ODTÜ

AdımODTÜ UNDERGRADUATE RESEARCH PROJECT

Examples of Undergraduate Research Projects supported by AdımODTÜ in 2019

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A joint project of the Corporate Communications Office and METU Development Foundation, AdımODTÜ is a communication-sharing-action platform where everyone can provide financial support to the scientific research and community service projects of our students and faculty members, contribute to the announcement of the projects and even take part in projects on a voluntary basis.

Research at METU starts in undergraduate years!

AdımODTÜ has created a fund to support the research efforts of undergraduate students through donations. In this booklet, examples of undergraduate projects that have applied to AdımODTÜ are presented. These projects are either fully or partially supported by AdımODTÜ.

To support AdımODTÜ Undergraduate Research Project please visit:
https://adimodtu.org.tr/proje/lisans-arastirmalari-projesi

Name of the Project: Alternative Energy Vehicle "Air-Core Electric Motor"

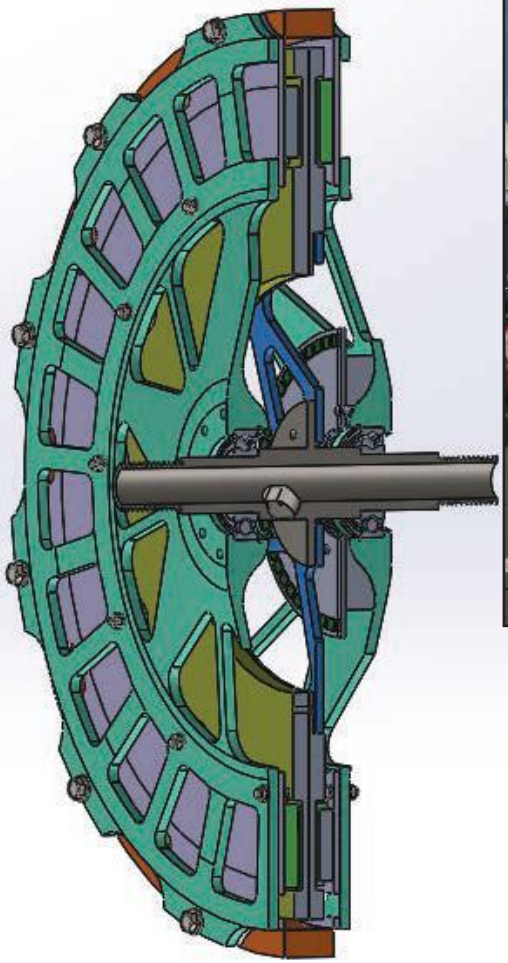
Field of Research: Mechanical Engineering

Project Team Members: Huzeyfe Şirin, Erkin Filiz, Kafkan Fenerli, Eminalp Koyuncu, Emre Durna, Mehmet Furkan Doğan, Anıl Ayöz, Hürkan Dere, Metin Deniz Yıldız, Ufuk Can Karataş, Utku Ertürkan, Elif Pınar, Mustafa Akbaba, Emre Dağ, Egemen İlikmen, Yalın Şahin, Göktuğ Tonay, Özgür Gülsuna, Ahmet Utku Özkan and Oğuz Yorgancılar

Project Advisor: Prof. Dr. Erhan İlhan Konukseven

Abstract:

METU-CET has been designing and producing Alternative Energy Cars and systems for their cars since 2005. Alternative sources will be the future of the energy. Electric cars are becoming popular and they need more efficient systems to sustain more range with less energy consumption. Electric Motors have been using for higher efficiency. Therefore, Air-core electric motors have more efficiency rather than axial flux electric motors. Our team designed new type of electric motor which known as coreless electric motor and produced three phase air-core electric motor to use on our electric cars to aim to break efficiency record in 2020 TÜBİTAK Efficiency Challenge and Shell Eco-Marathon.



Air-Core Electric Motor

Name of the Project: An Experimental Analysis of Gravitational Waves by Using Sound Waves

Field of Research: Gravitational-wave Astronomy

Project Team Member: Berke Kocaoğlu

Project Supervisor: AdımODTÜ

Abstract:

Gravitational waves are disturbances in the curvature of spacetime that propagate at the speed of light. They contract and expand masses that they pass through, altering with their dimensions. The effects on Earth are smaller than the size of a proton; therefore, gravitational-wave observatories use interferometers with kilometres long arms such that even the subtlest changes get amplified, but this also means that the equipment is prone to the smallest vibrations nearby. One of the counter-measures is to analyse the data thoroughly using a supercomputer. However, numerical relativistic calculations and template-fitting take too long even on supercomputers. This project aims to reduce computation times by utilising machine learning for a neural network to identify gravitational-wave strain, aiding usual computations. After training the network with data that was obtained by impressing sound waves upon a Michelson interferometer, it was tested on real gravitational-wave data. It currently proves to be ineffective, but development is in progress.

An Experimental Analysis of Gravitational Waves by Using Sound Waves

Name of the Project: Biogas Production from Waste Biomass

Field of Research: Renewable Energy

Project Team Members: Yasin Odabaş, Göksu Özal, Doğa Yahşi and Furkan Saraç

Project Supervisor: Assist. Prof. Dr. Yasemin Dilşad Yılmazel

Abstract:

Abstract: In order to protect the environment from adverse effects of fossil fuels, to provide adequate amount of energy, and to manage organic wastes properly, the concept of renewable energy should be taken into consideration. Biogas production is one of the main methods of renewable energy. In this study, biogas production from cow manure through anaerobic digestion was investigated with different sets. In the first and second set, we studied the pretreatment effect on biogas production with two different inoculums, wastewater treatment plant sludge, and biogas plant effluent. In the third set, the effect of activated carbon on biogas production was examined, and the effect of higher F/M ratios on biogas production was studied with different pretreatments in the last set. In the third set, GAC increased biogas production with 148%. The maximum cumulative amounts of methane and hydrogen produced were 91.7 mL and 14.2 mL, respectively in the reactor with no pretreatment and F/M ratio of 5 in the last set.

Biogas Production from Waste Biomass

Name of the Project: CANSAT (Can sized Satellite)

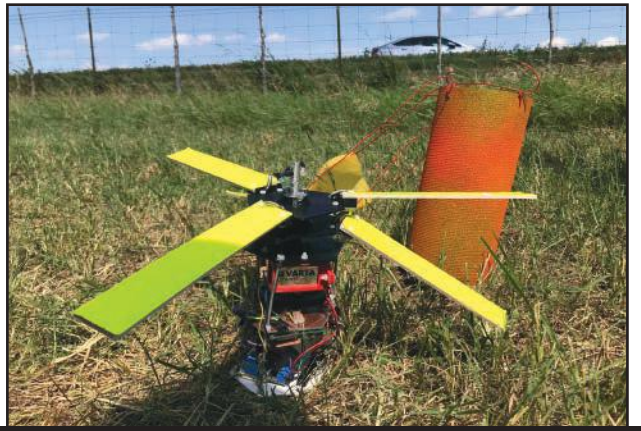
Field of Research: Design, Aerodynamics, Manufacturing, Communication

Project Team Members: Mücahit Taşdemir, Tahir Yanık, Muhammed Asif Saeed, Fatih Çalış, Huzeyfe Hintoğlu, Recep Günay, Fatih Turgel, Kamil Canberk Atik and Fatih Çam

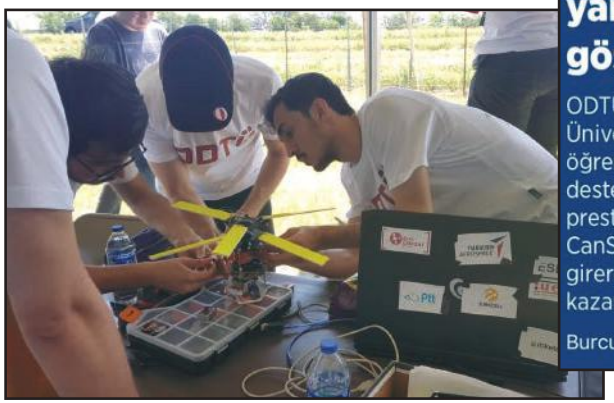
Project Supervisor: Prof. Dr. Ozan Tekinalp

Abstract:

The aim of this project is to design, build and launch a very small satellite composed of science payload and container. The flight mission of the satellite is divided three stages. The first stage is to calibrate the IMU and launch the satellite through a small rocket. The second stage is deployment and descend to 450 meters using a parachute at specified speed. Then, science payload should be deployed, and passive descend mechanism (auto-gyro) should keep the payload descending at specified speed range. Ground station should communicate with the satellite and plot the data real time during all the stages. Project includes all the design, production, testing and launching phases.



CANSAT (Can sized Satellite)



Türk uyduları NASA'nın yarışmasında boy gösterecek

ODTÜ, Çankaya ve Başkent Üniversitelerinin mühendislik bölümü öğrencileri, NASA tarafından desteklenen dünya çapındaki en prestijli model uydu yarışması CanSat'ta ilk 40 üniversite arasına girerek Türkiye'yi temsil etme hakkı kazandı.

Burcu Çalık,Selma Kasap | 21.03.2019

Name of the Project: Conservation and Assessment of Honey Bee Populations in Turkey

Field of Research: Honeybee Molecular Phylogeography

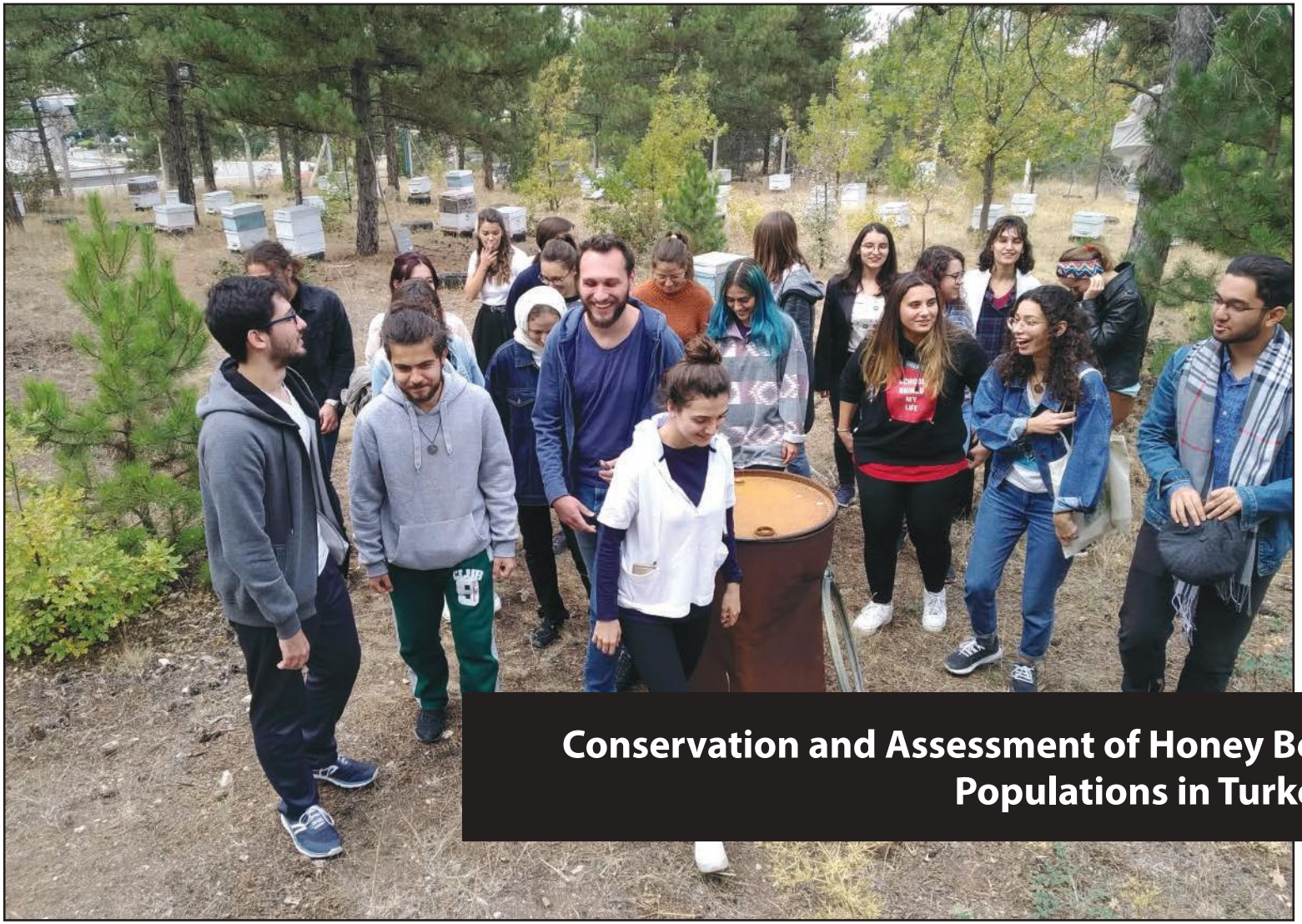
Project Team Members: Atilla Çelikgil, Şevval Demirci, Selen Akçakoca and Mert Kükrer

Project Supervisor: Prof. Dr. C. Can Bilgin

Abstract:

The honey bee (Apis mellifera L.) is a globally significant species of apparent economic and ecological importance due to their pollination services and bee products. Past research revealed the presence of five different subspecies of honey bees in Turkey. Here, we conducted an analysis of population structure of honey bees sampled from 27 provinces (n = 245).

Structure analysis, PCA and the phylogenetic tree obtained revealed four different clusters corresponding to geographical distributions of four subspecies. According to that: Thracian populations diverged first and they tend to group with commercial European samples indicating natural genetic contribution from the Balkans into that gene pool; Anatolian populations can be considered as a melting pot of several lineages; Levantine populations appear more distinct than the rest indicating possible gene flow from Middle East and North Africa; Caucasian introgression to other populations due to queen and colony trade or migratory beekeeping practices is evident.



Conservation and Assessment of Honey Bee Populations in Turkey

Name of the Project: Deep Learning-based High Quality Microwave Imaging

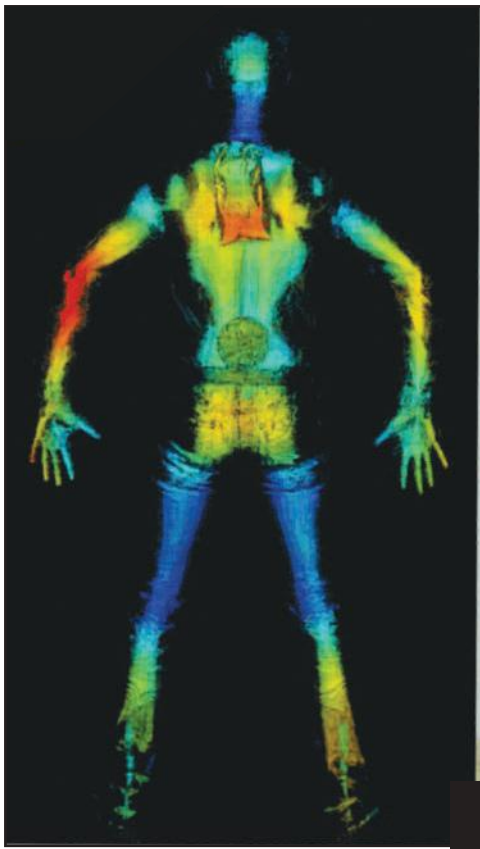
Field of Research: Electrical Engineering - Signal Processing

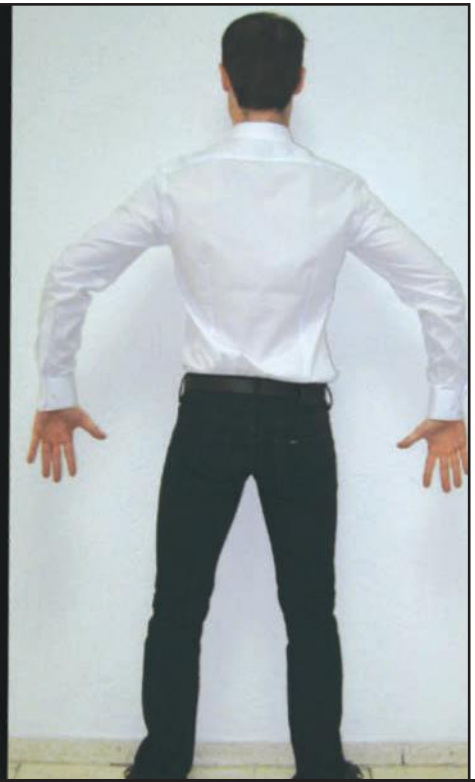
Project Team Members: Gizem Yüce, Batu Mehmet Öztürkler and Ege Özsar

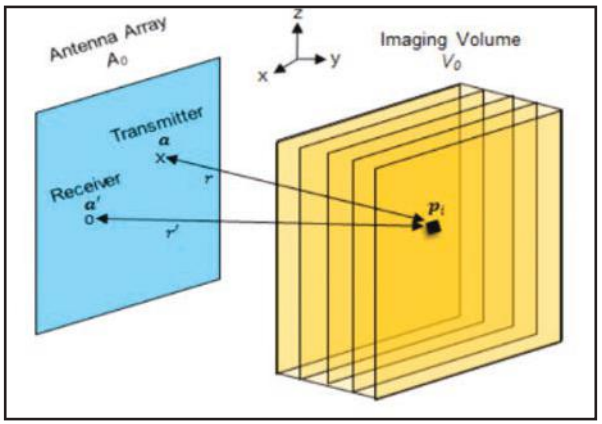
Project Supervisor: Assist. Prof. Dr. Sevinç Figen Öktem

Abstract:

Near-field microwave imaging systems are recently used in various applications including airport security, surveillance, through-wall imaging and medical diagnosis. The successful operation of such systems depends on the quality of the images reconstructed from the acquired radar data. To enable high-quality imaging, in this project, we develop an image reconstruction method that exploits deep learning. A recent trend in inverse problems in imaging is utilizing deep learning methods, which not only provide superior results compared to the conventional methods, but also offer real-time imaging capability. By developing a novel deep learning-based image reconstruction method, the project aims to achieve these for near-field microwave imaging.







Deep Learning-based High Quality Microwave Imaging

Name of the Project: Design of Bio-Fuel Producing Bacteria

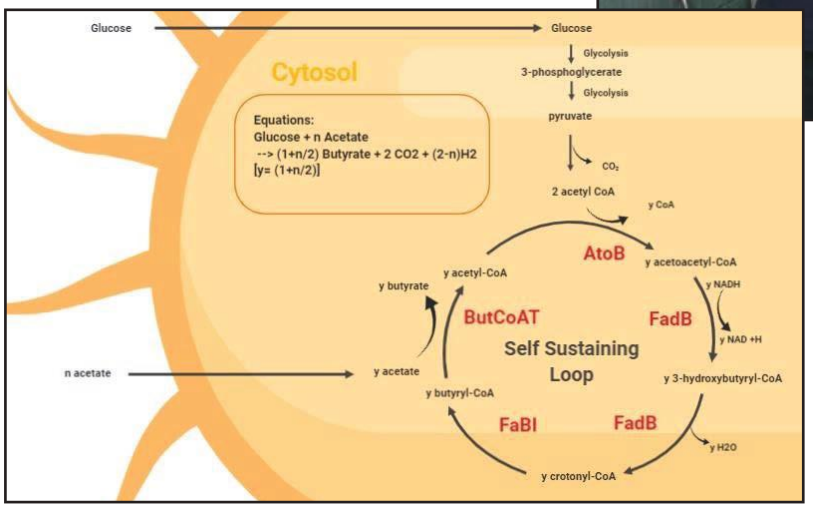
Field of Research: Molecular Biology and Genetics

Project Team Members: M. Erdem Ercan and C. Burak Kızıl

Project Supervisor: Prof. Dr. Sreeparna Banerjee

Abstract:

Short chain fatty acids (SCFA, C<6) are of high interest for their industrial value as biofuels and as therapeutic agents via the epigenetic regulation of gene expression and as cell proliferation inhibitors. Industrial SCFA production relies on finite resources such as petroleum; therefore, production from biological sources such as bacteria is of high economical value. Methods for the bio-production of SCFA include modulation of phospholipid biosynthesis, reversal of β-oxidation and fermentation. In our study we combined fermentation with reversed β-oxidation for the production of butyrate. We report that overexpression of ButCoAT, an enzyme important for butyrate synthesis, and β-oxidation reversal enzymes in commensal bacteria resulted in up to 3- fold higher production of SCFA compared to controls. Incubation of epithelial cells with the secretome of these bacteria resulted in reduced cell viability and activation of signal transduction. These modified bacteria may valuable for the production of both biofuels and beneficial probiotics.



Design of Bio-Fuel Producing Bacteria

Name of the Project: Detection of Circulating Tumor Cells with Aptamers

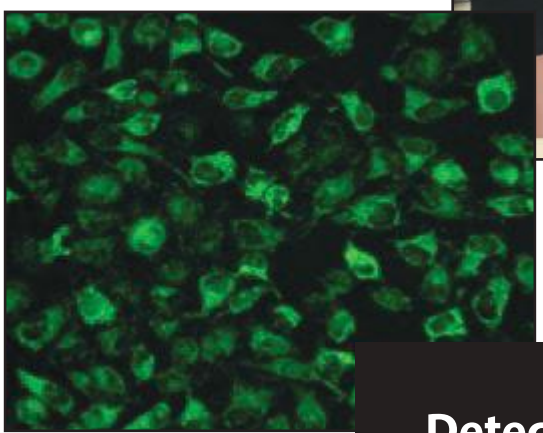
Field of Research: Aptamer Diagnostics

Project Team Members: Rojbin El, Rezzan Fazlıoğlu and Meriç Öztürk

Project Supervisor: Assist. Prof. Dr. Müslüm İlgü

Abstract:

Aptamers are small nucleic acids binding to their targets with a high specificity and affinity. They are easily selected for a target molecule and can be modified to enhance their stability without any loss of affinity. These properties of aptamers make them suitable for incorporation with biosensor platforms as detecting molecules; so they have been used for the development of aptasensors to detect a variety of molecules; such as proteins. Circulating Tumor Cells (CTCs) in the blood of cancer patients are regarded as potential metastatic seeds; so their capture and detailed characterization hold great promises. Therefore, developing sensors to detect CTCs might be utilized to achieve accurate prognosis, better diagnosis and prevention of metastasis. Aim of this study is to develop an electrochemical aptasensor binding to EpCAM / MUC1 surface biomarkers in cancer cells. It is aimed to develop a more efficient and cheaper diagnostic tool alternative to other tools.



Detection of Circulating Tumor Cells with Aptamers

Name of the Project: GPx2: A Novel Player in Ferroptosis

Field of Research: Cancer Biology; Cell Death

Project Team Members: Serena Mahnoor and Hoşnaz Tuğral

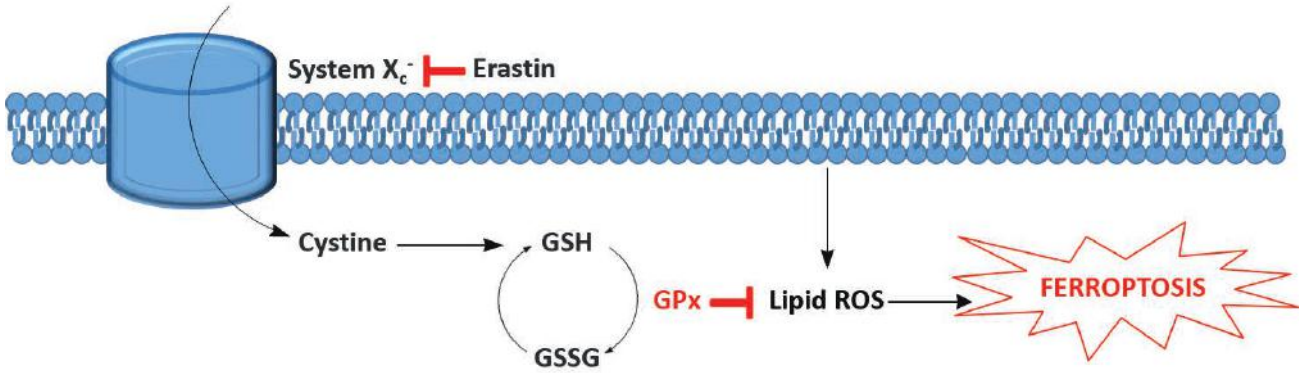
Project Supervisor: Prof. Dr. Sreeparna Banerjee

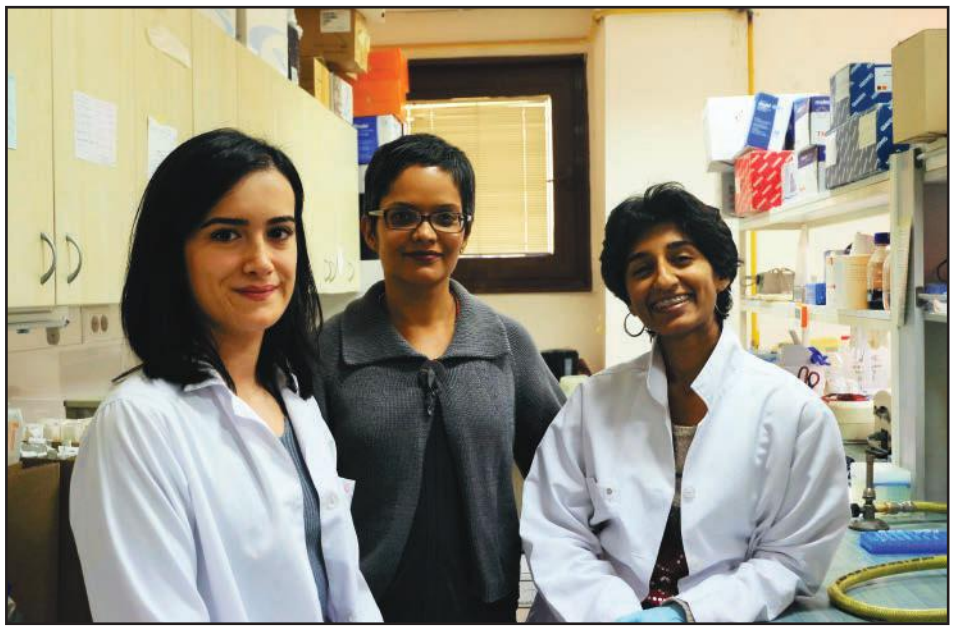
Abstract:

Ferroptosis is a recently described form of regulated cell death that is distinct from apoptosis. Ferroptotic cell death results from the catastrophic accumulation of lipid reactive oxygen species (ROS). Inhibition of ferroptotic cell death is strongly implicated in cancer progression; however, its mechanisms are still unclear. At the centre of the ferroptosis pathway is a peroxidase enzyme called GPx4, which can reduce the lipid ROS. Based on bioinformatics analysis of publically available breast cancer transcriptomic and metabolomic data (1), a different GPx isozyme- GPx2 was found to be positively correlated with the levels of ferroptosis related metabolites. To confirm this finding, we manipulated GPx2 levels in MDA-MB-231 cells and treated them with the ferroptosis inducer Erastin to observe a change in sensitivity towards ferroptosis. Activation of ferroptotic cell death has great potential for cancer therapy; our research will contribute to the better understanding of this pathway.

Reference:

(1) Terunuma et al. MYC-driven accumulation of 2-hydroxyglutarate is associated with breast cancer prognosis, J Clin Invest. 2014;124(1):398–412. doi:10.1172/JCI71180.





GPx2: A Novel Player in Ferroptosis

Name of the Project: How Masculinity Manifests in Different Academic Disciplines: An Inter&Intra-Faculty Examination

Field of Research: Social Sciences

Project Team Members: Mine Özer, Selin Kumbaracı and Öykü Özfırat

Supervisor: Dr. Kürşat Çınar

Abstract:

It is quite clear to see that there is not a singular understanding of masculinity nor is there a static one, with each society having its own set of values, patterns, and beliefs. Therefore, due to this fluidity of the general term of 'masculinity', it is not possible to integrate one set definition of it into different social fields. Furthermore, considering the differences within and amongst various academic fields in terms of the aforementioned values, patterns, and beliefs, an examination of masculinity is needed throughout various disciplines, particularly from the view of male students.

How Masculinity Manifests in Different Academic Disciplines: An

Name of the Project: Metu Formula Racing

Field of Research: Mechanical Engineering

Project Team Members: Team contains over 60 students

Project Supervisor: Assist. Prof. Dr. Ahmet Buğra Koku

Abstract:

METU Formula Racing is the Formul SAE team of Middle East Technical University. The 2015-2016 team made up of 5 students, but now, 2019-2020 team has 60 students plethora of majors. At the beginning of the September, the team starts to research, design and analyse the concepts. During the month of January, team members forego their winter breaks to stay in METU to manufacture the car and prepare for the upcoming competitions. Even after competition, several members of the team remain on campus for the summer to plan for the following season.

Metu Formula Racing

Name of the Project: Monitoring the Cell Cycle Dependent CXXC5 Synthesis

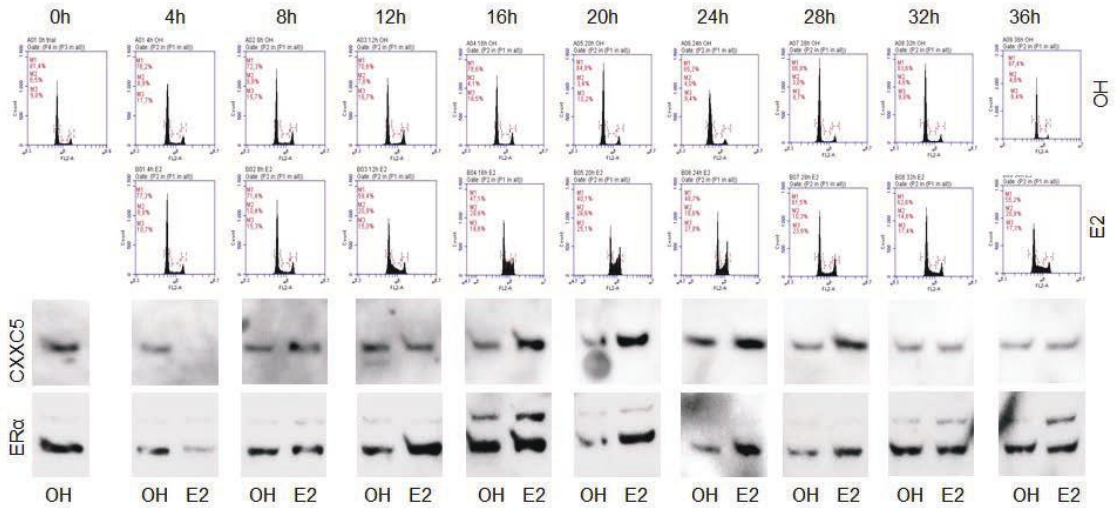
Field of Research: Biology

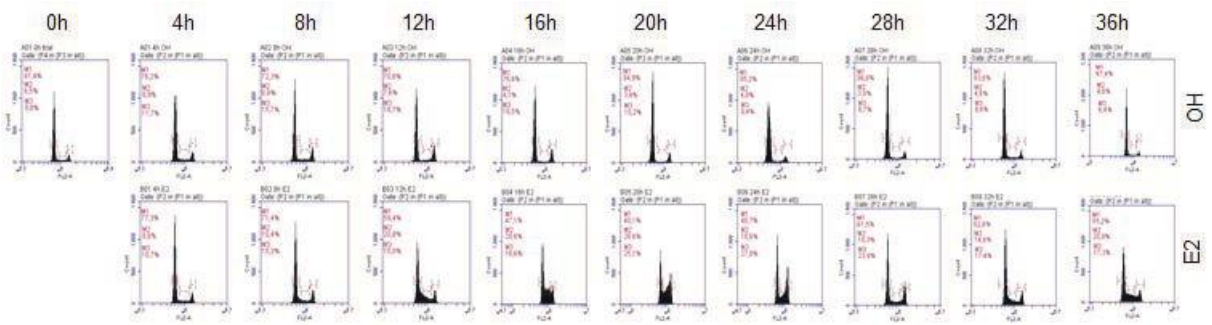
Project Team Member: Öykü Deniz Demiralay and Elif Yapıcı

Research Advisor: Prof. Dr. Mesut Muyan

Abstract:

Levels and compositions of proteins are important in regulating cellular growth. Actively dividing cells pass through phases known as the cell cycle. Cellular transcriptional and epigenetic mechanisms govern cell cycle progression: proteins are involved in regulating the cycle and each has a role in specific phases. Therefore the levels of these proteins change during the cycle critical for the progression to the next phase. Estrogens are steroid hormones playing critical roles in regulating cellular proliferation and differentiation. Our previous studies showed that CXXC5 protein is an estrogen responsive gene product, an epigenetic factor and involved in gene expression resulting in proliferation. Since epigenetic regulation is critical for cell phase transitions, we predicted that CXXC5 synthesis is cell cycle-dependent. To test our hypothesis, we took cellular extracts of synchronized cells, performed western blots to monitor the CXXC5 protein levels and found out that CXXC5 is indeed a cell cycle-dependent gene product.





Monitoring the Cell Cycle Dependent CXXC5 Synthesis

Name of the Project: New Generation Wind Turbine

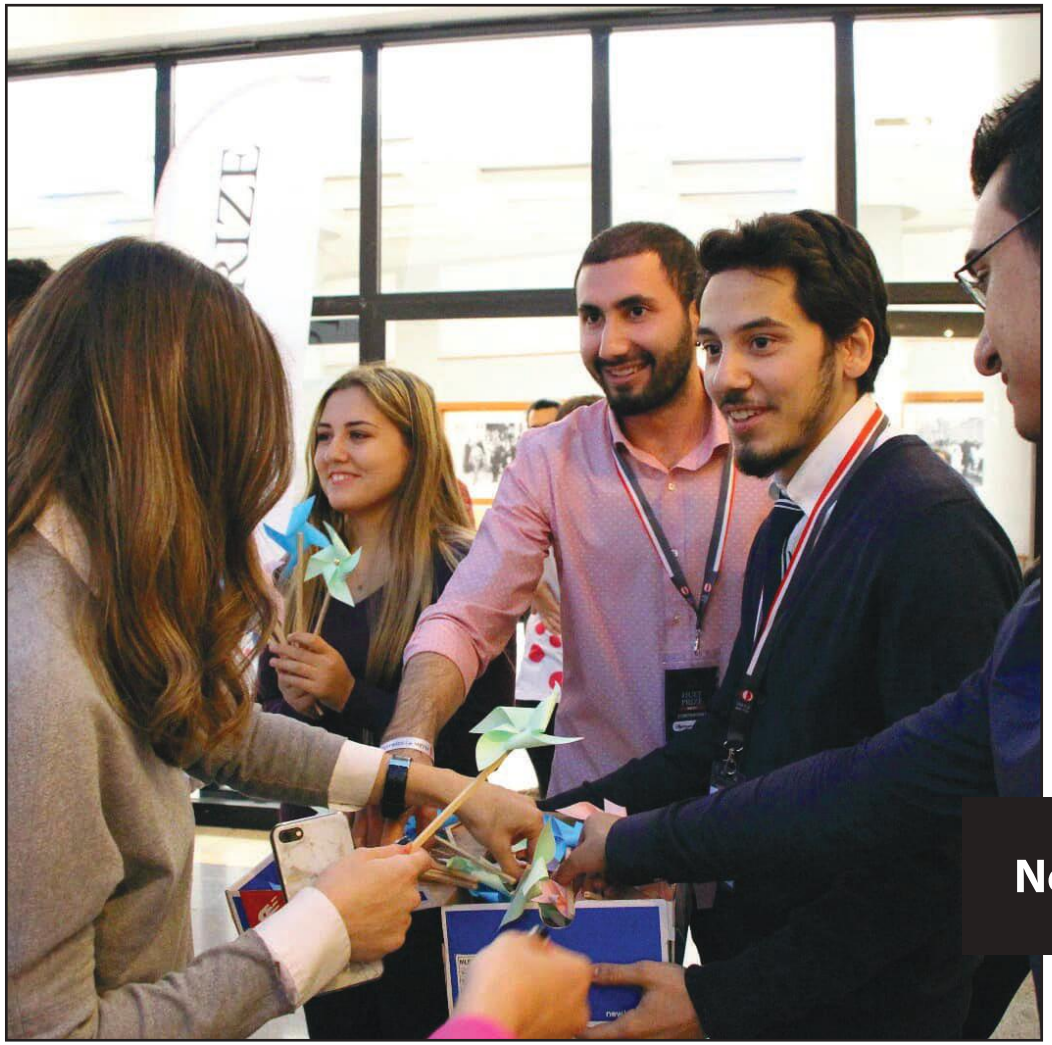
Field of Research: Renewable Energy

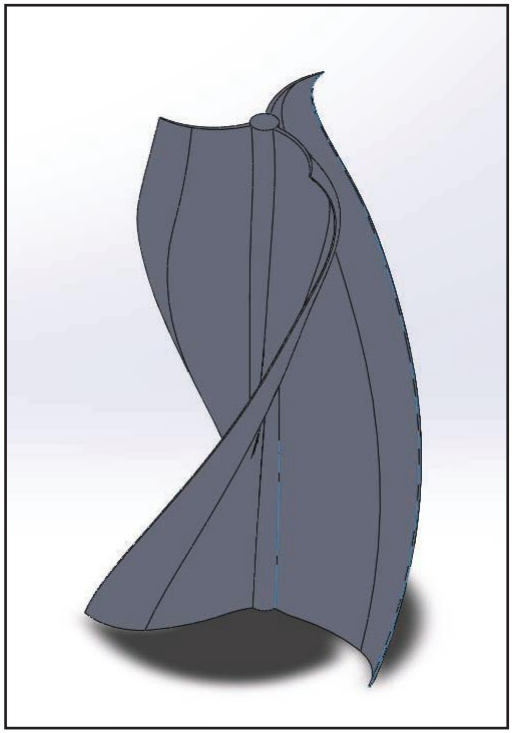
Project Team Members: Anıl Güneş, Uğurcan Kartal, Serhat Boztoğan, Enes Canbo, Enes Güneş, Emre Aydın and Nisansu Balcı

Project Supervisor: Prof. Dr. İsmail Aydın and Asst. Prof. Dr. Elif Oğuz

Abstract:

In our project, we came up with some facts: in order not to damage the ecosystem a renewable energy source should be used, this source should be scalable and sustainable, the source should provide brand new opportunities for the world. At this point we have focused on developing vertical axis wind turbine instead of traditional turbine types. Their advantages are easy adaption to different areas such as inside of the cities, top of the buildings and wind farms. In addition, differently from traditional turbines, our design is cheaper and easy to install. In the engineering part, we made various analyses to understand behavior of the system against flow and measured strength of structure. According to them, the shape of turbine was changed several times to obtain more efficient design.





New Generation Wind Turbine

Name of the Project: ORDOT II

Field of Research: Aerospace and Rocketry

Project Team Members: Alpcan Tunç, Murat Özüm Duru, Çağatay Yıldırım, Ozan Tamer Yiğit, Aysima Beril Baydar and Muhammet Tekin

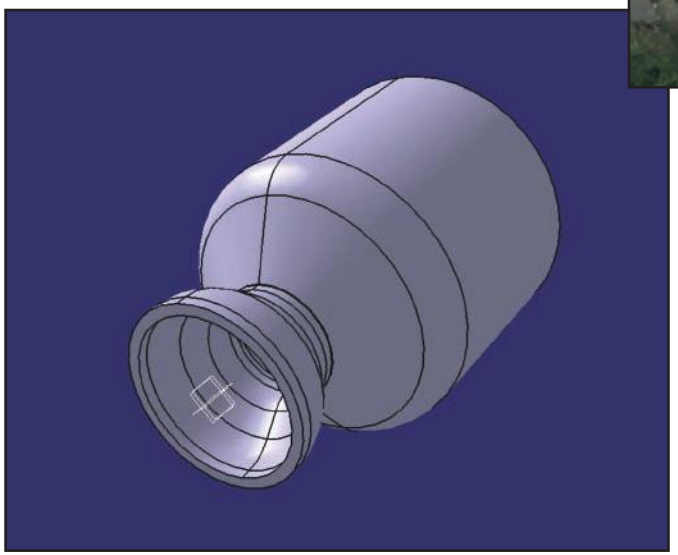
Project Supervisor: Prof. Dr. Ahmet Oral

Abstract:

Exploring the space is an interdisciplinary field that cannot be held by huge companies, even the universities should have their own space programs. The purpose of this project is to design and construct a reusable, liquid rocket with using the local and university resources and leaving a legacy about rocketry to this university. In order to be able to construct the rocket, connections are made with departments, companies and individuals. 1-D flow analysis through the nozzle is integrated with the performance and design. Simulations are performed and engine is designed after iterations. A ground test platform is designed and constructed using local resources. Three different engines are designed in case of the different conditions (from 8 to 15 bars and 30 to 60 kgs). Ignition system is being made by the team's future members. Gaseous fuel and oxidizers are selected to lower the budget significantly. A lot of steps are taken in order to create a consistent, rigid and permanent environment for rocket enthusiasts and solid moves are made to prove ourselves.


SCIENTIA DUX VITAE CERTISSIMUS
MMXVI
METU
ROCKET SOCIETY


ORTA DOĞU TEKNİK ÜNİVE
MIDDLE EAST TECHNICAL



ORDOT II

Name of the Project: PestTest

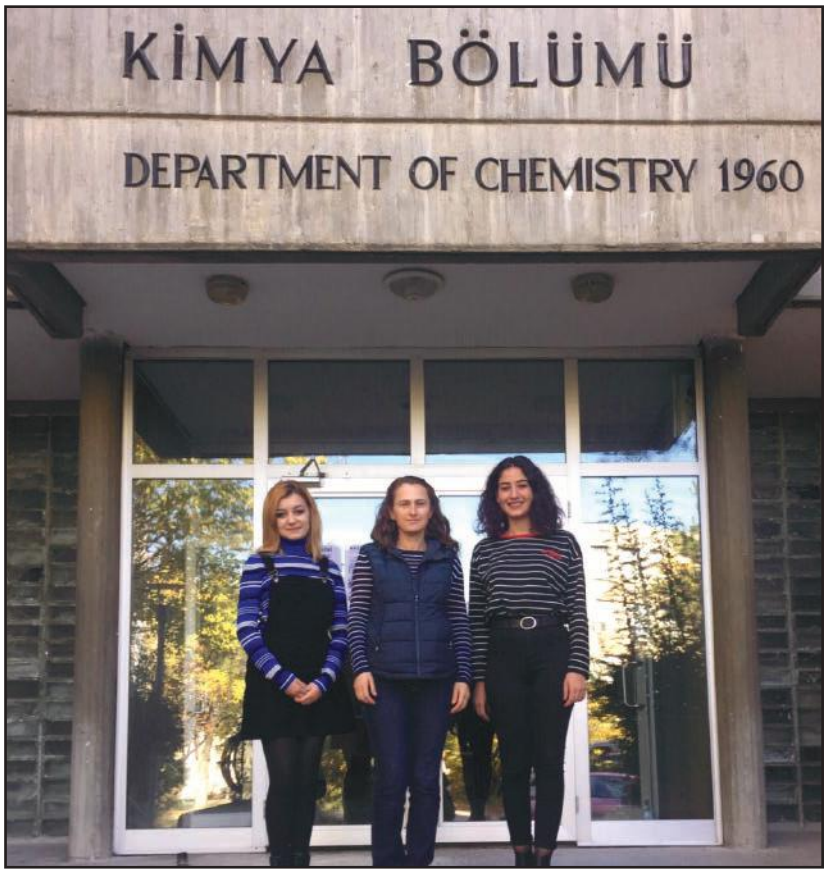
Field of Research: Analytical Chemistry, Toxicology

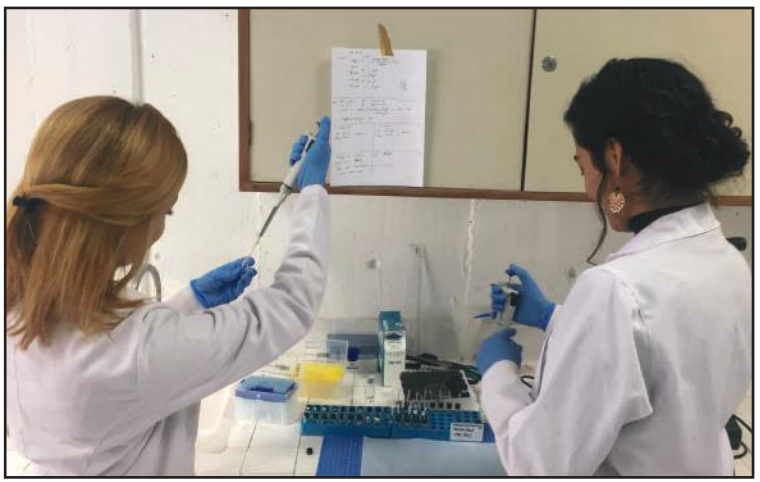
Project Team Members: Kübra Kahremanoğlu and Ezgi Rana Temel

Project Supervisor: Assoc. Prof. Dr. Ezel Boyacı

Abstract:

Pesticides are poisons and unfortunately they can harm more than just the "pest" which are targeted. They are toxic and exposure to pesticides is linked to a range of serious diseases in human. The usage of pesticides in agriculture in Turkey shows an increase by 45% from 1979 to 2002. By this project it is targeted to find traces of pesticides or their associated metabolites in human urine by developing a new method that is based on Solid Phase Microextraction (SPME). SPME device is a micro-sized probe coated with an extractive phase showing affinity towards various compounds and can be used for multi-residue analysis. To able to show the residues, urinary excretion of the pesticides or their metabolites which are originated from metabolism of them in human body is focused. This project has an importance because at the end of it, it will be shown that whether people are exposed to pesticides by air/vegetables/water or any external factor or NOT.





PestTest

Name of the Project: Production of Mitotically Inactivated Mouse Embryonic Fibroblast Cells to be used in Pluripotent Stem Cell Studies

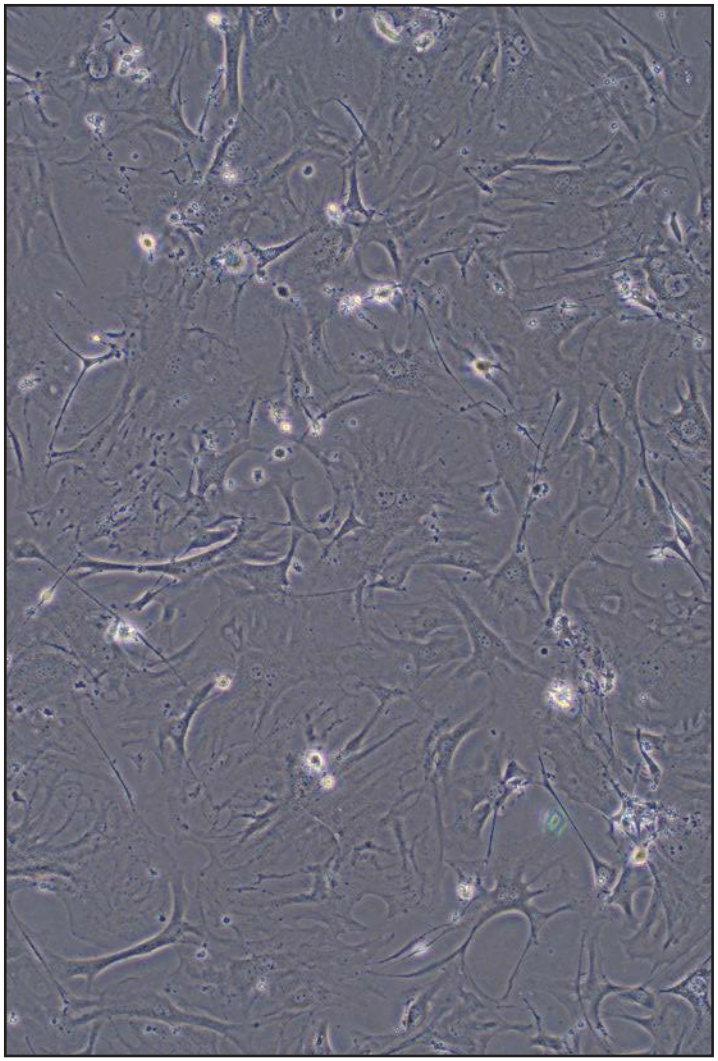
Field of Research: Neurobiology

Project Team Members: Dilara Koç, Sena Ezgin, Gizem Altun, Edanur Şen and Onur Can Begentaş

Project Supervisor: Assist. Prof. Dr. Erkan Kiriş

Abstract:

Physiologically relevant cellular models are crucial for molecular studies to understand mechanisms underlying neurodegenerative diseases. Neurons differentiated from pluripotent stem cells can provide such systems, allowing large scale studies. To do so, stem cells have to be cultured at ideal conditions so they do not lose their differentiation capacities. Towards this goal, mouse embryonic fibroblast (MEF) cells are used as feeder cells in stem cell culture as they secrete factors crucial for the maintenance of pluripotency. MEFs are mitotically-inactivated to inhibit their over-growth to utilize in stem cell culture. Although mitotically-inactivated MEFs are commercially available from foreign companies, they are highly costly considering large amounts of MEFs needed in stem cell culture. Within this project, we generated our own mitotically-inactivated MEF cell stocks, which both saves money for our research program, and also help to decrease our dependency on foreign companies for this research tool.



Production of Mitotically Inactivated Mouse Embryonic Fibroblast Cells to be used in Pluripotent Stem Cell Studies

Name of the Project: Selenium Coated Antibacterial Sutures

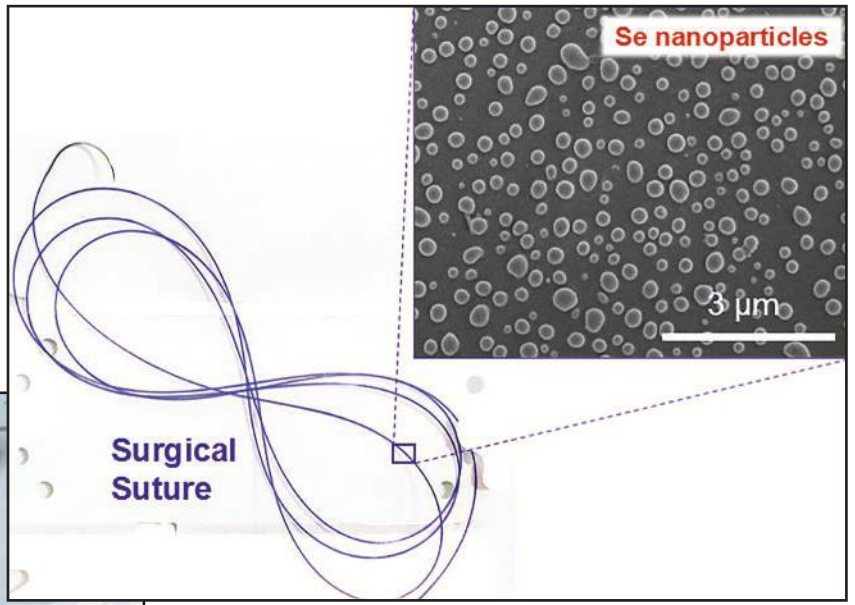
Field of Research: Biomaterials

Project Team Members: Zeynep Cemre Örsel

Project Supervisor: Assist. Prof. Dr. Batur Ercan

Abstract:

The use of traditional antibiotics shows a decreased efficacy for the treatments of surgical site infections caused by antibiotic resistant bacteria found in healthcare settings. Antibacterial coatings of surgical sutures with elemental selenium could be a potential remedy to prevent surgical site infections. Selenium is a trace element found in human body with proven antibacterial properties. It exhibits very low cytotoxicity and hemolytic effects at concentrations sufficient to inhibit bacteria proliferation and infection development. In this study, conventionally used surgical sutures were coated with selenium nanoparticles via a quick precipitation method. Size and coverage of selenium nanoparticles on suture surfaces were adjusted through optimization of reaction parameters such as duration of reaction and concentrations of selenium precursor and reducing agent. Further studies will include the assessment of antibacterial properties of coated sutures with both gram negative and gram positive bacteria and provide insight on their potential use for prevention of surgical site infections.



Selenium Coated Antibacterial Sutures

Name of the Project: Superhydrophobic Metallic Surfaces

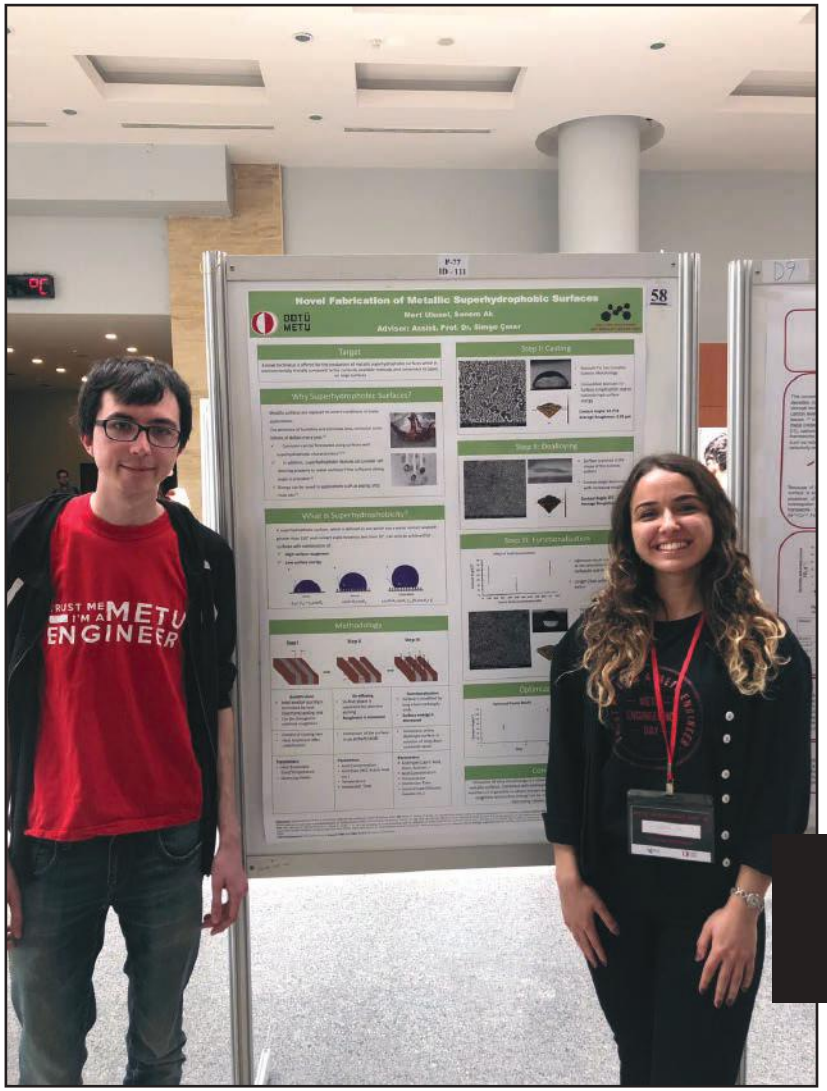
Field of Research: Materials Engineering

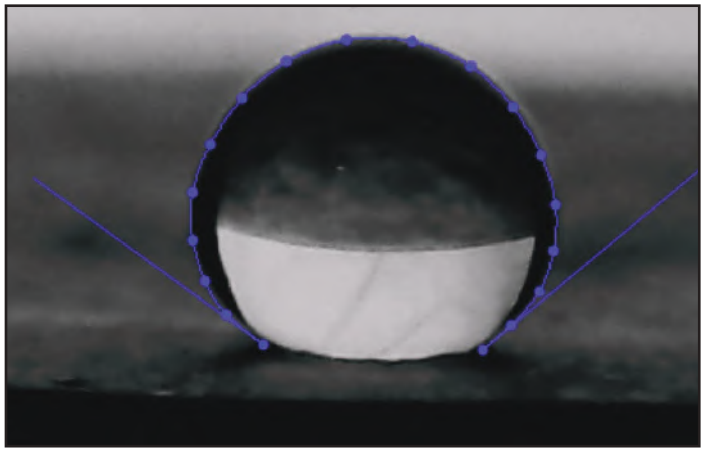
Project Team Members: Mert Ulusel and Senem Ak

Project Supervisor: Assist. Prof. Dr. Simge Çınar

Abstract:

In this project, the production of a superhydrophobic surface is targeted by forming hierarchical roughness on a metallic surface and lowering the surface energy. In order to get hierarchical surface roughness, a material with eutectic composition is chosen for this experiment to utilize its lamellar structure. This material is decided as the eutectic Bi-Sn alloy due to its low melting point. To get the surface roughness and low surface energy, etching and modification with carboxylic acids processes are applied. Several reaction parameters of the process steps are studied, such as acid concentrations and reaction times, and the specimens are characterized.





Superhydrophobic Metallic Surfaces

Name of the Project: Synthesis, Characterization and Drug Delivery Applications of Mesoporous Silica Coated, Luminescent and Magnetic Gd1-Xfexbo3:Ce,Tb@Sio2 Core Shell Nanoparticles

Field of Research: Inorganic Chemistry

Project Team Members: Ecem Çelik and Pelin Akman

Project Supervisor: Prof. Dr. Ayşen Yılmaz

Abstract:

In this project, the aim was to synthesize a multifunctional core/shell type nanoparticle to be used as a drug carrier and bioimaging agent in the future. A poorly soluble non-steroidal anti-inflammatory drug Celecoxib was chosen as the model drug. Luminescent and magnetic Fe doped GdBO3 core particles were synthesized by sol-gel method, Ce and Tb were also doped in different concentrations to this material to obtain high luminescence intensity. The core was coated with mesoporous silica to enhance drug loading/release properties and improve bioavailability of the drug. Characterization was done with different techniques which are X-Ray Diffractometry (XRD), Fourier-Transform Infra-red spectroscopy (FTIR), Photoluminescence spectrometry (PL), High performance liquid chromatography (HPLC), Ultraviolet-Visible Spectrometry (UV-VIS).

Synthesis, Characterization and Drug Delivery Applications of Mesoporous Silica Coated, Luminescent and Magnetic Gd1-Xfexbo3:Ce,Tb@Sio2 Core Shell Nanoparticles

Name of the Project: The Effects of Mutually Opposing Forces on Propulsion of Underwater Vehicles

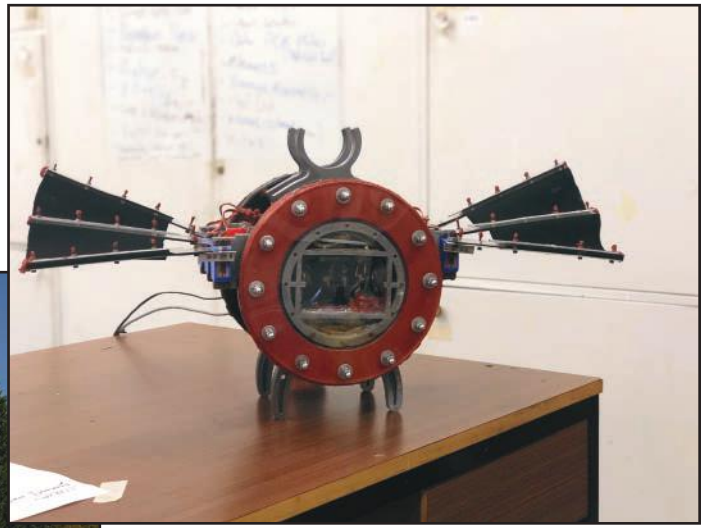
Field of Research: Bioinspired Robotics

Project Team Members: Atakan Durmaz, Furkan Kazanç, Firdevs Su Aydın, Mustafa Akbaba

Project Supervisor: Assist. Prof. Dr. Mustafa Mert Ankaralı

Abstract:

In this project, it is aimed to examine the effect of mutually opposing forces on propulsion of underwater vehicles. Moreover, a robot, which can perform simple but time-consuming tasks hard to performed by divers, will set an example for academic resources in our country. This robot will also be a security system for solo divers, which will protect the distance with the diver and give alarm to surface in an emergency case. Nautilius, whose mechanical structure is found out, is expected to become more autonomous with mapping and object avoidance techniques soon.



The Effects of Mutually Opposing Forces on Propulsion of Underwater Vehicles

Name of the Project: The Relaxing Effect of the Maternal Heartbeat on Anxiety of Their Adult Children

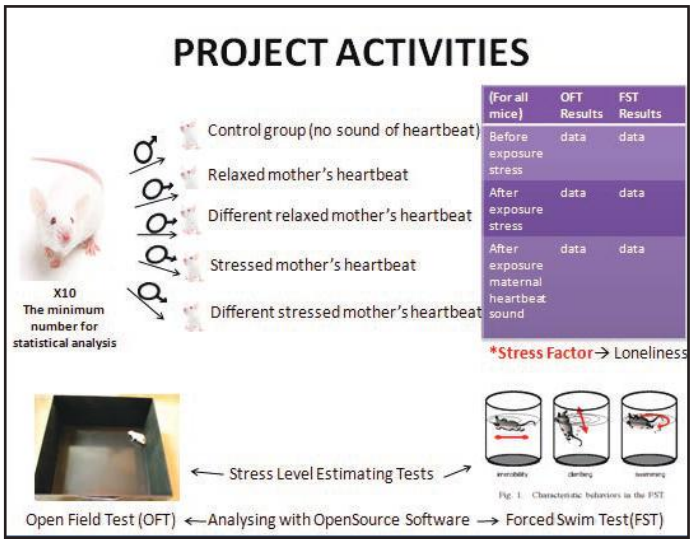
Field of Research: Biopsychology

Project Team Members: Yankı Tandırcıoğlu and Utkucan Genç

Project Supervisor: Prof. Dr. Mesut Muyan and Prof. Dr. Mustafa Yılmaz

Abstract:

The absolute objective of this project is to treat the psychological problems related to anxiety of the adults by using their own maternal heartbeat sound during the period of their mother' s pregnancy. This project is based on two different researches: heartbeats' uniqueness at each person like fingerprints' uniqueness, and the observed relaxing effects of any maternal heartbeat on infants. It is planned to use mice as subjects of this experiment. In order to measure of the level of anxiety of each male adult mice, it is planned to perform Open Field and Force Swim Tests onto the mice. If it is taken significant results on the decreasement of anxiety, it is aimed to decrease psychological drug usage for further stages.



The Relaxing Effect of the Maternal Heartbeat on Anxiety of Their Adult Children

Name of the Project: Zero Waste for METU Campus

Field of Research: Sustainability

Project Team Members: Selin Gökçe and Ceyda Kalıpçıoğlu

Project Supervisor: Assist. Prof. Dr. Zöhre Kurt

Abstract:

There are lots of people spending most of their time in middle east technical university, so the generation of solid waste is the inevitable consequence. Due to not being conscious about waste produced, people does not take on adequate significance in metu campus. “Zero Waste for METU Campus Project” focuses on encouragement to create eco-friendly and sustainable campus. The main purpose is to raise awareness about the generated waste and zero waste concept. Social media campaigns have been carried out, and informative social media posts are announced in accordance with zero waste concept. Online surveys are carried out to collect data about the knowledge of the followers. To promote people to join surveys, some followers are awarded with zero waste products, cloth bag and sustainable water bottle. Observations are made to analyse behavioral change of people on related issue. We can change the world by creating more sustainable campus.

Zero Waste for METU Campus

We would like to express out deep gratitude for all METU alumni and friends for their valuable support.

https://adimodtu.org.tr/projeler

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MIDDLE EAST TECHNICAL UNIVERSITY