, and Fondazione ICONS. The coordination of GEMSTONE is overseen by Prof. Dr. Filiz Onat, a faculty member at the School of Medicine, Acibadem University. The initiation of GEMSTONE marks the establishment of a collaboration that will enhance ties and leverage knowledge transfer from a distinguished European academic institution (ULUND) and a non-profit organization (ICONS). The successful launch sets the stage for a productive year ahead.

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1st. Dissemination Event:Regional Symposium Neurodevelopmental Aspects of Brain Disorders & Genetically Engineered Models

The Acibadem University Gemstone Project's 1st Dissemination Event hosted the Regional Symposium on Neurodevelopmental Aspects of Brain Disorders & Genetically Engineered Models on October 3rd and 4th 2023. The symposium aimed to advance scientific research and innovation in Neurodevelopment and Genomic Engineering with 138 participants from domestic and international backgrounds. Organised with the support of the Turkish Brain Research Association, the event highlighted the importance of scientific presentations, funding opportunities for neuroscience research, and the significance of university-industry collaboration. The Gemstone Project, led by Acibadem University faculty member Prof. Filiz Onat, aims to improve scientific productivity. On the first day, keynote speakers included Prof. Annamaria Vezzani, Dr. Annika Luettjohann and Assoc. Prof. Nihan Çarçak Yılmaz and Assoc. Prof. Kasım Diril, Dr. Ali Özüer, who discussed genomic engineering technologies and neuroscience. On the second day, Prof. Emilio Russo, Prof Deniz Kırık, Assoc. Prof. My Andersson, Assoc. Prof. Kasım Diril led discussions on laboratory research and capacity building activities. On the second day focused on neuroscience research and industry collaboration, featuring presentations by Prof. Emilio Russo, Prof. Deniz Kırık, Assoc. Prof. My Andersson, and Dr. Ali Özüer, the President of Abdi İbrahim Bio, among others. The event concluded with awards for the Best Oral Presentation, awarded to Berfin Dağ for "Confirmation of PATL1 Gene as Neurodevelopmental Disease Gene by Fruit Fly Model," and the Best Poster Presentation, won by Alper Bülbül for "A Comparative Analysis for Familial Exome Analysis: Identifying Infrequent Rare Variants in Families with Multiple Sclerosis".

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2nd. Dissemination Event: Joint Meeting with Turkish Epilepsy Society

Explore epilepsy research at the 'Translational Approach in Epilepsy' symposium hosted by Acıbadem Mehmet Ali Aydınlar University on December 23, 2023. This event combines clinical expertise with cutting-edge research, offering a comprehensive exploration of epilepsy from clinical to basic sciences. During the morning session, Assoc. Prof. Melike ŞAHİNER and Prof. Dr. Rezzan GÜLHAN Conducted a SWOT analysis of translational research in Turkey. Additionally, Prof. Filiz ONAT highlighted the GEMSTONE project and link the symposium to groundbreaking research initiatives. This symposium offered an opportunity to exchange knowledge and insights while aligning with the overarching goals of the GEMSTONE Project. This meeting was pivotal, serving as a platform for intellectual exchange in line with the broad aims of the GEMSTONE project. It was instrumental in fostering a dialogue about epilepsy research, marking a significant step forward in the field.

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Capacity Building Activities of Research Office Staff

In November and December 2022, we carried out preliminary preparations to enhance research support capacity within the GEMSTONE project. In January and February 2023, a focus group consisting of 8 TTO members and 1 manager was convened and interviews were conducted to assess their competence levels. At the same time, a questionnaire was distributed to the researchers contacted to assess the effectiveness of the TTOs. In March, it was decided, on the basis of the report submitted, to proceed with the training, which was conducted by Serena Cogoni in April and May.

The recipients of the training at each level were disclosed, and the training materials and content for the mentoring programme were carefully prepared in October. A total of 18 individuals underwent a comprehensive 6-hour training session in one day. Additionally, TTO office promotion meetings were successfully conducted.

The GEMSTONE project has collaborated with Lund University's Research Support Services to advance ACU's scientific research and innovative capacity in the strategic areas of gene technology and neuroscience, focusing on the neurodevelopmental aspects of brain disorders such as Parkinson's disease and epilepsy. On March 9th, 2023, Rickard Eksten, Research Funding Advisor at Research Services, led a meeting to improve organizational capacity and knowledge transfer. During the meeting, Lund University staff, such as Fariba Vaziri-Sani, Project Manager at LU Cooperation Office, and Per Mercke, Patent Advisor at LU Innovation, presented their services to the GEMSTONE project's Technology Transfer Office staff. Under GEMSTONE WP4 - Organizational capacity to support research, this virtual collaboration facilitated an exchange of insights and best practices in research support services between teams. The discussion covered various topics, including research data management, intellectual property rights, and funding opportunities. Eda Tanoğlu, ACU's TTO Manager, stated that the meeting significantly contributed to enhancing the organization's capacity and identifying areas for improvement in research support services.

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Training Workshops for Research Capacity Building

These courses, led by Serena Cogoni from Fondazione ICONS, a partner of the GEMSTONE project, were tailored to equip researchers with essential skills and knowledge to thrive in the international research landscape.

The first training course, held in November 2022, focused on the critical areas of grant writing and scientific writing. Researchers were immersed in the intricacies of the grant writing process, including analyzing calls for proposals, structuring application forms, and understanding the evaluation process. Importantly, the GEMSTONE project served as a compelling case study, enriching the learning experience.

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GEMSTONE: 1st Training Workshop by Serena Cogoni

The 1st Training Workshop on "Grant Writing and Management & Scientific Writing and Publishing," a key component of the GEMSTONE project, was held on November 4, 2022, at Acıbadem University, Istanbul, Turkey. The event, attended by forty-nine young researchers (PhD students, PhD candidates, and Post-docs), aimed to enhance scientific skills among early-stage researchers in neuroscience. Certificates were awarded to the participants in recognition of their completion of the workshop.

The overarching goal of the workshop was to elevate the scientific innovation capacities of early-stage and young researchers in neuroscience, particularly focusing on grant writing, management, and publishing skills. Dr. Åsa Petersen from Lund University, Sweden, presented scientific research ideas related to translational research for neurodegenerative disorders. Serena Cogoni from Fondazione ICONS, Italy, provided an introductory speech on "How a European funded grant works? The GEMSTONE case study" and "Introduction to scientific writing," tailoring the content to participants' neuroscience backgrounds.

During the workshop, participants had the opportunity to benefit from the experiences of Astrid Nehlig, the former Chief Editor of EPILEPSIA, who delivered a speech on "Scientific writing and publishing: Reviewer perspective." The event successfully contributed to the professional development of young researchers by imparting essential skills in grant writing, management, and scientific publishing.

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GEMSTONE: 2nd Training Workshop by Serena Cogoni

In October 2023, the landscape of EU-funded health research projects was explored in the second training course titled "What does it mean to be involved in an EU-funded health research project?" Participants were provided with insights into the requirements and expectations associated with engagement in such projects, whether in the capacity of a coordinator or a partner. Strategies for identifying opportunities and cultivating successful participation in EU-funded projects were conveyed, with a specific emphasis on the establishment and cultivation of professional networks within this context.

These courses play a pivotal role in achieving the overarching goal of the GEMSTONE project, which is to enhance the research capabilities of Acibadem University. This enhancement enables researchers to publish in high-impact journals, lead international research projects, attract funding, and bolster their networking capacity within the global neuroscience community. The project also seeks to facilitate the bilateral exchange of scientific knowledge and technical skills, positioning the university prominently in the European and global research landscape.

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Webinar on Cre-Lox System in Experimental Models

Dr. Tuğba Eryiğit presented the Cre-Lox technology used in mouse modeling for brain disorders, which is a crucial component of the GEMSTONE research project. The Cre-Lox technology is a potent and adaptable tool for mouse genetics, providing precise control over gene expression location and timing in mouse models. The Cre/lox system is widely used in brain disorder research for creating knockout alleles and activating gene expression. Dr. Tuğba Eryiğit gained expertise in these technologies during her PhD studies at Lund University under the guidance of Professor Deniz Kırık, a leading researcher in the GEMSTONE Project. She now transfers her knowledge to post-doctoral researchers and PhD students in Neuroscience at Acıbadem University.

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Transfer of DRD1A Animals from ULund

All necessary approvals from the Ministry of Agriculture and Forestry have been obtained, marking a significant milestone. The Lund University team has successfully transported the transgenic DRD1a to Acıbadem Mehmet Ali Aydınlar University, achieving Milestone 6 within the GEMSTONE Project. The transgenic DRD1a's arrival sets the stage for pioneering research within the GEMSTONE Project, ushering in a new era of scientific exploration. This achievement underscores our commitment to advancing global research capabilities. The collaboration between Acıbadem Mehmet Ali Aydınlar University and Lund University serves as a catalyst in unraveling the intricate complexities of the brain.

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Genger EX Cross-Cutting Meeting

The GEMSTONE project and the GENDEREX Twinning Project, coordinated by Kadir Has University, recently collaborated on cross-cutting issues in Horizon Europe, with a particular focus on gender equality in research. The discussion series involved sharing perspectives on gender equality and deliberating ways to integrate research in neuroscience into the gender equality dimension. This collaboration aims to promote gender equality in research by facilitating joint efforts and exchanging knowledge and expertise. The GEMSTONE project team is excited to connect with the GENDEREX Twinning Project and looks forward to potential future collaborations. This partnership is expected to have a significant impact on promoting gender equality in research and advancing the understanding of the brain and nervous system.

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Webinar on Cross Cutting Issues in Horizon Europe:Open Science

An online seminar titled 'Open Science Management' was conducted for GEMSTONE Researchers. The seminar was presented by Ayça Aydemir Mazlumoğlu, Manager of ACU Library. The significance of openscience was emphasized by the European Commission for its potential to enhance the quality, efficiency, and impact of research and development. The seminar thoroughly discussed this topic. The session aimed to promote an integrated scientific dissemination perspective within the GEMSTONE project. The focus was on the concept of open science and associated publication opportunities. It was emphasized that all peer-reviewed scientific publications, as outputs of the Horizon Europe grant, must be made available in open access.

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Webinar on Open Science Management in Horizon Europe

A webinar series has been launched to provide information on cross-cutting topics in the Horizon European Framework Program calls. The first event was held on Tuesday, March 28, 2023, between 14:00 and 16:00. The speakers included TÜBİTAK Horizon Europe Research Infrastructures National Contact Point Ebru Soyuyüce Aydın and İzmir Institute of Technology Library and Documentation Department Head Gultekin Gurdal. 'Horizon Europe Open Science and National Open Science Infrastructure', presented by Ebru Soyuyüce Aydın (TÜBİTAK, Horizon Europe Research Infrastructures National Contact Point), and 'OpenAIRE Services and Enterprise Infrastructures'.

The event covered two main topics: It provided valuable insights into key aspects of the Horizon European Framework Program.

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Development in Research: Role of Oroxin Synergic System in Absence Epilepsy

Significant progress has been made in laboratory research within the GEMSTONE project, specifically in investigating the role of the orexin synergic system in absence epilepsy. This study focuses on the cortico-thalamo-cortical network, which is responsible for spike-and-wave discharges in sleep spindles and absence seizures. In Strasbourg-origin rats with genetic absence epilepsy, intra-ventricular injections of orexin ligands have been administered and are nearing completion. The objective is to investigate the correlation between the orexinergic system and the pathophysiology of absence epilepsy. This study aims to clarify the cellular-level mechanisms of seizures in absence epilepsy, which will aid in the development of targeted therapeutic strategies and improve our comprehension of brain function during seizures.

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Development in Research: Initiation of Parkinson's Research

Within the GEMSTONE project's laboratory research developments, a significant initiative was the commencement of Parkinson's research. This research aligns with the overarching goal of investigating neurodevelopmental changes leading to absence epilepsy and Parkinson's disease. Our focus in Parkinson's research was to unravel the origins of the pathogenic protein alpha-synuclein, which is implicated in the genesis of Parkinson's disease. To achieve this objective, transgenic animals targeted at alpha-synuclein were employed. As part of the project, these genetically engineered animals have been successfully transferred to Acıbadem Mehmet Ali Aydınlar University. This significant step will pave the way for in-depth research and contribute to advancing our understanding of Parkinson's disease within the GEMSTONE framework.

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Development in Research:Transgenic Colonies and Colony Management

Significant progress has been made in the laboratory research domain of the GEMSTONE project to increase the number of transgenic colonies at our university and institutionalize colony management. Transgenic animals have become essential in scientific research, particularly in neuroscience, due to the advancement of genetic engineering technologies. The Transgenic Animal Research and Biosafety Laboratory, located in the Experimental Animals Application and Research Centre (ACU-DEHAM) at our university, is well-known for its expertise in life sciences and health. It provides the necessary facilities for our work. As part of the GEMSTONE project, we have successfully transferred essential transgenic animal colonies to our university.

Our focus is on modelling neurological diseases, such as absence epilepsy and Parkinson's disease. The project's improvements to colony management infrastructure will ensure the sustainability of this valuable research opportunity for future studies at ACU.

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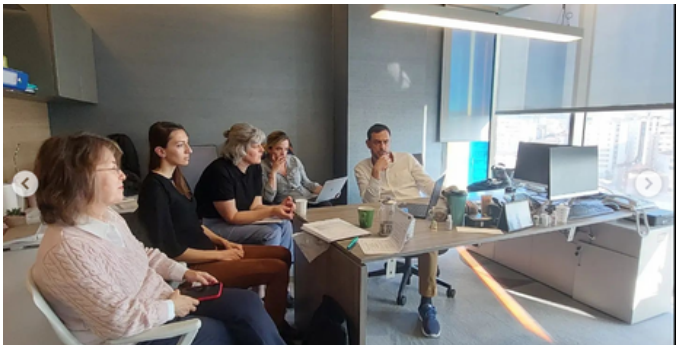

My Anderssons's Visit to ACU

From October 31 to November 2, 2022, My Andersson from Lund University (ULUND) visited Acıbadem University (ACU) as part of the GEMSTONE project. The purpose of the visit was to transfer knowledge and research capacity between ULUND and ACU. Assoc. Prof. Andersson aimed to familiarize herself with the knowledge and technical skills of the research participants in GEMSTONE, evaluate the available facilities, infrastructure, and technologies at ACU, and compile a comprehensive list of requirements for the successful implementation of our research. A carefully planned schedule facilitated visits to research facilities over the course of a three-day stay, enabling discussions on mutual research interests with key participants. This visit established the foundation for a comprehensive plan for future collaboration, which includes exchanging expertise and training bilaterally.

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Filiz Onat's Visit to ULund

Prof. Filiz Onat, the PI of GEMSTONE, visited Lund University for 3 days from 3 to 5 May 2023. The purpose of the visit was to gain knowledge about production methods associated with genetically engineered animal models, in order to make informed decisions upon her return to ACU. During her visit, Prof. Onat attended Neuroscience Day in Lund, which provided insights into the latest developments in neuroscience research. Discussions are ongoing with the principal investigator and co-investigators to determine the most suitable protocol for the project. A thorough understanding of Lund University's resources, including labour and equipment, is necessary to evaluate and discuss methods in terms of sustainability. The visit, which included participation in Neuroscience Day, provided valuable opportunities for knowledge expansion and insights that are beneficial to the GEMSTONE project. The insights and knowledge acquired will significantly contribute to the project's goal of developing new therapies for neurological disorders.

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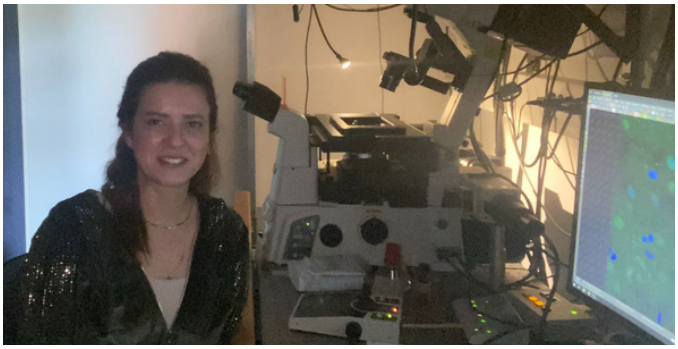
Nihan Çarçak Yılmaz's Visit to ULund

Assoc. Prof. Nihan Carcak Yilmaz, the leader of WP2 in the GEMSTONE Project, successfully completed a short visit to Lund University. The purpose of the visit was to share knowledge on experimental techniques for implementing WP2 experiments and to strengthen collaboration between Lund University and Acıbadem University. During the visit, Assoc. Prof. Carcak Yilmaz received training in various experimental techniques, such as chemogenetic methods, microelectrode array (MEA), and genotyping procedures for Drd1a mice. The primary objective of Assoc. Prof. Carcak Yilmaz's visit was to conduct experiments related to Tasks 2.2 and 2.3,

which involve chemogenetic modulation and monitoring cortical neurodevelopment of deep cortical layer neurons in GAERS, respectively. The visit was successful and significantly contributed to Dr. Yilmaz's personal academic development and GEMSTONE Project.



Elif Nedret Keskinöz's Visit to ULund

Asst. Prof. Elif Nedret Keskinöz, a researcher on the GEMSTONE project, completed her short visit to Lund University from 21 May to 28 May 2023. During her stay, she was supervised by Prof. Deniz Kırık and focused on Project Task 3.2, specifically correlative electron microscopy. Efforts were dedicated to successfully executing Task 3.2, with a particular emphasis on honing skills in correlative electron microscopy and gaining valuable insights. The main purpose of the visit was to gain practical experience and training to successfully complete Task 3.2. It is pleasing to note that Dr. Keskinöz received guidance and collaborated with her supervisor, Deniz Kırık, at Lund University in planning the experiments.

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Samed Özer's and Aslı Önder Gül's Visit to ULund

Between May 21, 2023, and May 28, 2023, Lund University hosted key staff from the ACU Laboratory Animal Research Center, including Biologist Aslı Önder Gül and Manager Dr. Samed Özer. The purpose of their visit was to focus on Task 3.2, which involved mouse in vitro fertilization (IVF) procedures and the establishment of a database platform for transgenic animal management. Collaborations were facilitated with Thomas Blom, Linda Wei, and Sara Andersson during their visit. The purpose of the visit was to achieve the objectives related to Task 3.2, which involved essential procedures and the establishment of a robust database platform for managing transgenic animals. The collaboration between the ACU team and their counterparts at Lund University significantly contributed to the successful execution of Task 3.2 within the GEMSTONE project.

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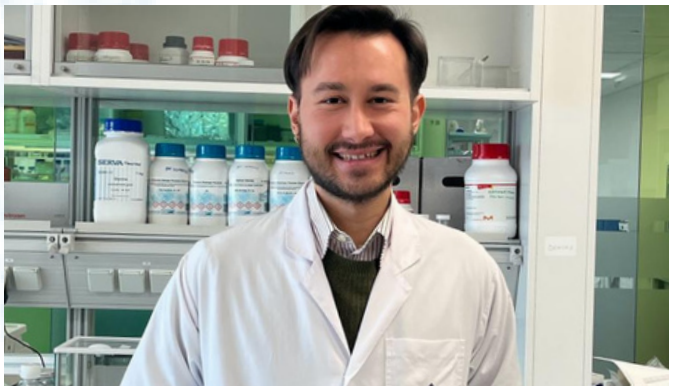
Talat Taygun Turan's Visit tu ULund

The GEMSTONE project achieved a significant milestone with the completion of a one-month research visit to Lund University B.R.A.I.N.S. laboratory by visiting doctoral student and Project Researcher Talat Taygun Turan. The visit took place from September 4, 2023, to October 4, 2023, under the careful supervision of Prof. Dr. Deniz Kırık. The main purpose of the visit was to participate in collaborative research and exchange knowledge within the GEMSTONE framework. The researcher gained valuable insights, fostering collaborative efforts that significantly contributed to the overall progress and success of the GEMSTONE project. The exchange of expertise and collaboration at Lund University not only enriched the academic experience of the



visiting researcher but also played a pivotal role in further fortifying the partnership between the collaborating institutions. The researcher's exposure to various subjects, such as transgenic animal/Cre-lox recombination technology, PCR, Protein Analysis/Capillary Western Blot, and AlphaLISA Immunoassays, improved the overall research capabilities within the GEMSTONE project.

Publications by Gemstone Researchers

The GEMSTONE project's publications are an integral part of achieving the project's dissemination objectives, ensuring that the insights and innovations arising from the research are accessible to researchers and practitioners around the world. By embedding the project's findings in the scholarly literature, these publications encourage further research, stimulate scholarly debate and pave the way for future research endeavours.

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Articles

"Involvement of orexin type-2 receptors in genetic absence epilepsy rats", Aylin Toplu, Nursima Mutlu, Elif Tugçe Erdeve, Özge Sariyildiz, Musa Çelik, Devrim Öz Arslan, Zoltan Molnar, Nihan Çarçak, Filiz Onat, **Frontiers in Neurology-Epilepsy**, 2023.

"Optogenetics for controlling seizure circuits for translational approaches" Marco Ledri, My Andersson, Jenny Wickham,Merab Kokaia, **Neurobiology of Disease**, *August 2023*

Poster Presentation

·*"The Effect of Intracerebroventricular Orexin-A Injection on Spike-and-Slow-Wave Discharges in Rats with Genetic Absence Epilepsy of Strasburg Origin"*- Elif Tuğçe Erdeve, Nursima Mutlu, Özge Sarıyıldız, Nihan Çarçak Yılmaz, Filiz Onat, 23-26 November 2023- **27. National, 2. International Pharmacological Congress.**

Networking Activities by Gemstone Team

Prof. Beki Kan, Assoc. Prof. Devrim Öz Arslan and Talat Taygun Turan participated in CA21117 - "The Role of IMMUnity in Tackling PARKinson's Disease through a Translational NETwork (IMMUPARKNET)". This commitment reflects a concerted collaborative effort. Prof. Yasemin Gürsoy Özdemir has been appointed as the contact person for IMMUPARKNET in Turkey. Contact has been established with Prof. Özdemir and efforts are being made to explore new opportunities for cooperation.

Gemstone activities were also presented in Sevilla, Spain during the Immuparknet meetings. In this programme, Gemstone introduced to group and new opportunities for cooperation will be explored.

Project Applications by Gemstone Researchers

Gemstone researchers have actively pursued excellence in their field by successfully applying for various research grants. Their dedication to advancing scientific knowledge in neuroscience is evident through the diverse range of funded projects by reputable organizations. These achievements reflect the team's commitment to investigating complex scientific questions and contributing valuable insights to the field.

Research and Development Programme of Health Intitutes of Turkiye (TUSEB)
Assoc. Prof. Nihan Çarçak Yılmaz
“Investigation Of The Pathogenic Role Of Autoantibodies Against Neuronal Surface Antigens In Autoimmune Epilepsy.

Reserch and Development Programme of Health Intitutes of Turkiye (TUSEB)
Assoc. Prof. Merve Açıkel Elmas
“Investigation of the Putative Therapeutic Effect of Ferulic Acid on Fertility in MSG-induced Testicular Damage by Biochemical and Morphological Methods.

TUBITAK–2214/A International Research Fellowship Programme
Aylin Toplu
"Investigation of orexinergic system-mediated dopamine modulation in Genetic Absence Epilepsy Rats of Strasbourg Origin (GAERS) and Drd1a-Cre mice."

TUBITAK–2214/A International Research Fellowship Programme
Elif Tuğçe Erdeve
"Investigation of the Role of the Orexinergic System in the Pathophysiology of Absence Epilepsy"

European Cooperation in Science and Technology-COST TUBITAK Association, (ANDRONET)-CA20119
Assoc. Prof. Merve Açıkel Elmas
“Determination of the role of testosterone on fertility in the brain-testicular axis in hypogonadism.”

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