DOCTORAL CANDIDATE POSITION

DC[8] – Moisture-Insensitive Aerogel Packaging for Mechanical Shock Protection

Position	DC8 - Moisture-Insensitive Aerogel Packaging for Mechanical Shock Protection
Project	FAroGels – Food-Grade Aerogels for Sustainable Food Systems
Funding programme	Horizon Europe – Marie Skłodowska-Curie Actions Doctoral Networks (HORIZON-MSCA-2025-DN-01-01)
Grant Agreement number	101312450
Recruiting/Host organisation	Middle East Technical University (METU), Food Engineering Department, Ankara, Türkiye
PhD awarding institution	Middle East Technical University (METU), Ankara, Türkiye – Food Engineering, Biotechnology or Biochemistry graduate programme
Type of contract	Fixed-term employment contract, 36 months
Job status	Full-time (100%)
Application deadline	09 December 2026, 23:59 (CET)
Expected start date	March 2027 (earliest)

About FAroGels

FAroGels – Food-Grade Aerogels for Sustainable Food Systems is a Marie Skłodowska-Curie Actions Doctoral Network funded by the European Union under Horizon Europe. The network brings together academic and non-academic partners with complementary expertise in food science and technology, materials science, biopolymer science, biotechnology, process engineering, analytical characterization, packaging and sustainable innovation. **FAroGels** aims to develop, characterize and validate food-grade, bio-based and biodegradable aerogels for sustainable food systems. The network will investigate how these highly porous materials can support more efficient food processing, improved food quality and safety, nutritional and sensory functionality, protection and delivery of bioactive compounds, and sustainable packaging solutions.

Position Description

This position forms part of the **FAroGels** research program on food-grade, bio-based, and biodegradable aerogels and their application in sustainable food systems. The selected candidate will be employed by METU and will be required to enroll as a PhD student at METU, in accordance with the relevant admission and enrolment requirements.

- Food transport still relies heavily on petroleum-based cushioning foams. Bio-based aerogels offer excellent shock absorption at very low density, but their sensitivity to moisture limits their use under real logistics conditions. DC8 will develop moisture-insensitive, food-contact-safe aerogel packaging materials that can replace these foams. Aerogels will be produced from cellulose, alginate and chitosan with tailored pore structures and surface chemistries, using controlled supercritical CO_2 drying for consistent structural integrity. Food-approved hydrophobisation strategies, such as mild salinisation and thin wax-based coatings, will be applied so that biodegradability and regulatory compliance are preserved. Each material will be evaluated for moisture uptake, mechanical compression and recovery, dynamic shock absorption and microstructure, guiding iterative optimisation and prototype development. The expected outcomes are moisture-tolerant aerogels with stable mechanical behaviour under variable humidity, datasets linking structure and surface modification to cushioning performance, validated packaging prototypes tested under simulated logistics conditions, and benchmark comparisons with biodegradable and petrochemical foams. DC8 anchors the packaging stream of FAroGels: it builds on the upstream materials developed in the network, uses shared characterisation workflows so that results remain comparable across projects, and feeds

prototypes and datasets into the FAroGels packaging design guidelines, in close connection with DC9 on thermal insulation and DC12 on active and safe packaging.
- The position will involve laboratory-based research, data analysis, scientific communication and close collaboration with other FAroGels Doctoral Candidates, supervisors and partner organizations.

Supervisory Team

The Doctoral Candidate will be supervised by a team combining academic and non-academic expertise:

Role	Name	Organisation	Country
Main supervisor	Mecit Halil Öztop	Middle East Technical University (METU)	Türkiye
Academic co-supervisor	Dr. Lara Manzocco	Università degli Studi di Udine (UNIUD)	Italy
Industry supervisor	Dr. Vincenzo De Tata	Barilla G. e R. Fratelli S.p.A. (BRL)	Italy

Planned Secondments

As part of the training programme, the Doctoral Candidate will complete planned secondments at FAroGels partner organisations:

Host organisation	Sector	Country	Duration
University of Santiago de Compostela (USC)	Academic	Spain	1 month
AGH University of Krakow (AGH)	Academic	Poland	2 months
MyBiotech GmbH (MyB)	Non-academic	Germany	2 months
Barilla G. e R. Fratelli S.p.A. (BRL)	Non-academic	Italy	2 months

Main Responsibilities

The Doctoral Candidate will be expected to:
- Conduct research on the development and characterisation of moisture-insensitive, food-contact-safe aerogel packaging materials for mechanical shock protection in food transport.
- Plan, perform, document and analyse experimental work using relevant laboratory, analytical, processing and/or modelling methods.
- Collaborate with academic and non-academic partners across the FAroGels network, including during the planned secondments.
- Participate actively in FAroGels network meetings, training schools, workshops and transferable-skills activities.
- Prepare scientific reports, contributions to project deliverables, presentations and publications, and contribute to dissemination and communication activities.

Requirements

- Master's degree (or equivalent) in food engineering, food science and technology, chemistry, chemical engineering, biotechnology, materials science or a related field.
- Strong laboratory and analytical skills, in particular in biopolymer and hydrogel processing, mechanical testing (e.g. compression, resilience and shock absorption), moisture sorption and humidity studies, and physicochemical characterisation (e.g. BET, SEM, FTIR, rheology); experience with supercritical CO_2 drying, surface modification or packaging testing is an asset.
- Fluency in written and spoken English.
- Strong motivation to pursue doctoral research in an international and interdisciplinary environment.
- Ability to work independently while contributing effectively to collaborative research activities.
- Good organization, communication and problem-solving skills.
- Willingness to travel for planned secondments, network meetings and training activities.
- Prepare scientific reports, project deliverables, presentations, publications and, where relevant, other dissemination or exploitation-related outputs.

MSCA Doctoral Network Eligibility Criteria

Applicants of any nationality are welcome to apply. At the date of recruitment, applicants must meet the following MSCA Doctoral Network requirements:
- **Doctoral candidate status:** Applicants must not already hold a doctoral degree. Applicants who have successfully defended their doctoral thesis but have not yet been formally awarded the doctoral degree are not eligible.
- **Mobility rule:** Applicants must not have resided or carried out their main activity (work, studies, etc.) in Türkiye for more than 12 months in the 36 months immediately before the recruitment date. Compulsory national service, short

stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention or EU temporary protection are not taken into account. **Compliance is verified before the start of employment, on the basis of the candidate's passport and, where necessary, other documents.**

- **PhD enrolment:** Doctoral Candidates must be enrolled in a doctoral programme leading to the award of a doctoral degree in at least one EU Member State or Horizon Europe Associated Country. For this position, this is the doctoral programme at METU; applicants must therefore meet its admission requirements.
- **Institution-specific requirements:** For enrolment at METU (in the Food Engineering, Biotechnology or Biochemistry PhD programme): English proficiency of at least METU EPE 65, or TOEFL iBT 79 or PTE Academic 70 (IELTS is not accepted; native speakers graduating from an English-medium university are exempt), an ALES (quantitative) score or an equivalent GRE Quantitative score – ALES 70 / GRE Q 153 for Food Engineering and Biotechnology, ALES 65 / GRE Q 152 for Biochemistry – and the minimum grade point average of the chosen programme (Food Engineering: BSc CGPA 2.75/4.00 or MSc CGPA 3.50/4.00; Biotechnology and Biochemistry: BSc CGPA 2.50/4.00 and MSc CGPA 3.00/4.00). Full details are given in the table below.
  The doctoral school at METU takes 4 years, which requires continuation as PhD student for 1 year after finishing the employment contract.

→ **Visa and residence permit:** a visa or residence/work permit is not required at the application stage and is not a selection criterion. Where needed, it will be arranged after selection and before the start of employment, with the support of the recruiting organisation. Candidates from non-EU countries are equally welcome to apply.

What FAroGels Offers

- A full-time doctoral position funded through the FAroGels MSCA Doctoral Network.
- A fixed-term employment contract for 36 months at METU.
- A competitive salary and employment conditions in accordance with the MSCA Doctoral Networks funding provisions, applicable national legislation and the policies of the Recruiting / Host Institution.
- Social-security coverage and other employment-related benefits in accordance with the applicable national and institutional framework.
- A Personal Career Development Plan (PCDP), prepared with the supervisory team and reviewed and updated during the project.
- Access to research facilities, infrastructure, training and support services at METU and within the FAroGels network.
- Participation in a structured doctoral training programme including scientific and technical training, transferable skills, career development and innovation-oriented activities.
- Planned secondments at FAroGels partner organizations, offering complementary scientific, technical and cross-sectoral experience.
- An international research environment and opportunities to build a professional network across academia and non-academic organizations.

Salary and Financial Package

This position is funded by the FAroGels MSCA Doctoral Network (HORIZON-MSCA-2025-DN-01-01, Grant Agreement No. 101312450). The salary is based on the following monthly MSCA allowances:

- **Living allowance:** EUR 4,010, adjusted **by the country correction coefficient** of the country of the recruiting organisation to ensure equal treatment and comparable purchasing power for all researchers.
- **Mobility allowance:** EUR 710, contributing to mobility-related costs such as relocation and travel.
- **Family allowance (if applicable):** EUR 660, paid for the months in which the Doctoral Candidate has a family during the project, including where family obligations arise after recruitment. 'Family' means persons linked to the researcher by marriage (or a relationship with equivalent status recognised by the legislation of the country where it was formalised) or dependent children actually being maintained by the researcher. The allowance is paid in accordance with the rules of the recruiting organisation, and supporting documents may be requested.

Monthly MSCA allowances for this position

Component	Calculation (per month)
Living allowance	EUR 4,010 × [country correction coefficient = 64.5%] (see guidance below)
Mobility allowance	Fixed amount = EUR 710.00
Total without family allowance	Living + mobility allowance
Total with family allowance	Living + mobility + EUR 660

Please note: *the amounts above represent the total employment cost, from which the employer's and the employee's compulsory social-security contributions and taxes are deducted in accordance with national law. Unless the recruiting organisation provides additional funding, the gross salary paid to the Doctoral Candidate is therefore lower than these amounts, and the net salary depends on personal circumstances.*

Country correction coefficients of the FAroGels beneficiaries

Country	CCC	Living allowance	+ mobility (EUR 710)	+ family (EUR 660)
Türkiye	64.5%	2,586.45	3,296.45	3,956.45
Poland	74.1%	2,971.41	3,681.41	4,341.41
Italy	95.3%	3,821.53	4,531.53	5,191.53
Spain	95.6%	3,833.56	4,543.56	5,203.56
Germany	101.2%	4,058.12	4,768.12	5,428.12
Finland	118.0%	4,731.80	5,441.80	6,101.80
United Kingdom	141.7%	5,682.17	6,392.17	7,052.17

Employment conditions: the Doctoral Candidate will be hired full-time (100%) by the recruiting organisation on a 36-month employment contract, with social-security coverage under national law that continues during secondments.

Funding Duration and PhD Completion

- This Doctoral Candidate position is funded by the FAroGels MSCA Doctoral Network for a maximum period of 36 months.
- The overall period required to complete a PhD degree may, depending on the regulations of the PhD awarding institution and applicable national requirements, extend beyond the 36-month FAroGels funding period.

Please note: *any employment, scholarship or other financial support beyond the 36-month FAroGels funding period is not covered or guaranteed by FAroGels. Any potential continuation of employment or funding would need to be considered separately between the relevant institution and the Doctoral Candidate, subject to institutional regulations and the availability of funds.*

About the Host and PhD Awarding Institution(s)/Organizations

Middle East Technical University (METU) is one of Türkiye's leading public research universities and the coordinator of the FAroGels Doctoral Network. English is the language of instruction in all its programmes, and its community brings together students and researchers from Türkiye and around a hundred other countries. Its main campus in Ankara is among the largest in Europe: a green, self-contained setting of some 4,500 hectares, with a planted forest, Lake Eymir and extensive sports, cultural and social facilities alongside the research buildings.

The Department of Food Engineering carries out research across food engineering and processing, food safety, food biotechnology, food microbiology and food chemistry, with dedicated laboratories for food processing, food imaging, rheology and texture analysis, and non-thermal processing. For FAroGels, the department provides extensive food engineering, materials science and biotechnology facilities, including advanced analytical platforms (texture analysis, HPLC, LC-MS/MS, TD-NMR, microscopy, rheology) and well-established food-structure laboratories. The Doctoral Candidate will join an international, industry-connected research group and work at the interface of food engineering and advanced materials.

The successful candidate must fulfil the admission and enrolment requirements of METU.

Item	Information
Doctoral programme / doctoral school	PhD programmes in Food Engineering, Biotechnology or Biochemistry, METU Graduate School of Natural and Applied Sciences
Relevant faculty / department	Department of Food Engineering (Faculty of Engineering); Biotechnology and Biochemistry graduate programmes, METU Graduate School of Natural and Applied Sciences

Item	Information
PhD admission and enrolment requirements	**For the PhD programme:** - an MSc degree (or awaiting graduation). English proficiency (same for all three programmes): a METU English Proficiency Examination (EPE) score of at least 65, or an equivalent score from one of the exams on METU's official equivalence list, i.e. TOEFL iBT at least 79 or PTE Academic at least 70. IELTS is not on this list. The score must be valid (2 years) at the time of application. Applicants whose mother language or official language is English and who graduated from a university where the language of instruction is English may instead declare native-speaker status in the online application form. Official equivalence table: https://oidb.metu.edu.tr/en/equivalence-table-english-language-exams-recognized-metu-undergraduate-and-graduate-students); - a graduate entrance exam score: applicants submit either an ALES score (score type: quantitative/"sayısal") or, as is usual for international applicants, an equivalent GRE Quantitative score; both are valid for 5 years. The minimum differs per programme: Food Engineering and Biotechnology require ALES 70, which corresponds to GRE Quantitative 153; Biochemistry requires ALES 65, which corresponds to GRE Quantitative 152 (conversion table: https://fbe.metu.edu.tr/en/ales-gre-equivalence-table; exam rules: https://fbe.metu.edu.tr/en/graduate-exams) (The GRE exam can be taken or provided later on a conditional basis); - the minimum grade point average of the chosen programme: Food Engineering – a BSc CGPA of at least 2.75/4.00 or an MSc CGPA of at least 3.50/4.00 (https://fde.metu.edu.tr/en/admission-requirements); Biotechnology – a BSc CGPA of at least 2.50/4.00 and an MSc CGPA of at least 3.00/4.00 (https://fbe.metu.edu.tr/en/biotechnology); Biochemistry – a BSc CGPA of at least 2.50/4.00 and an MSc CGPA of at least 3.00/4.00 (https://fbe.metu.edu.tr/en/biochemistry); - a letter of intention (part of the online application form); - two reference letters (It is preferred that one of the references be from the MSc thesis advisor.) - both undergraduate and graduate transcripts must be submitted.
Separate PhD application or enrolment procedure	- Yes. In addition to the FAroGels application, the selected candidate must apply separately to the METU Graduate School of Natural and Applied Sciences through the online system at https://application.metu.edu.tr/ during an official application period announced in the METU academic calendar (https://oidb.metu.edu.tr/en/academic-calendar). - All documents are uploaded online; no hard copies are submitted. An application fee is paid by credit card for each programme (https://oidb.metu.edu.tr/en/fees).
Recognition of foreign qualifications	- Food Engineering: https://fbe.metu.edu.tr/en/food-engineering - Biotechnology: https://fbe.metu.edu.tr/en/biotechnology - Biochemistry: https://fbe.metu.edu.tr/en/biochemistry
Additional requirements	English proficiency: the equivalence table recognised by METU lists the METU EPE, TOEFL iBT and PTE Academic only – IELTS is not included. Applicants whose mother language or official language is English and who graduated from a university where the language of instruction is English may instead declare native-speaker status in the online form. After arrival, international students obtain a foreign identity number and a residence permit with the support of the METU International Students Office (https://iso.metu.edu.tr/en). Enrolment fees to the PhD Programme at METU may apply (https://iso.metu.edu.tr/en/system/files/2026-2027_tuition_fees_14092026.pdf).

Application Documents

Applicants are strongly advised to read the position description and the eligibility criteria carefully before applying. Each application must include:

- A detailed curriculum vitae (education, research experience, technical skills and relevant achievements), including the dates and countries of residence, studies and employment for the last 36 months.
- A motivation letter explaining your interest in this position and your suitability for the project.
- Copies of Bachelor's and Master's diplomas and academic transcripts, or evidence that the Master's degree will be completed before the recruitment date.
- Contact details of two referees and reference letters (It is preferred that one of the references be from the MSc thesis advisor).
- Proof of English-language proficiency, if required by the PhD awarding institution.
- Incomplete applications may not be considered.

How to Apply

Application route: FAroGels online application form: please complete the application form at https://farogels.eu/apply/.

Indicative timeline

- **Application deadline:** 09 December 2026, 23:59 (CET)
- **Interviews:** January 2027
- **Evaluation:** February 2027
- **Selection outcome:** February 2027
- **Expected start of employment:** March 2027 (earliest)

Please note: *Applicants should ensure that all required documents are submitted before the stated deadline. Please note that a separate PhD admission and/or enrolment procedure may apply at METU.*

Selection Process

FAroGels follows an open, transparent and merit-based recruitment process in line with the European Charter for Researchers:

- **Eligibility check** by the FAroGels Project Manager.
- **Evaluation** of the eligible applications by an Interview Committee (primary supervisor, co-supervisor(s) and a representative of a non-academic partner) with a standardised scoring matrix; the three to five best-ranked candidates are shortlisted.
- **Online interview** with the shortlisted candidates.
- **Approval** of the selection by the FAroGels Supervisory Board, after which an offer is made.

All applicants are informed of the outcome and receive feedback on request.

Equal Opportunities and Data Protection

FAroGels and METU are committed to equal opportunities, diversity and inclusion. Applications from all qualified candidates are welcome, irrespective of gender, gender identity or expression, sexual orientation, ethnic or social origin, nationality, disability, age, religion or belief.

Personal data submitted with applications will be processed by METU exclusively for recruitment purposes and in accordance with the applicable data-protection legislation and institutional privacy policies.

Contact Information

- **Scientific, application process, PhD admission questions about the related DC project:**

Prof. Dr. Mecit Halil Öztop

Department of Food Engineering, METU

e-mail address: mecit@metu.edu.tr

- **General questions about FAroGels and the recruitment process:** FAroGels Project Management Team, Middle East Technical University (METU), Ankara, Türkiye – farogels@metu.edu.tr
- **General information on FAroGels:** https://farogels.eu/



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