PARTNER SEARCH INFORMATION NOTE

Eureka Network Projects Biotech Call / Sustainable and green biomanufacturing

Yıldız Technical University – Prof. Dr. Cem Bülent Üstündağ

Announcement Seeking a Project Partner / Collaborating Organisation for Work Packages WP4–WP7

Yıldız Technical University (YTU), founded in 1911, is one of Türkiye's leading and well-established technical universities, with a strong tradition of education, research, and innovation. The University comprises 10 faculties, 3 graduate schools, and numerous research and application centers, bringing together a large and diverse academic community. YTU conducts research across a broad range of disciplines, ranging from engineering to education sciences, administrative sciences, and other fields. With its strong research infrastructure, qualified academic staff, extensive international collaborations, and experience in national and international R&D projects, YTU actively contributes to the development of innovative and sustainable solutions to global challenges.

1. Purpose and Scope of the Project

The project is an end-to-end value chain project that begins with the use of agricultural by-products containing phenolic compounds and essential oils as raw materials, and covers the extraction of phenolic compounds and essential oils, the conversion of the remaining biomass into activated carbon, and ultimately the use of these components in cosmetic formulations (antioxidant, antimicrobial, skin-compatible products). The project is planned to be carried out over a 24-month timeline.

The project's WP2 and WP3 work packages (raw material characterisation and green extraction) are currently underway; project partner(s) are sought to provide technical/scientific contribution in work packages WP4, WP5, WP6 and WP7. This information note contains the partnership call for the aforementioned work packages.

2. Project Work Packages (Overview)

WP No	Work Package	Lead	Months	Main Output
WP1	Project Management and Consortium Coordination	Dermo Grup	1–24	Management plan, interim/final reports, consortium agreement
WP2	Raw Material Supply, Characterisation and Pre-processing (biomass collection, drying, milling, standard sample bank)	—	1–6	Characterised raw material batches, SOPs
WP3	Green Extraction of Phenolic Compounds and Essential Oils (subcritical water / ultrasound-assisted / supercritical CO_2) and purification	—	4–14	Optimised extraction protocol, standardised phenolic extract and essential oil fraction
WP4	Conversion of the Remaining Biomass into Activated Carbon (pyrolysis/carbonisation and activation optimisation)	Partner sought	6–16	Cosmetic-compatible activated carbon powder, porosity/adsorption data
WP5	Cosmetic Formulation Development and Safety/Efficacy Testing (antioxidant, antimicrobial, skin compatibility)	Partner sought	12–20	Prototype formulations (serum, mask, cleanser), in-vitro test reports
WP6	Scale-up, Cost Analysis and Commercialisation Plan	All Partners	18–24	Pilot-scale production data, business plan, commercialisation roadmap, IP strategy

WP No	Work Package	Lead	Months	Main Output
WP7	Dissemination, Standardisation and IP Management	All Partners	1–24	Patent application (if any), publications, fair/event participation

Note: The rows highlighted in yellow (WP4–WP7) are the work packages on which the partner search is focused.

3. Details of the Work Packages Seeking Partners (WP4–WP7)

WP4 — Conversion of the Remaining Biomass into Activated Carbon (Months 6–16)

- Optimisation of pyrolysis/carbonisation and activation process parameters
- Development of activated carbon powder targeting porosity, surface area and adsorption capacity suitable for cosmetic applications
- Expected output: cosmetic-compatible activated carbon powder and characterisation (porosity/adsorption) data

WP5 — Cosmetic Formulation Development and Safety/Efficacy Testing (Months 12–20)

- Development of prototype formulations (serum, mask, cleanser) containing phenolic extract, essential oil and activated carbon components
- In-vitro testing and safety assessments for antioxidant, antimicrobial efficacy and skin compatibility
- Expected output: prototype formulations and in-vitro test reports

WP6 — Scale-up, Cost Analysis and Commercialisation Plan (Months 18–24)

- Generation of pilot-scale production data and scaling up of the processes
- Cost/feasibility analyses via techno-economic assessment (TEA) and preparation of a business plan and commercialisation roadmap
- Expected output: pilot-scale production data, business plan, commercialisation roadmap and IP strategy

WP7 — Dissemination, Standardisation and IP Management (Months 1–24)

- Standardisation of project outputs, potential patent applications and management of the intellectual property strategy
- Dissemination activities through scientific publications, fairs and event participation
- Expected output: patent application (if any), publications, fair/event participation

4. Cross-Cutting Areas of Expertise Particularly Sought

In addition to the work packages above, partner(s) to contribute across the project in the following methodological/analytical areas are particularly sought:

a) Life Cycle Analysis (LCA)

- Environmental impact assessment of the process from raw material to final product (energy, carbon footprint, input-output analysis)
- Definition of sustainability indicators and their integration into WP6/WP7 outputs

b) Techno-Economic Assessment (TEA)

- Technical-economic feasibility modelling of scale-up scenarios within WP6
- Investment/operating cost analyses and financial projections for the commercialisation strategy

c) Design of Experiments (DoE)

- Optimisation of pyrolysis/activation parameters within WP4 through statistical design of experiments
- Systematic testing of formulation variables within WP5

d) Artificial Intelligence (AI)-Assisted Formulation Development

- Machine learning-based formulation optimisation and performance prediction models
- Modelling of structure-performance relationships between WP4/WP5 through analysis of process and formulation data

e) Performance Testing of the Activated Carbon Conversion Process

- Analysis of pyrolysis/carbonisation and activation process efficiency (yield, mass/energy balance)
- Testing and characterisation of product quality parameters such as porosity, surface area (BET), adsorption capacity and purity
- Establishment of comparative performance and quality control protocols for different raw material/parameter sets

f) Validation of the Cosmetic Products to be Developed

- Stability, physical/chemical and microbiological validation testing of prototype formulations (serum, mask, cleanser)
- Clinical/consumer-based efficacy and sensory evaluation studies
- Support for product safety file and regulatory compliance processes (cosmetic product information file, safety assessment report, etc.)

5. Expected Partner Contribution and Roles

- Provide scientific/technical consultancy and applied R&D support in the relevant work package (WP4–WP7)
- Produce project outputs (analyses, models, reports, test results) in accordance with the relevant scientific/technical standards
- Contribute to project meetings, reporting processes and, where applicable, funding application preparation
- Be open to joint publications, patent applications or knowledge sharing where deemed necessary

6. Partnership Model

- As a project consortium partner (within the scope of a national/international support programme application)
- Academic collaboration (joint work, joint publication, thesis/research collaboration)

7. Application and Contact

Interested institutions/organisations are kindly requested to contact **YTÜ TTO** with a short introductory document specifying their area of expertise, relevant previous work/references and the work package they wish to contribute to (WP4, WP5, WP6, WP7 and/or one of the areas LCA, TEA, DoE, AI formulation development).

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