

Prof. Ali AKPEK

Personal Information

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International Researcher IDs

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Biography

Prof. Dr. Akpek was born in Karsiyaka, İzmir, Turkey. He received his B.Eng degree from department of biomedical engineering of Baskent University as one of the first biomedical engineers of the country. During his education, he mainly focused on biomedical electronics. After graduation he expanded his research interest to biotechnology and obtained a Master of Science degree in Biotechnology from Ege University. He mainly focused on microbiology and nanoionics during his master training. In 2010, he is awarded with Monbukagakusho scholarship from Japan and worked as a research scientist in Bionanotechnology Laboratory at Department of Bioengineering of University of Tokyo. His main research theme was "Nanochannel Fabrication Methodologies for Cell Fusion". He started his Dr. Eng training in Tokyo Institute of Technology in 2011. His main doctoral researches were "Non-Uniform Temperature Field in Viscosity Measurement" and "Adapting a Magnetic Levitating Artificial Blood Pump as a Vibrational Viscometer". This research is supervised by Prof. Toshiharu Kagawa. During his doctoral training, he is mainly focused on Fluid Engineering and Heat & Mass Transfer phenomena.

After completing doctoral studies, he served as a visiting assistant professor at Harvard University and the Massachusetts Institute of Technology (Harvard University-Massachusetts Institute of Technology Division of Health Science and Technology, Harvard Medical School, Brigham and Women's Hospital), fully funded once again. During this time, he conducted research on tissue engineering, microfluidic devices, and the development of innovative biomaterials.

Following his role as an Assistant Professor Doctor in the Biomedical Engineering Department at Istanbul Yeni Yüzyıl University in Turkey, he transitioned to the Bioengineering Department at Gebze Technical University. After working there as an Associate Professor for about 4 years, he moved to Yıldız Technical University's Biomedical Engineering Department, where he continues to work. Additionally, between 2018 to 2021 he served as a part-time researcher at Sabancı University Nanotechnology Application and Research Center.

He completed the Executive MBA (Business Administration for Executives) program at Istanbul Technical University between 2022 and 2023.

He has authored over 50 academic publications, and as of December 2023, these publications have received over 1500 citations. His current (as of December 2023) h-index is 14, and i-10 index is 21 (Google Scholar ID Pm9pObEAAAAJ). For research laboratory and detailed information check www.alialab.com

Since 2015, he has been involved in research and development as well as commercialization stages of medical devices and products under the name Alia Venture Engineering and Consulting. The company has worked on numerous projects and is currently aiming to transform into a private equity fund operating in the field of biotechnology. For detailed information check www.alia.com.tr

Throughout his career, he has successfully taken 10+ high-tech classified and biotechnology products from THS-0 level to THS-9 level in Turkey, products that were either never produced before or were very limited. These products have been successfully introduced to the market, sold, and contributed to import substitution.

He has native-level proficiency in English and high proficiency (speaking and listening) in Japanese.

He is married and a father of a daughter.

Education Information

Postgraduate, Istanbul Technical University, Lisansüstü Eğitim Enstitüsü, Executive MBA, Turkey 2022 - 2023

Post Doctorate, Harvard University, Tıp Fakültesi, Tıp Fakültesi, United States Of America 2015 - 2016

Post Doctorate, Massachusetts Institute of Technology, Division of Health Science and Technology, Division of Health Science and Technology, United States Of America 2015 - 2016

Doctorate, Tokyo Institute of Technology, Graduate School of Science and Engineering, Mechano-Micro Engineering, Japan 2011 - 2014

Postgraduate, Ege University, Fen Bilimleri Enstitüsü, Biyoteknoloji, Turkey 2008 - 2009

Undergraduate, Baskent University, Faculty Of Engineering, Department Of Biomedical Engineering, Turkey 2001 - 2006

Foreign Languages

English, C2 Mastery

Japanese, B2 Upper Intermediate

Dissertations

Doctorate, KOYUN KALP KAPAKÇIĞININ HÜCRE SİZLEŞTİRİLMESİYLE REJENERATİF İNSAN KALP KAPAKÇIĞININ GELİŞTİRİLMESİ VE ETKİNLİĞİNİN DEĞERLENDİRİLMESİ, Bilecik Seyh Edebali University, Fen Bilimleri Enstitüsü, Moleküler Biyoloji ve Genetik, 2023

Postgraduate, Design and development of a personalized medicine oriented microfluidic organ on a chip platform, Gebze Technical University, Institute Of Biotechnology, Department Of Biotechnology (Interdisciplinary), 2020

Postgraduate, Elektrikli lineer eyleyiciyle oluşturulan mekanik sistem ile TPR 20/10 doz ölçümü ve standart değerler ile karşılaştırılması , Istanbul Yeni Yuzyil University, Institute Of Science, Biyomedikal Mühendisliği Bölümü, 2018

Research Areas

Biomedical Engineering, Engineering and Technology

Academic Titles / Tasks

Professor, Yildiz Technical University, Faculty Of Electrical & Electronics, Biomedical Engineering, 2024 - Continues
Associate Professor, Yildiz Technical University, Faculty Of Electrical & Electronics, Biomedical Engineering, 2021 - 2024
Associate Professor, Gebze Technical University, Faculty Of Engineering, Department Of Bioengineering, 2018 - 2021
Assistant Professor, Gebze Technical University, Faculty Of Engineering, Department Of Bioengineering, 2017 - 2018
Assistant Professor, Istanbul Yeni Yuzyil University, Faculty Of Engineering-Architecture, Department Of Biomedical Engineering, 2014 - 2017
Assistant Professor, Harvard University, 2015 - 2016
Assistant Professor, Massachusetts Institute of Technology, 2015 - 2016
Research Assistant, Tokyo Institute of Technology, Graduate School of Science and Engineering, Mechano-Micro Engineering, 2011 - 2014
Researcher, Tokyo University, Bioengineering, Bionanotechnology, 2010 - 2011

Courses

Undergraduate

Biomechanics II, Undergraduate, 2021 - 2022
Therapeutic and Prosthetic Devices, Undergraduate, 2021 - 2022
Fluid Mechanics, Undergraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019
Biomechanics I, Undergraduate, 2021 - 2022
Introduction to Bioengineering, Undergraduate, 2020 - 2021, 2019 - 2020, 2018 - 2019

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Advances in xenogeneic donor decellularized organs: A review on studies with sheep and porcine-derived heart valves**
Inal M. S., AVCI H., Hassan S., DARCAN C., Shin S. R., AKPEK A.
Bioengineering and Translational Medicine, vol.9, no.6, 2024 (SCI-Expanded)
- II. **Molecular Separation by Using Active and Passive Microfluidic chip Designs: A Comprehensive Review**
Ebrahimi A., İÇÖZ K., Didarian R., Shih C., Tarim E. A., Nasseri B., AKPEK A., Cecen B., Bal-Ozturk A., Güleç K., et al.
Advanced Materials Interfaces, vol.11, no.2, 2024 (SCI-Expanded)
- III. **In vitro recellularization and characterization of sheep pulmonary valves after decellularization for preclinical studies** *Koyun pulmoner kalp kapakçıklarının hüresizleştirilmesi sonrası preklinik çalışmalar için in vitro olarak yeniden hürelendirilmesi ve karakterizasyonu*
İnal M. S., DARCAN C., AKPEK A.
Journal of the Faculty of Engineering and Architecture of Gazi University, vol.40, no.1, pp.515-527, 2024 (SCI-Expanded)
- IV. **Detailed Analysis of the Effects of Viscosity Measurement Errors Caused by Heat Transfer during Continuous Viscosity Measurements under Various Temperature Changes and the Proposed Solution of a Non-Dimensional Parameter Called the Akpek Number**
AKPEK A.
Applied Sciences (Switzerland), vol.13, no.19, 2023 (SCI-Expanded)
- V. **Eggshell integrated GelMA/CSMA/HyMA hybrid hydrogels for cell therapy/tissue engineering**
Yüce-Erarslan E., İzbudak B., Kızılkurtlu A. A., Topal M., AKPEK A., Bal-Öztürk A.
Journal of Applied Polymer Science, vol.140, no.34, 2023 (SCI-Expanded)
- VI. **Characterization of a Decellularized Sheep Pulmonary Heart Valves and Analysis of Their Capability as a Xenograft Initial Matrix Material in Heart Valve Tissue Engineering**

İnal M. S., DARCAN C., AKPEK A.

Bioengineering, vol.10, no.8, 2023 (SCI-Expanded)

VII. **Current Strategies for the Regeneration of Skeletal Muscle Tissue**

ALARÇIN E., Bal-ozturk A., AVCI H., GHORBANPOOR H., DOĞAN GÜZEL F., AKPEK A., Yesiltas G., Canak-Ipek T., Avci-Adali M.

INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, vol.22, no.11, 2021 (SCI-Expanded)

VIII. **Tissue adhesives: From research to clinical translation**

Bal-Ozturk A., Cecen B., Avci-Adali M., Topkaya S. N., ALARÇIN E., YAŞAYAN G., Li Y. E., Bulkurcuoglu B., AKPEK A., Avci H., et al.

NANO TODAY, vol.36, 2021 (SCI-Expanded)

IX. **Analysis of Surface Properties of Ag and Ti Ion-Treated Medical Textiles by Metal Vapor Vacuum Arc Ion Implantation**

AKPEK A.

COATINGS, vol.11, no.1, 2021 (SCI-Expanded)

X. **3D Bioprinting: from Benches to Translational Applications**

Heinrich M. A., Liu W., Jimenez A., Yang J., Akpek A., Liu X., Pi Q., Mu X., Hu N., Schiffelers R. M., et al.

SMALL, vol.15, no.23, 2019 (SCI-Expanded)

XI. **Development of a heart assist device as a vibrational viscometer that estimates blood viscosity**

Akpek A.

JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.34, no.1, pp.235-246, 2019 (SCI-Expanded)

XII. **A novel design of an electromagnetically levitated vibrational viscometer for biomedical and clinical applications**

Akpek A.

TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, vol.27, no.2, pp.819-831, 2019 (SCI-Expanded)

XIII. **Recent advances in organ-on-a-chip technologies and future challenges: a review**

AVCI H., DOĞAN GÜZEL F., EROL S., Akpek A.

TURKISH JOURNAL OF CHEMISTRY, vol.42, no.3, pp.587-610, 2018 (SCI-Expanded)

XIV. **Lung on a Chip for Drug Screening and Design**

Kizilkurtlu A. A., Polat T., Aydin G. B., Akpek A.

CURRENT PHARMACEUTICAL DESIGN, vol.24, no.45, pp.5386-5396, 2018 (SCI-Expanded)

XV. **Analysis of biocompatibility characteristics of stereolithography applied three dimensional (3D) bioprinted artificial heart valves**

Akpek A.

JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.33, no.3, pp.929-938, 2018 (SCI-Expanded)

XVI. **3D Printed Anchoring Sutures for Permanent Shaping of Tissues**

Wei W., Li Y., Yang H., Nassab R., Shahriyari F., Akpek A., Guan X., Liu Y., Taranejoo S., Tamayol A., et al.

MACROMOLECULAR BIOSCIENCE, vol.17, no.12, 2017 (SCI-Expanded)

XVII. **Extrusion Bioprinting of Shear-Thinning Gelatin Methacryloyl Bioinks**

Liu W., Heinrich M. A., Zhou Y., Akpek A., Hu N., Liu X., Guan X., Zhong Z., Jin X., Khademhosseini A., et al.

ADVANCED HEALTHCARE MATERIALS, vol.6, no.12, 2017 (SCI-Expanded)

XVIII. **4D bioprinting: the next-generation technology for biofabrication enabled by stimuli-responsive materials**

Li Y., Zhang Y. S., Akpek A., Shin S. R., Khademhosseini A.

BIOFABRICATION, vol.9, no.1, 2017 (SCI-Expanded)

XIX. **Effect of non-uniform temperature field in viscosity measurement**

Akpek A.

JOURNAL OF VISUALIZATION, vol.19, no.2, pp.291-299, 2016 (SCI-Expanded)

XX. **Modification of anti-bacterial surface properties of textile polymers by vacuum arc ion source**

implantation

Nikolaev A. G., Yushkov G. Y., Oks E. M., Oztarhan A., Akpek A., Hames-Kocabas E., Urkac E. S., Brown I. G.
APPLIED SURFACE SCIENCE, vol.310, pp.51-55, 2014 (SCI-Expanded)

Books

- I. **KİŞİSELLEŞTİRİLMİŞ TIP TEKNOLOJİSİ VE UYGULAMALARI**
Akpek A.
in: SAĞLIKTA SON TRENDLER, Can ÖZLÜ, Editor, Akademi Kitabevi Yayınları, İstanbul, pp.663-680, 2021
- II. **Polimerlerin Medikal Amaçlı Kullanımları**
Akpek A.
in: Polimerler: Özellikleri ve Uygulamaları, Hüseyin AVCI, Editor, ESOĞÜ Basımevi, Eskişehir, pp.205-224, 2021
- III. **Yapay Organlar**
Akpek A.
in: Biyomedikal Mühendisliği ve Uygulamaları, Onur Koçak; Osman Eroğlu, Editor, Elektrik Mühendisleri Odası Yayınevi, Ankara, pp.525-542, 2019

Papers Published in Refereed Scientific Meetings

- I. **Three Dimensional (3D) Fabrication of Multilayered Heart Valve Tissues by Stereolithography technique**
Akpek A.
21st National Biomedical Engineering Meeting (BIYOMUT), İstanbul, Turkey, 24 November - 26 December 2017
- II. **Three Dimensional Bioprinting of Tissue Engineered Artificial Heart Valves by Stereolithography**
Akpek A.
21st National Biomedical Engineering Meeting (BIYOMUT), İstanbul, Turkey, 24 November - 26 December 2017
- III. **Design of a System That Measures the Effect of Environmental Temperature on Ultrasonic Nebulizers**
Sari S., Akpek A.
National Conference on Electrical, Electronics and Biomedical Engineering (ELECO), Bursa, Turkey, 1 - 03 December 2016, pp.491-495
- IV. **A Medical Waste Management Model for Public Private Partnership Hospitals**
Kocak O., Kurtuldu H., Akpek A., Kocoglu A., Eroglu O.
Medical Technologies National Conference (TIPTEKNO), Antalya, Turkey, 27 - 29 October 2016
- V. **New Concept Design of an Insulin Pen for Visually Impaired or Blind Diabetus Mellitus Patients**
Ucar T., Kocak O., Akpek A.
Medical Technologies National Conference (TIPTEKNO), Antalya, Turkey, 27 - 29 October 2016
- VI. **A New Algorithm for Segmentation and Fracture Detection in X-Ray Images**
Bulut S., Ozcinar A., Ciftcioglu C., Akpek A.
Medical Technologies National Conference (TIPTEKNO), Bodrum, Turkey, 15 - 18 October 2015
- VII. **Remote Control of Centrifuge and Injection Systems via MATLAB and ARDUINO**
Ciftcioglu C., Kocak O., Akpek A.
Medical Technologies National Conference (TIPTEKNO), Bodrum, Turkey, 15 - 18 October 2015
- VIII. **Electronic Pillbox Design for Demantia Patients.**
Cebeci S. A., Ciftcioglu C., Kocak O., Akpek A.
Medical Technologies National Conference (TIPTEKNO), Bodrum, Turkey, 15 - 18 October 2015
- IX. **Design and Analysis of an Autoclave Simulation Using MATLAB/Simulink**
Altinsu B., Kocak O., Akpek A.
Medical Technologies National Conference (TIPTEKNO), Antalya, Turkey, 27 - 29 October 2016

X. Temperature Measurement Control Problem of Vibrational Viscometers Considering Heat Generation and Heat Transfer Effect of Oscillators

Akpek A., Youn C., Kagawa T.

9th Asian Control Conference (ASCC), İstanbul, Turkey, 23 - 26 June 2013

Supported Projects

- AKPEK A., SEZGİN E., Project Supported by Higher Education Institutions, DERİN YANIK DOKULARI İÇİN IN SITU 3B ELEKTROEĞİRME YÖNTEMİ İLE TASARLANMIŞ BİR FANTOM DOKU MODELİ ÜZERİNDE ÇOK KATMANLI DERİ DOKUSU BİYOFABRİKASYONU, 2024 - 2024
- AKPEK A., GÜREL PEKÖZER G., TRABZON L., Project Supported by Higher Education Institutions, Mikroakışkan bir Çip üstü Miyokard Enfarktüs Platformu Tasarımlanması ve Kalp Krizlerinin In Vitro Olarak Modellenmesi, 2022 - 2024
- Akpek A., TUBITAK Project, Tümlşik bir Çip üstü Kardiyovasküler Sistem Platformunun Tasarımlanması ve Geliştirilmesi, 2021 - 2024
- Akpek A., TUBITAK Project, KOZMETİK VE İLAÇ GELİŞTİRME ÇALIŞMALARI İÇİN ÇİP ÜSTÜ DERİ SİSTEMİ TASARLANMASI VE GELİŞTİRİLMESİ, 2022 - 2023
- Akpek A., Bozkurt E., TUBITAK Project, Mikroekstrüzyon biyoyazıcı aracılığı ile in situ kemik doku biyofabrikasyonu, 2022 - 2023
- Akpek A., Kaya Ş., TUBITAK Project, Mısır nişastası ve kolajen bazlı viskoelastik özellikleri ayarlanabilir, düşük maliyetli, enkejte edilebilir doku yapıştırıcısı geliştirilmesi, 2022 - 2023
- AKPEK A., ÖNDER S., DARCAN C., İNAL M. S., GÜREL PEKÖZER G., ÖZTÜRK A. B., KIZILKURLU A. A., Project Supported by Higher Education Institutions, Kardiyovasküler Cerrahide Kullanılmak Üzere Ksenogreft Kalp Kapakçığının Deselülerizasyon Ertesi Altın Nanoparçacıkları ile İmplantasyonu ve Riboflavin/Heparin Kaplanması Sonrasında İnsan Hücreleri ile Reselülerizasyonu, 2021 - 2023
- Akpek A., TUBITAK Project, AĞIR YANIK, AĞIR YARALANMA YA DA DERİ HASTALIKLARI TEDAVİSİ İÇİN KULLANILACAK DERİ EŞDEĞERİ BİYOFABRİKASYONU, 2021 - 2023
- Akpek A., Tiryaki A., TUBITAK Project, Yapay kemik uygulamaları için yeni nesil biyomalzeme geliştirilmesi, 2021 - 2022
- Akpek A., Özçelik A., TUBITAK Project, In situ biyobaskı yöntemi ile 3B yara örtüsü biyofabrikasyonu, 2021 - 2022
- Akpek A., Yüncü N. Ş., TUBITAK Project, Yapay deri uygulamaları için yeni nesil biyomalzeme geliştirilmesi, 2020 - 2021
- Akpek A., Öztürk A. B., TUBITAK Project, Kıkırdak ve Kemik Rejenerasyonu İçin 3-Boyutlu Biyoyazıcı Teknolojisi ile Biyomimetik Nanohibrit Doku İskelelerinin Geliştirilmesi ve in vivo Osteokondral Hasar Modelinde Değerlendirilmesi, 2018 - 2021
- Akpek A., Alarçin E., TUBITAK Project, Kemik Hasarlarının Tedavisi İçin Üç Boyutlu Baskılama Yöntemi İle İlaç Taşıyıcı Doku İskelelerinin Hazırlanması, In Vitro Karakterizasyonu Ve In Vivo Kalvaryal Kemik Hasarı Modelinde Değerlendirilmesi, 2018 - 2021
- Akpek A., Akharman E., TUBITAK Project, Kalp dokusu için yeni nesil biyomalzeme geliştirilmesi, 2019 - 2020
- Akpek A., -, TUBITAK Project, Masaüstü Delta Tipi Süratli Multimateryal 3B Biyoyazıcının Geliştirilmesi, 2018 - 2019
- Akpek A., Project Supported by Higher Education Institutions, 3B Biyonik kol ünitesine deri dokusu üretimi gerçekleştirilmesi, 2018 - 2019
- Akpek A., TUBITAK Project, Çok Katmanlı Deri Dokularının 3b Biyoyazıcılar Aracılığı İle Üretilmesi, Mikroakışkan Biyoreaktörler İle Geliştirilmesi, Çip Üzerine Deri Uygulamaları İçin Değerlendirilmesi Ve Biyonik Kol Uygulamaları İçin Olası Kullanımlarının Araştırılması, 2018 - 2019
- Akpek A., Universities of Other Countries Supported Project, Stereolitografi aracılığı ile 3B kalp kapakçıkları tasarımı ve geliştirilmesi, 2015 - 2016
- Akpek A., Project Supported by Other Official Institutions, Medikal Alanlar için Hava Sterilizasyon Ünitesi Tasarımı, 2015 - 2016

Metrics

