

# AYŞE AY

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## EDUCATION

### One League | Global

Stanford Online Certificate of Achievement in Innovation & Entrepreneurship, 2023 – 2024

*Modules: Essentials of Entrepreneurship, Negotiation, Cultivating the Entrepreneurial Mindset, Empathize & Prototype, Finance, Building Business Models*

### Sabancı University | Istanbul, Türkiye

Doctor of Philosophy in Materials Science and Nanoengineering, 2020 – 2024

**Research interests:** Polymers, colloidal science, additive manufacturing, ceramics

### Passed qualifying exams:

Synthesis and processing, mechanical properties and deformation, characterization and modelling of materials, structure and properties of condensed matter

**Courses assisted:** Polymer Engineering: Processing and Applications (1x), Polymer Chemistry and Physics (1x), Polymer Synthesis (1x), Organic Chemistry (1x), Materials Selection for Product Design (1x)

### Imperial College London | London, United Kingdom

Master of Science in Materials Science and Engineering, 2017 – 2018

*Dissertation: CuO nanostructures for non-enzymatic glucose sensing*

### Boğaziçi University | Istanbul, Türkiye

Bachelor of Science in Chemistry with Double Major in Chemical Engineering, 2011 – 2017

*Thesis: Design of microchips for tissue engineering and fabrication of microbioreactors*

*Graduation seminar: Is it possible to repair cartilage defects by using HA-TG gels and young chondrocytes?*

## SUMMARY

PhD candidate in Materials Science and Nanoengineering skilled in polymer synthesis and ceramics processing. Experienced in inhaler formulation and process development, with expertise in materials characterization using SEM/EDX, XPS, XRD, FT-IR, TG-DTA, DSC, AFM, and DLS. Recognized as a Leader of Tomorrow in Biotechnology in 2022.

## WORK EXPERIENCE

### Neutec | Istanbul, Türkiye

Formulation Development Assistant Specialist | Jun 2019 – Jul 2020

- Supervised pilot manufacturing, technology transfer, and process validation of dry powder and metered dose inhalers
- Designed patient simulation of inhalers
- Collaborated with cross-functional teams to ensure timely development and commercialization of inhalation drug products, applied for FDA approval

### GSK | Istanbul, Türkiye

R&D Medical Affairs Intern | Jun 2016 – Jul 2017

- Facilitated launch of meningitis vaccine by preparing training materials for field force, accelerated globally conducted antibiotics awareness project and re-launch of Augmentin (SOAR) by proof-reading medical articles
- Simplified global vaccines presentations to be used in Türkiye
- Conducted medical affairs documentations by preparing donations and scientific engagement contracts
- Prepared exam questions for field force and medical department

### bp | Bursa, Türkiye

Quality Control Intern | Aug 2014 – Sept 2014

- Assisted quality control of lubricants by performing daily TBN, viscosity and density tests
- Project: Research of ISO17025 Laboratory Accreditation

### ExxonMobil | Istanbul, Türkiye

Quality Assurance Intern | Sept 2014 – Oct 2014

- Performed quality control of lubricants by performing daily density, demulsibility characteristics, colour, ICP-AES, pour point, viscosity, foaming tendency and flash point tests

### AkzoNobel Powder Coatings | Izmir, Türkiye

Production Intern | Jun 2014 – Jul 2014

- Assisted quality control department for a week by performing colour and colour difference, film thickness, particle size, gloss tests and application of electrostatic paint

## RESEARCH EXPERIENCE

### Aerial Robotics Lab, Imperial College London | London, United Kingdom

Visiting PhD Student | Nov 2022

Worked at ARL to test flying modes of bio-inspired gliders for aerial deployment of fertilizers

### Akbulut Lab, Sabancı University | Istanbul, Türkiye

Research Assistant | Sep 2020 – Present

Worked with Dr. Ozge Akbulut to prototype i) controlled-release systems for agricultural application, ii) bio-inspired gliders, iii) magnetic fiber robots via 3D printing, iv) advanced ceramics to adapt Industry 4.0

### Cartilage Engineering and Regeneration Lab, ETH Zürich | Zurich, Switzerland

Amgen Scholars Programme Research Intern | Aug 2014 – Sept 2014

## HONORS & AWARDS

2023 Presidential Scholarship Award, One League, California, USA

2022 Leaders of Tomorrow in Biotech, GapSummit, Cambridge, UK

2015 Amgen Foundation Research Scholarship, Zurich, Switzerland

2010 The Duke of Edinburgh's Award Bronze Medal

## SKILLS

### CHARACTERISATION & TECHNICAL SKILLS

- X-ray diffraction
- X-ray photoelectron spectroscopy
- Fourier-transform infrared spectroscopy
- Atomic force microscopy
- Thermogravimetry differential thermal analysis
- Dynamic light scattering
- Scanning electron microscopy
- Rheometer
- Fluorescence, confocal microscopy
- Computer numerical control (CNC) machining
- Universal testing machine

### SOFT SKILLS

- SOLIDWORKS
- ChemCAD
- MATLAB
- Origin
- JMP-SAS
- Autodesk Fusion 360
- COMSOL (Microfluidics module)
- SimaPro
- OpenLCA

## LEADERSHIP & COMMUNITY

- Volunteer Science Teacher at Okul Destek Derneği (a nonprofit organization that promotes equal opportunities in Turkish education)
- Member of Sabanci University Sailing Club (2020 – Present)
- Turkish Sailing Federation Certified Sailor (2015 – 2016)
- Member of Boğaziçi University Sailing Club (2013 – 2015)
- Executive Board Member of BU Science Club (2014 – 2015)

## PERSONAL

- Fluent in English
- B1 in German (02/2016)
- Enjoys sailing, sewing, and crafting

Worked with Prof. Marcy Zenobi-Wong to regenerate cartilage: conducted the process of cell culturing from the first stage until its implantation. Staining, MTS, live-dead assay, cryo-sectioning were done.

## Akin Laser and Spectroscopy Laboratory, Boğaziçi University | Istanbul, Türkiye

Undergraduate Research Student | Feb 2014 – Aug 2014

Worked with Dr. Ahi Akin to calculate the energy of molecules by using Gaussian, Marvin and ChemCraft programmes

## Nugay Polymer Laboratory, Boğaziçi University | Istanbul, Türkiye

Undergraduate Research Student | Feb 2013 – May 2013

Worked with Prof. Nihan Nugay in Bio-Artificial Pancreas Project: Swelling tests of the synthesized polymer were done.

## PEER-REVIEWED JOURNAL ARTICLES

[1] Ay et al. Self-standing doughs of alumina enable CNC Machining. ACS Applied Materials & Interfaces. 2023 (submitted)

[2] Ay et al. Zero waste, room temperature encapsulation of a fertilizer through core-shell 3D printing for controlled release. Applied Materials Today. 2023 (submitted)

[3] Arel et al. Encapsulation of carbon dots in a core-shell mesh through coaxial direct ink writing for improved crop growth. ACS Sustainable Chemistry & Engineering. 2023

[4] Liu et al. Oxidation of copper electrodes on flexible polyimide substrates for Non-enzymatic glucose sensing. Materials Research Express. 2022

## CONFERENCES

[1] Ozhan et al. No material leak, large-scale (even roll-to-roll), and mold-free near net-shaping of advanced ceramics is possible, 18<sup>th</sup> Congress of the European Ceramic Society, July 2023, Lyon, France

[2] Ay et al. Prototyping of degradable meshes through direct ink writing for fertilizer release, 38th International Conference of the Polymer Processing Society, May 2023, St. Gallen, Switzerland

[3] Arel et al. Encapsulation of carbon dots in a core-shell mesh through coaxial direct ink writing for improved crop growth, 38th International Conference of the Polymer Processing Society, May 2023, St. Gallen, Switzerland

[4] Wang et al. Fluorescent carbon dots for bio-imaging and enhanced light harvesting, European Materials Research Society 2022 Spring Meeting, June 2022, Online

[5] Ay et al. Harnessing the width of mechanical properties of waterborne polyurethane (WBPU) for biomedical applications, International Biotechnology Congress, 2021, Istanbul, Türkiye

## REFERENCES

Available upon request.