

# CoE for Functional SURfaces and interfaces for Nano diagnostics (EFSUN)



Activity Report September 2018-September 2019

## Introduction

The Center of Excellence for Functional Surfaces and interfaces for Nano diagnostics (EFSUN) was established in September 2016. The Center aims at the discovery of efficient tools for an early, efficient accurate, cheap and on-site diagnosis of important health problems using nanotechnology tools. Highly qualified local researchers in various fields, including medicine, molecular biology, genetics, pathology, chemistry, physics, engineering, nanotechnology and electronics were brought together in the center in order to generate original, innovative and patentable knowledge and produce high impact research. Moreover, interdisciplinary nature of the center facilitates coordinated interactions between members from different fields to reach a common goal of generation of high-tech nano-based diagnostic devices. The advisory board consists of outstanding and experienced researchers from the best institutes and universities in the US and in Europe. EFSUN is now a center of attraction in the fields of nanotechnology and medical diagnostics in Turkey as well as in the region, and it always welcomes motivated researchers who would like to join forces to reach this goal.

The Center was founded by 5 scientists who were soon joined by 36 scientists, who are world-class experts in their respective fields. Contributing members are recipients of various prestigious national and international awards. Collaborations with the industry are ongoing. More than 33 Ph.D. students and 34 M.S. students as well as more than 10 Post Doctoral Research Associates are benefitting from the stimulating and collaborative environment of the Center.

Within a short time, the Center became a 'Research Powerhouse' at Sabanci University with exhaustive and collaborative efforts of the members. The research efforts and collaborations in the Center led to more than 64 journal publications in top journals (such as International Journal of Heat and Mass Transfer, Chemical Engineering Journal, Nature Scientific Reports, Nanoscale, etc.) within 12 months, 9 joint patents applications were made, and 3 joint patent grants were obtained within 12 months. Significant large scale grants were also obtained from both national and international resources. The ongoing project budget is now more than 4,500,000 Euro. Our Center is now seeking for TUBITAK (The Scientific and Technological Research Council of Turkey) 1004 Center of excellence Funding in collaborations with our outstanding centers in Turkey such as SUNUM (Sabanci University Nanotechnology and Applications Center). The members are self sustaining the Center and providing high impact outputs within the framework of the Center without any substantial support from Sabanci University.

We are happy to provide our contributions for organizing exciting events such as 'The Functional Surfaces and Interfaces Workshop' held at Sabanci University SUNUM building and 'Applied Nanotechnology Winter School' for High School students in collaboration with SUNUM.

This activity report is intended to provide a collection of the outputs of the center.

Ali Koşar      and      Burç Mısırlıođlu- Co-Directors

Devrim Güzüaçık- Vice Director

## Executive Board Members



Ali Koşar



Burç Mısırlıođlu- Co-Directors



Devrim Gözüađık- Vice Director



Gözde İnce



Kürşat Şendur



Murat Kaya Yapıcı



Funda Acar Yađcı

## Contact information

Address:

Sabanci University

Faculty of Engineering and Natural Sciences

Orhanli - Tuzla, 34956, Istanbul, Turkey

Phone: (+90) 216 483 96 00

Website:

<http://efsun.sabanciuniv.edu/>

E-mail:

Professor Ali Kosar ([kosara@sabanciuniv.edu](mailto:kosara@sabanciuniv.edu))

Professor Burc Misirlioglu, ([burc@sabanciuniv.edu](mailto:burc@sabanciuniv.edu))

Professor Devrim Gozuacik ([dgozuacik@sabanciuniv.edu](mailto:dgozuacik@sabanciuniv.edu))

## Advisory Board Members



Sadık Esener  
Director, Nano-Tumor Center,  
University of California at San Diego



Mehmet Toner <https://hst.mit.edu/users/mehmettonerhms Harvard.edu>  
Professor of Bioengineering,  
Harvard Medical School



Yusuf Leblebici  
President,  
Sabanci University



Yoav Peles  
Mechanical Engineering Department Head,  
University of Central Florida



Pamir Alpay

Materials Science Engineering Department Head,  
University of Connecticut



Zahra Zakeri <http://biology.qc.cuny.edu/people/faculty/zahra-zakeri/>

President of International Cell Death Society,  
Queens College of the City University of New York

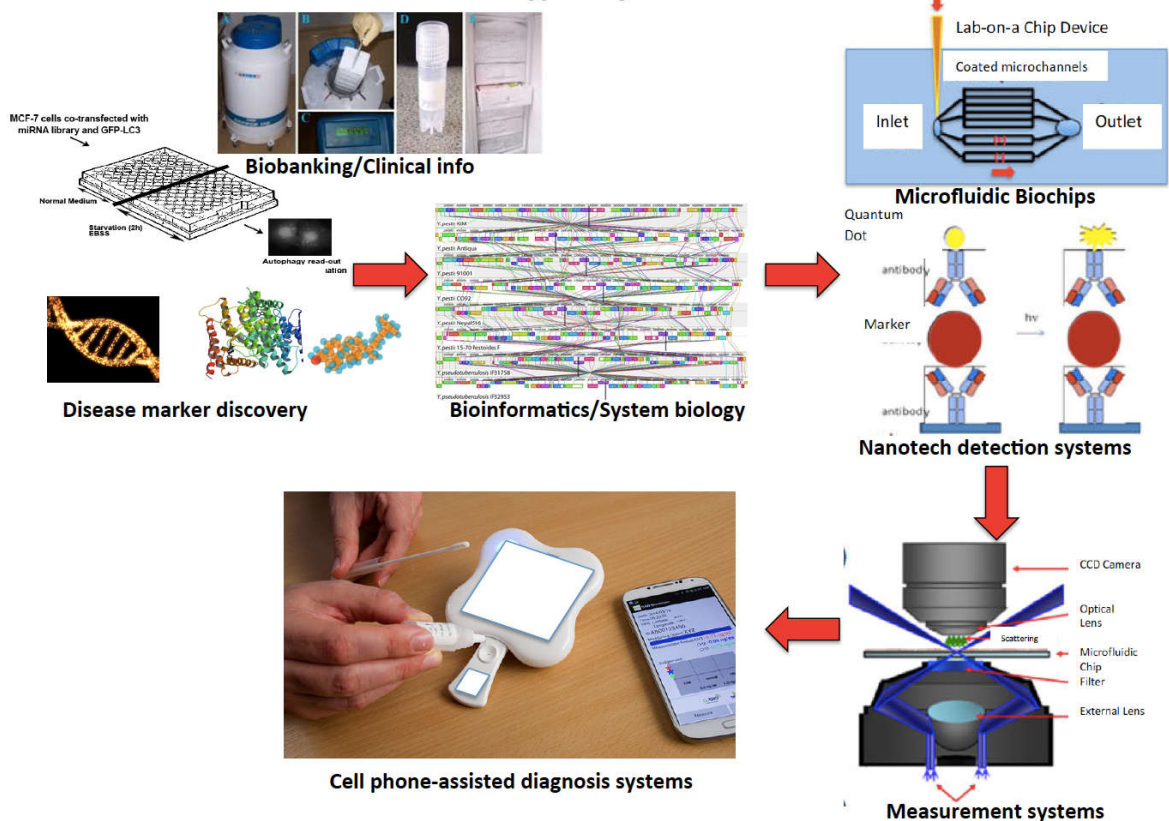


M. Pinar Mengüç

Director, Centre for Energy, Environment and Economy,  
Ozyegin University

## Research Activities in EFSUN

### EFSUN - Center of Excellence on Nano Diagnostics (<http://efsun.sabanciuniv.edu>) **Prototype Project Scheme**



The Prototype Project Scheme: Collaborative efforts of EFSUN Researchers who are experts in their respective fields, will allow creation of a cell phone-assisted platform for quick, cheap and accurate on-site detection and diagnosis of diseases. Clinical materials (tumors, various tissues, blood, urine, saliva etc) that are collected by clinical medical doctors, are analyzed using molecular tools (omics approaches, molecular biology, genetics, cell biology, biochemistry) and novel disease markers are discovered. Experts of bioinformatics and computational biology analyze the results of high-throughput omics approaches. Currently at least 5 protein and 5 RNA new and patentable markers of cancer were already discovered by EFSUN researchers, others are in the pipeline. Innovative microfluidic biochips are used in order to enrich, purify or separate cells and biomolecules in clinical materials. Using home-made antibodies, specially designed and functionalized nanoparticles and innovative physico-chemical detection approaches, EFSUN researchers are able to detect femto to subfemtomolar concentrations of disease markers. Signal detection is achieved using a home-made and patentable detection devices that process information in a cell phone and Cloud-assisted manner, and operating with a custom-designed application. Therefore, all components and parts of EFSUN Cell Phone-Assisted Diagnosis Systems are a result of cutting-edge science and technology.

*EFSUN Center of Excellence: Fascination of science and technology, excellence in surfaces , interfaces and diagnostics.*

## Members and Involved Institutions in EFSUN

### Sabancı University and SUNUM:



Ali Kosar



Burc Misirlioglu



Devrim Gozuacik



Kursat Sendur



Gozde Ince



Asif Sabanovic



Huveyda Basaga



Ozlem Kutlu





Murat Kaya Yapici



Feray Bakan



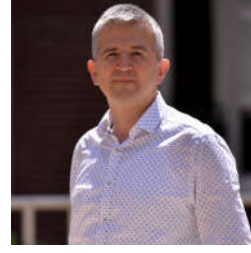
Meltem Sezen



Emre Erdem



Canan Atilgan



Fevzi akmak Cebeci

**Ko University:**



Havva Funda Yağcı Acar



Alper Kiraz

**Acibadem University:**



Işın Doğan-Ekici

**Hisar International Hospital:**



Sinan Ekici



Tunahan Cakir

**TÜBİTAK-MAM:**



Koray Balcioglu



Pinar Pir



Berrin Erdag



Saliha Durmuş

**Kültür University:**



Elif Damla Arısan



Nurcan Doğan

**TR Forensic Medicine Institution:**

**Gebze Technical University:**



Arzu Akcay



Serap Dokmeci (Emre)



Kubilay Kinoglu,



Filiz Kuralay

**Çukurova University:**



Hikmet Akkiz



Cenk Kig

**Marmara University:**



Tunc Lacin

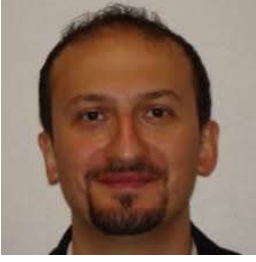
**Hacettepe University:**

**Middle East Technical University:**



Haluk Külâh

**Bahçeşehir University:**



Ozan Akdoğan

**Expertise Areas of EFSUN researchers**

**Surgery / Interventional Medicine:**



Hikmet Akkiz (Gastroenterology)



Kubilay Kinoglu (Forensic Medicine)

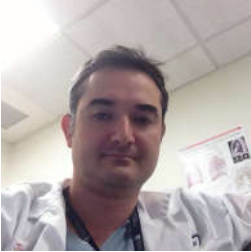


Sinan Ekici (Urology)

**Pathology:**



Işın Doğan Ekici (Clinical Pathology)



Tunc Lacin (Thoracic Surgery)



Arzu Akcay (Forensic Pathology)

Molecular Biology, Genetics, Biochemistry:



Devrim Gozuacik (Molecular Medicine, Cell Biology, Biochemistry)



Huveyda Basaga (Molecular Biology, Cell Biology)



Ozlem Kutlu (Molecular Biology and Genetics of Disease)



Serap Dokmeci (Medical Genetics)



Koray Balcioglu (Antibody Design and Production)



Berrin Erdag (Antibody Design and Production)



Cenk Kig (Cell Biology, Biochemistry)



Elif Damla Arisan (Molecular Cell Biology, Cancer Biology, Drug Resistance)

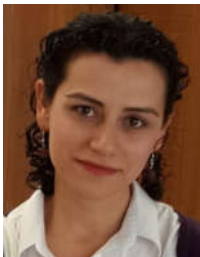
Bioinformatics and Computational Biology:



Tunahan Cakir (Systems Biology)



Pinar Pir (Systems Biology, Mathematical Modeling)



Saliha Durmuş (Systems Biology, Bioinformatics Tool Design)

Chemistry / Material Science:



Havva Funda Yagci Acar (Nano particle design)



Nurcan Doğan (Nano particle Design)



Gozde Ince (Polymers, Thin Films)



Emre Erdem (Physics of Materials, Thin Film Batteries)



Burc Misirlioglu (Interfaces, phase transitions, microstructural Properties)



Canan Atilgan (Polymers and Protein Dynamics)



Fevzi akmak Cebeci (Thin films, Polymers, Responsive nanocomposites)



Filiz Kuralay (Biosensors, Analytical Chemistry)



Ali Kosar (Microfluidics, Heat Transfer, Cavitation)



Kursat Sendur (Nano-optics, Plasmon Resonance, Electromagnetics)



Alper Kiraz (Optofluidics, Photonics, Single Molecule Microscopy)

Electrics /Electronics:



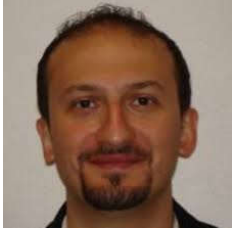
Murat Kaya Yapici (Microelectromechanical Systems)



Asif Sabanovic (Robotics, Control, Micromanipulation)



Haluk Klah (Microelectromechanical Systems)



Ozan Akdođan (Magnetic Materials,  
Microelectromechanical Systems)



## Publications:

- 1- Aghdam, A.K., Ghorbani, M., Deprem, G., Cebeci, F.C., and Koşar, A., " A New Method for Intense Cavitation Bubble Generation on Layer-by-Layer Assembled SLIPS," Scientific Reports, 9, 11600, 2019.
- 2- Akkoc Y and Gozuacik D. MicroRNAs and autophagy. Biochimica Biophysica Acta (BBA)-Molecular Cell Research, 2019.
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- 62- Yayla, M., Cadirci, E., Halici, Z., Bakan, F., Ay, N., Demirci, S., Karaman , A., Sahin, F. 2020. "Regenerative Effect of Resorbable Scaffold Embedded Boron-Nitride/Hydroxyapatite Nanoparticles in Rat Parietal Bone", Journal of Nanoscience and Nanotechnology, Volume 20, Number 2, February 2020, pp. 680-691(12). DOI: <https://doi.org/10.1166/jnn.2020.17128>.
- 63- Zuvin M, Kuruoglu E, Kaya VO, Unal O, Kutlu O, Yagci Acar H, Gozuacik D, Kosar A. Magnetofection of Green Fluorescent Protein Encoding DNA-Bearing Polyethyleneimine-Coated

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## Patents:

### Granted Patents:

- 1- Koşar, A., Sendur, K., and Menguc, M. P., "Flow System Avoiding Particle Agglomeration," International Patent. EP3365627 B1.
- 2- Kosar, A., Perk, O.Y., "Pharmaceutical Drug Delivery System," International Patent. EP2918263 B1.
- 3- Kosar, A., "Hidrokinamik Kavitasyon Esaslı Mikrokarıştırıcı," National Patent. TR2016 02562 A2.

### Patent Applications:

- 1) Akdoğan, O., Fe<sub>16</sub>N<sub>2</sub> tabanlı kalıcı mıknatıs üretimi, National Patent.
- 2) Akdoğan O., Ultraviyole (UV) ışın etkisi ile hızla küreleşebilme özelliğine sahip polimerik bir malzeme, National Patent.
- 3) Akgonul S, Zuvın M, Sevgen Mİ, Kosar A, Gozuacik D; Kutlu O, Yagci-Acar H. Rotary Magnetic Actuation System. WIPO-Patent Cooperation Treaty. Application Number: PCT/TR2019/050115. February 20, 2019. Pending.
- 4) Gozuacik D, Kutlu O, Akkoc Y, Akkiz H. Interleukin as a novel biomarker and drug target in fatal liver cancer. WIPO-Patent Cooperation Treaty. Application phase.
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- 6) Kosar A., Kaya, I.I., Sadaghiani, A.K., Tastan, U., Apak, A.M., Boncu, M., Parlak, M., Apak, A., New Generation Vapor Chamber. International Patent. Pending.
- 7) Kosar A., Gevari, M.T., Ghorbani, M., Atalay, I.C., Energy Harvesting for Electric Vehicles. International Patent. Pending.
- 8) Yerlikaya, P.O., Arısan, E.D., Gürkan, A.Ç., Ünsal, N.P., "Epibrassinolid (EBR) içeren farmasötik bir bileşim", Patent Kategorisi: Section A-Human Necessities, Patent sınıfı: A01K67/027, Patent başvuru no: 2019/13371

- 9) Yerlikaya, P.O., Arisan, E.D., Gürkan, A.Ç., Ünsal, N.P., “Epibrassinolid (EBR) ve roskovitin (ROSC) içeren farmasötik bir bileşim”, Patent Kategorisi: Section A-Human Necessities, Patent sınıfı: A01K67/027, Patent başvuru no: 2019/13373

### Ongoing Projects:

- TÜBİTAK 1001 ‘Development and Fabrication of Ferroelectric Polymer Thin Films with Multilayers and Gradient Compositions for Improved Control of their Dielectric Properties’, 2017-2019
- TÜBİTAK 2232 International Fellowship for Outstanding Researchers Programme, Budget: 2.770.000 TL, 2019-2022
- TÜBİTAK 1001- İktiyoz Hastalığında Yağ Damlacıkları Yıkım Mekanizmalarının Birbirleri ile Etkileşimlerinin Moleküler Düzeyde Araştırılması-2019-2021
- Project Title: Glutamate Oxaloacetate Transaminase Nanoparticles targeted to the Brain for Neuroprotection in Ischemic Stroke\*. Starting Year: Jan. 2020. Duration: 36 months. Role: Turkish Principal Investigator (PI). Funders: EuroNanoMed-III. Total Budget: 1.020.000 TL.
- Project Title: Investigation of the role of a colorectal cancer-associated microRNA in cancer formation and progression using cellular models\*. Starting Year: Jan. 2020. Duration: 36 months. Role: Principal Investigator (PI). Funders: TUBITAK. Project Code: 1001. Total Budget: 1.000.000 TL (175,438 USD).
- Project Title: Development of Integrated microRNA Biosensor Chips for Early Diagnosis of Cancer\*. Starting Year: Jan. 2020. Duration: 36 months. Role: Advisor. Funders: TUBITAK. Project Code: 1003. Total Budget: 2,477,486 TL (434,646 USD).
- TÜBİTAK 1001 ‘Investigation of links and crosstalk between autophagy and stress responses’, 2017-2020
- TÜBİTAK (Korea Bilateral Cooperation Program Support, ‘Turkey-Korean international collaboration on the controlled bubble dynamics in magnetic nanofluids for the heat transfer enhancement ‘2017-2019
- TÜBİTAK (British Council Bilateral Newton Katip Celebi Cooperation Program Support) ‘Evaporated drop analysis, 2017-2019
- TÜBİTAK 1003 ‘Bioinformatic analysis of transcriptome data and cellular networks for Parkinson’s Disease: Identification of novel drug targets and drugs’, 2017-2020,(Project Code: 315S302)
- TÜBİTAK 1003 ‘Non-small cell lung cancer, investigation of its pathogenesis via omics approaches’, 2017-2020
- TÜBİTAK 1001 Bilateral Cooperation Project with Pakistan, ‘Constraint-based and Structure-based Analysis of Metabolic Pathways to Identify Potential Drug Targets against the Lethal Infectious Diseases originating from K. pneumoniae and S. enterica’ 2017-2020
- TÜBİTAK 1001 ‘The synthesis of GHRH blocking aptamers through SELEX method and characterization biological effect of selected aptamers in prostate, breast, colon and cervical cells’, 2017-2020
- TÜBİTAK 1001 ‘Targeting AMPKa with orlistat through 2D-DIGE method in PC3 and PNT1A prostate cancer cells’
- TÜBİTAK European Molecular Biology Organization (EMBO) Networking Grant for COST-GENIE BM1408

- TÜBİTAK 1001 'The investigation of epibrassinolide-induced cell death mechanism related to ER stress in colon cancer cells'
- TÜBİTAK 1001 'The therapeutic efficiency of Curcumin related to autocrine growth hormone signaling cascade in different breast cancer cells'
- TÜBİTAK 1001, "Dielektrik özelliklerin kontrolü amacıyla Bileşim Gradyanlı ve Çok Katmanlı Ferroelektrik Polimer İnce Filmlerin Tasarımı ve Üretimi"
- TÜBİTAK 3501 Kariyer Geliştirme Projesi, Katı Oksit Yakıt Hücrelerinde Nanokompozit Katot Mikroyapısının Elektrokimyasal Performansa Etkisinin Araştırılması
- TÜBİTAK 1003 Öncelikli Alanlar Projesi, Düşük Sıcaklıkta Yüksek Performans ve Kararlılıkta Çalışan Katı Oksit Yakıt Hücrelerinin Geliştirilmesi
- TÜBİTAK 1001, Creation of non-small cell lung cancer models and investigation of its etiopathogenesis using omics methods.
- TÜBİTAK 1001, Investigation of connections and crosstalk between autophagy and DNA damage responses.
- TÜBİTAK 1005, Dolaşımdaki Tümör Hücrelerinin Etkin Ayrıştırılmasına Yönelik Hibrit Yapıda Bir Biyosensör Çipi Geliştirilmesi
- "Çoklu Biyobelirteçlerin algılanmasına yönelik moleküler baskılanmış iletken polimer nanotüplerin üretimi ve nanotüp entegre sensör geliştirilmesi", Tübitak ARDEB 1001 (2019-2021)
- TÜBİTAK 3001, Farklı Geometrik Ve Yüzey Özelliklerine Sahip Kavite Akışının Karakterizasyonunda Kullanılan Mikro/Nanoakışkan Cihaz
- TÜBİTAK 1003, Hidrodinamik Kaviteye Dayanan Medikal Uygulamalar İçin Kullanılacak Ulusal Endoskopik Cihaz Prototipinin Ürüne Dönüştürülmesi
- Sabancı University Internal Research Project, Energy Harvesting in Small Scale with Small Bubble Collapse and Blast for Fulfilment of Personal Energy Need (01.09.2018- 01.09.2019)
- Cukurova University SRP. Discovery of tumor-stroma crosstalk mediators in hepatocellular carcinoma.
- Su-GTU Bilateral . Structural and Chemical Analysis of Nanostructured Solid Oxide Fuel Cell Electrodes (01.01.2017- 01.01.2018), Sabancı University Internal Research Project –
- Royal Academy of Engineering, 'Multiphase Flows and Heat Transfer in Micro scale'
- TEYDEB-1505, İsi Değiştirgeçleri İçin Biyokaplamalar Geliştirilmesi Fizibilite Çalışması,(2018-2019)
- TÜBİTAK 1001: Pankreas Kanseri Hücre Hatlarında CDK 4/6 İnhibitörleri Palbociclib ve Abemaciclib'in AMPK'nın Etkileşimde Olduğunu Üst ve Alt Sinyal Yolakları İlişkili Global Protein ve Lipid Profilleri Üzerine Etkilerinin Araştırılması (TÜBİTAK-1001- Proje No: 118Z100, 02/11/2018-2/11/2021, Yürütücü)
- TÜBİTAK 1001: SELEX Yöntemi ile Büyüme Hormonu Salgılatıcı Hormon (Ghrh) Sinyalini Engelleyen Aptamerlerin Sentezi, Karakterize Edilmesi, Anti-Proliferatif, Anti-Karsinogenik Etkisinin Prostat, Meme, Kolon ve Servikal Kanseri Hücrelerinde İrdelenmesi" (TÜBİTAK-1001-Proje No: 117Z254-2018-2021-Danışman).
- Atatürk Üniversitesi, BAP Projesi, Proje no 6525. Kemik Defekt Tedavilerinde Kullanılacak İdeal Biyobozunurluk ve Yüksek Mukavemet Sergileyen Biyobozunur Nanokompozitlerin Geliştirilmesi ve İn Vitro Karakterizasyon Çalışmaları.
- Medeniyet Üniversitesi BAP Projesi. Proje no T-GAP-2018-1351 (Araştırmacı). Üriner Sistem Taş Hastalığında Üriner Mikrobiyomun Yeri.
- Tübitak 3501 - Enerji Ve Otomotiv Sektöründe Kullanılmak Üzere Yeni Nesil Lantanit İçermeyen Fe16n2 Kalıcı Miknatıs Sentezi -350000₺
- Uluslararası (Tübitak-Fransa işbirliği) - Serbest Elektron Lazeri İçin Milim Altı Periyotlu Salındırıcı Tasarım ve Üretimi- 500000₺
- COST CA16120 (EPITRAN) 29/03/2017 - 28/03/2021 - Katılım tarihi: 20/09/2017



- TÜBİTAK ARDEB 1003 216S489 (Araştırmacı) - Küçük Hücreli Dışı Akciger Kanseri Uyku Hali (Dormancy) Modelleri Oluşturulması Ve Etiyopatogenezinin Omik Yöntemlerle Araştırılması - 1/12/2017 - 1/12/2020 - Butce 2.178.730
- TÜBİTAK ARDEB 1001 116S388 (Yürütücü) - Uyarılmış Kök Hücrelerin Oluşum ve Baskalaşım Süreçlerinin Sistem Biyolojisi ve Biyomühendislik Yaklaşımlarıyla Modellenerek Geliştirilmesi - 01/05/2017-01/05/2020 - Bütçe 335.200
- TÜBİTAK 1001 "Development of Nanomotors for Breast Cancer Detection and Therapy" TUBITAK (KBAG), 1001-Project Number: 116Z503, Principal Investigator (Total Funding: 414.825,00 TL, 30 months).
- United States Air Force Office of Scientific Research "Investigation of the effect of crystallographic anisotropy and defects on the electrocaloric response of stress-free relaxor ferroelectric plates by experimental and analytical techniques" granted by the United States Air Force Office of Scientific Research (USAF AFOSR) in May of 2018 (budget: 210000 USD for 3 years), active as of July of 2018.
- TUBITAK 1001 Project, active as of October of 2017: "Control of magnetic orientation and electroresistance of nano structures with vortex magnetism", (total budget granted: 120000 USD).
- TUBITAK 1001 Project, active as of April 2017: "Development of a non-destructive and low power read-out ferroelectric memory using a multilayered approach", (total budget granted: 120000 USD).
- TUBITAK 1002-Kemik Destek Materyali Olarak Fosfolipid İle Stabilize-selenyum Nanopartiküllerle İyileştirilmiş Kemik Çimentoları, 118S723 (2019-2020)

## EVENTS

- Project Team Building Event (04.02.2017)
- General Meeting and Iftar Dinner (20.06.2017)
- The 'Functional Surfaces and Interfaces Workshop' of EFSUN on the 25th November 2017:  
<https://efsun.sabanciuniv.edu/functional-surfaces-and-interfaces-workshop-was-held-sabanci-university-sunum>
- Some high impact research outputs in 2017-2018:  
Ozturk DG, Kocak M , Akcay A, Kinoglu K, Kara E, Buyuk Y, Kazan H and Gozuacik D. MITF/MIR211 axis is a novel autophagy amplifier system during cellular stress. *Autophagy*, 2018.  
O. Mohammadmoradi, C. Sen, G. A. Ibanescu, L. Pintilie and I. B. Misirlioglu, "Strong composition dependence of resistive switching in Ba<sub>1-x</sub>Sr<sub>x</sub>TiO<sub>3</sub> thin films on semiconducting substrates and its thermodynamic analysis", *Acta Materialia*, 2018.  
Ghorbani, M. Chen, H., Villanueva, L.G., Grishenkov, D. and Koşar, A., "Intensifying Cavitating Flows in Microfluidic Devices with Poly(vinyl alcohol) (PVA) Microbubbles," *Physics of Fluids*, 2018, 30(10).  
Motezakker, A.R, Sadaghiani, A.K., Akkoç, Y. Parapari, S.S., Gozaucik, D., and Kosar, A.," Surface modifications for phase change cooling applications via crenarchaeon *Sulfolobus solfataricus* P2 bio-coatings," *Scientific Reports*, 7, Article number: 17891, 2017.
- Some accomplishments:  
Devrim Gozuacik will serve as an International Board Member of an NIH-Supported Center of Excellence  
Ali Kosar has been named a top reviewer in Publons' global Peer Review Awards.  
SUTAB team receives the METU (Middle East Technical University) Prof. Mustafa N. Parlar Foundation 2017 Technology Incentive

[https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun\\_catalogue-2018\\_0.pdf](https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun_catalogue-2018_0.pdf)Award.

Tunahan Çakır receives the METU (Middle East Technical University) Prof. Mustafa N. Parlar Foundation 2017 Technology Incentive Award.

Authors of the article in the 50 Most Downloaded Articles List in the IEEE Reviews in Biomedical Engineering

- EFSUN and SUNUM will organize an Applied Winter School for High School students between 28 January and 1 February 2019:  
[https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/fvs\\_sunum-efsun-uygulamali\\_nanoteknoloji\\_lise\\_kis\\_okulu-detayli\\_program\\_finalv2.pdf](https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/fvs_sunum-efsun-uygulamali_nanoteknoloji_lise_kis_okulu-detayli_program_finalv2.pdf)
- 2018 Research Catalog of the Center is available:  
[https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun\\_catalogue-2018\\_0.pdf](https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun_catalogue-2018_0.pdf)
- EFSUN members had the general meeting and traditional Iftar dinner on the 17.05.2018 with the participations of Prof. Dr. Sirin Tekinay and Prof. Dr. Fazilet Vardar
- EFSUN team had a Brain Storming Event on the 17th February 2018 and on the 1st September 2018
- The Research Catalog of 2018 is available:  
[https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun\\_catalogue-2018\\_0.pdf](https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun_catalogue-2018_0.pdf)
- The Activity Report of 2017-2018 is available:  
[https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun\\_activity\\_report\\_2017-2018.pdf](https://efsun.sabanciuniv.edu/sites/efsun.sabanciuniv.edu/files/efsun_activity_report_2017-2018.pdf)

- The Winter Nanotechnology School for High School Students was held between 28 January and 1 February 2019 in cooperation with Sabancı University SUNUM and EFSUN Centers.:  
<https://efsun.sabanciuniv.edu/content/winter-nanotechnology-school-high-school>
- EFSUN organized The Functional Surfaces and Interfaces for Nano diagnostics Workshop and Best Paper Award on the 19th June 2019  
<https://efsun.sabanciuniv.edu/news/functional-surfaces-and-interfaces-nano-diagnostics-workshop-and-best-paper-award>







## Job Openings

- EFSUN invites applications for Ph.D. students, post-doctoral positions and technical staff.
- Candidates having experience on biology of diseases, microfluidics/nanofluidics, material fundamentals, surface and interface interactions, energy harvesting along with targeted device design are welcome.
- Please send a curriculum vitae, publication list, names and e-mail addresses of at least three referees and a motivation letter electronically to:

Professor Ali Kosar ([kosara@sabanciuniv.edu](mailto:kosara@sabanciuniv.edu))

Professor Burc Misirlioglu, ([burc@sabanciuniv.edu](mailto:burc@sabanciuniv.edu))

Professor Devrim Gozuacik ([dgozuacik@sabanciuniv.edu](mailto:dgozuacik@sabanciuniv.edu))