

Search for a Spanish Partner for a Bilateral R&D Project

Organization	
Date of Request:	September 3 rd 2026
Company name:	American University in Cairo
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SECTION 1: Entity launching the partner search

(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)

Sector	Roadway pavement
Entity mission or core functions	Scientific
Date of establishment	1919
Ownership (if public and traded, add stock exchange and ticker symbol)	Not for profit university
Total number of employees	Approx. 3,000 faculty and staff (including ~450 full-time faculty)
Number of employees in R&D	~450 full-time faculty engaged in research, supported by graduate and undergraduate research assistants; dedicated construction materials and pavement laboratories
Key products sold or services provided	Higher education (undergraduate and graduate degrees); scientific research; construction materials testing and consulting services through departmental laboratories
Entity core technical competences	Academic
Key R&D programs and activities	Pavement materials characterization; development of the Micro-Indentation and Relaxation (MIR) method — a simplified screening test for asphalt binder quality assurance validated against the Dynamic Shear Rheometer (DSR); asphalt binder aging and polymer-

	modified binder rheology; viscoelastic modeling (Hertzian contact mechanics, Prony series interconversion)
Examples of accomplishments	MIR method proof-of-concept published with ASCE (Airfield and Highway Pavements 2017); internally funded 2-year MIR validation research program covering 4 binder grades and 4 aging states with full DSR cross-validation; established track record of peer-reviewed publications in asphalt materials and pavement engineering
Company strategic orientation	Translating the validated MIR method into a deployable, low-cost screening instrument and standardized test protocol for routine asphalt binder QA/QC, positioned as a first-line screening tool with the DSR retained as referee method; technology transfer to industry and standardization (AASHTO-format draft specification)

SECTION 2: Spanish Company Profile

(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)

Profile of ideal technology partner	A Spanish company active in (a) materials testing equipment / instrumentation manufacturing, or (b) road construction, asphalt production, or pavement engineering with in-house QA laboratories. Ideally an SME or large company with an interest in developing a simplified binder screening instrument and test protocol.
Core technological competencies and expertise	Precision mechanical testing equipment design (load frames, displacement control, force sensing); embedded software and data acquisition; instrument industrialization and CE certification; and/or asphalt binder and mixture testing practice, QA/QC laboratory operations, and access to binder supply chains for field validation.
Other essential qualifications (e.g.: ownership, track records etc.)	Eligible for CDTI funding under the International Technological Cooperation Projects (PCTIs) conditions; demonstrable track record in construction materials, testing equipment, or road infrastructure; capacity to conduct Spanish-side validation testing and to carry the product to market.
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	No specific companies identified yet — open to introductions through CDTI and STDF nodal representatives.
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	AUC has developed and is validating the MIR (Micro-Indentation and Relaxation) method: a spherical indenter on a basic load frame pressed into a cast asphalt binder disk yields a force-relaxation curve that captures the binder's viscoelastic fingerprint. The method is dramatically simpler and cheaper than the

	Dynamic Shear Rheometer used in routine QA today. AUC offers the validated test protocol, the Hertzian analysis and DSR-interconversion software, and a 16-cell validation dataset (4 binder grades x 4 aging states). We seek a partner, perform Spanish-side validation on European binders, and commercialize the instrument and protocol for QA laboratories, contractors, and binder suppliers.
Interested areas of collaboration	Construction thematic area — Advanced construction technology and materials; advanced construction management and methods (quality assurance of asphalt paving materials).
Specific R&D contribution you are seeking/offering	Seeking: European binder samples and Spanish-side laboratory validation. Offering: the validated MIR test method and protocol; Hertzian contact analysis and Prony-series/Fourier interconversion pipeline; comprehensive binder-aging validation dataset; scientific supervision, joint publications, and AASHTO/CEN-format draft specification development.

Signature

Name: Dr. Ahmed Faheem

Date: August 4, 2026

Summary:

Routine asphalt binder quality assurance is dominated by the Dynamic Shear Rheometer (DSR) — a sophisticated, expensive, and operationally demanding instrument requiring specialized training, precise environmental control, and delicate specimen handling. The Micro-Indentation and Relaxation (MIR) method offers a radically simpler alternative: a spherical tip on a basic load frame, pressed into a binder disk, records a force-relaxation curve that encodes the binder's complete viscoelastic fingerprint via Hertzian contact mechanics. This proposal develops and validates MIR as a screening and pre-qualification tool for routine binder QA/QC — with the DSR retained as the referee method — across four performance grades and four aging states, using both rigorous mathematical equivalence (Prony series / Fourier interconversion) and practical empirical correlation as the dual validation framework.