



Call for the selection of 1 research contract

The University of Pisa announces public selection procedures for the award of 1 research contract in accordance with Article 22 of Law 240/2010 as set out in Annex A) to this call, in which the information sheets indicating the reference structure, the description of the research project, the specific responsibility within the project and the functions to be performed, as well as the scientific disciplinary area and information on the interview, are provided.

Deadline for submitting the application: 4th april 2026 at 1.00 p.m.

Contract duration: 24 months

All-inclusive annual administrative gross amount: € 50.000

Admission requirements:

- A PhD or medical specialisation degree.

Students enrolled in the third year of a PhD programme or in the final year of a postgraduate medical specialisation programme are also eligible to apply, provided they obtain their degree within six months from the publication date of the selection notice. Failure to meet this requirement candidates will lose the right to be awarded the research contract.

Documents to be attached:

The application must include:

- a) A research development project related to the research project specified for the selection in Annex A);
- b) A comprehensive scientific-professional curriculum containing all the necessary elements for assessing prior research activities and any relevant work experiences, in connection with the content of the research project under consideration (specifically indicating: date/duration, place of completion, etc.);
- c) For individuals with a foreign doctoral degree, an equivalence decree or determination; if the candidate already holds one, a copy of the foreign doctoral degree or a suitable certification issued by the foreign institution, confirming the components, duration, and activities of the doctoral programme undertaken to achieve the doctoral degree;
- d) Additional documents that the candidate deems useful for the selection purposes;
- e) Publications that the candidate considers relevant for the selection, considering the maximum number set for the selection, as indicated in Annex A), with a list signed by the candidate;
- f) Photocopies of the tax code and a current valid identification document.

Candidates must submit the publications they intend to present exclusively in PDF format through the dedicated section of the online procedure.

Each publication shall not exceed 30 megabytes.

Publications not enclosed with the application will not be considered by the Selection Board. Lists with links to texts are not allowed as a replacement for publications.

Applications

Applications must be submitted online only, using the following link: <https://pica.cineca.it/unipi/>

or shall be invalid. An e-mail inbox is required to login and complete the application.

Candidates can login into PICA platform using the digital identifier SPID (Sistema Pubblico d'Identità Digitale - Public Digital Identity System), selecting the University of Pisa among the available Institutions.

If candidates have no SPID, they can request it according to the procedures set forth on the website www.spid.gov.it.

Candidates can also login with the credentials issued directly by PICA platform (please note: in order to apply online, the system requires an e-mail inbox for self-registration), with their LOGINMIUR, REPRISE or REFEREES account.

Applicants should provide all the required data and upload all documents in PDF format.

The system allows saving an application draft within the application deadline, recording the online application's date and sending a receipt with an automatic reply. After the deadline, the system will not allow login nor application submission.

Each application will be assigned a unique identification number to be referred to in all subsequent communications, along with the selection code provided by the application form.

Under penalty of exclusion, the application shall be valid only if including all the required data, the copy of a valid ID and:

- if submitted without accessing with digital identifier SPID, the applicant's signature is compulsorily required;
- If submitted by accessing with digital identifier SPID, the application will be automatically processed by the system and the applicant's signature is not required.

Applicants undertake to promptly communicate in writing any variations of what declared in the application form.

The communication shall be edited in PDF format, signed and forwarded to the Rector of the University of Pisa by the Italian certified e-mail system address (P.E.C. Posta Elettronica Certificata): protocollo@pec.unipi.it or emailed to concorsi_contratti@unipi.it , within the application's submission deadline.

An applicant's valid identification document shall be annexed.

For further information on application submission, please refer to concorsi_contratti@unipi.it.

For technical problems support only, please click on the bottom link available at <https://pica.cineca.it/unipi>.

Selection procedure:

For the selection under Annex A) the Director of the Department appoints a Selection Board consisting of the head of the research project and two other members.

Candidates are assessed comparatively on the basis of the following elements:

- a) Quality, originality and innovativeness of the research development project, with reference to the research project under consideration;
- b) Relevance and significance of the research activities previously carried out, as well as any work experience, in relation to the contents of the research project subject to the selection, in addition to documented qualifications (such as, for example, grade point average, postgraduate diplomas, any contracts, scholarships, conference presentations, and other documented qualifications);
- c) Quality, originality and innovativeness of the attached publications, as well as their relevance to the research project under consideration;
- d) An interview aimed at assessing the knowledge of the basic subjects of the scientific disciplinary sector to which the subject of the research project belongs, the suitability for carrying out the research activity under the contract and for the implementation of the research project, as well as the evaluation of knowledge of the English language and/or other languages relevant to the research (as reported in the Annex A). During the interview, the Selection Board also assesses the knowledge of the Italian language for foreign candidates.

The Selection Board has 100 points available for the comparative evaluation of the candidates: 60 points can be allocated for the criteria mentioned above under a), b) and c), and 40 points for the interview.

The Selection Board may stipulate a minimum score below which eligibility cannot be awarded.

Candidates are summoned for the interview on the day and time specified in the Annex A) for the procedure.

Failure to attend an interview by a candidate is considered an explicit indication of their intention to withdraw from the selection process.

Applicants for this selection are required to consult the University website at <https://bandi.unipi.it/public/Bandi?type=COR> (on the selection procedure page) during the two days preceding the date set for the interview.

On the University website (<https://bandi.unipi.it/public/Bandi?type=COR>), in the section dedicated to the procedure, the following will be published:

- Assessment scores for criteria a), b) and c);
- The list of candidates admitted to the interview;
- Practical instructions for carrying out the interview and/or any details should the interview be rescheduled;
- The procedure approval decree and the merit ranking that takes into account the scores achieved by the candidates.

The prospective doctoral or postgraduate student may only enter into a contract after obtaining a doctoral or postgraduate medical degree. In the event that the PhD candidate or postgraduate student fails to obtain the degree within six months from the publication date of the selection notice, they will lose the right to be awarded the research contract.

Please note that the English version is given as a matter of courtesy, for the only purpose of information. It cannot be legally used in the event of a dispute or a claim arising from the interpretation of this translation and concerning the contents, a possible uncertainty, contradiction, or discrepancy. Should this occur, the Italian version of the call should prevail as the only valid. For full Italian text see: <https://bandi.unipi.it/public/Bandi?type=COR> (on the selection procedure page).

Selection code - CDR_inginf2026_6

Department of Information Engineering

GSD 09/IINF-01 "Electronics"
SSD IINF-01/A "Electronics"

Project ALERT - CUP I53C26000590006

Head of the Research Project
Prof. Giuseppe Barillaro

Research project:

Multianalyte digital sensing with QR-code microneedles for minimally invasive early diagnosis of alzheimer - ALERT

ALERT introduces a groundbreaking leap in medical diagnostics, redefining in-vivo sensing with a pioneering digital approach. This revolutionary technology centers on multianalyte digital sensing via QR-coded microneedles—engineered for minimally invasive, highly accurate, and real-time measurement of critical disease biomarkers directly from plasma beneath the skin.

Seamlessly integrating digital innovation with advanced biomedical sensing, ALERT's microneedles encode biomarker data into a scannable digital QR code, enabling instant and precise diagnostics. These microneedles operate through a unique binary fluorescence mechanism, switching distinctly "on" or "off" when biomarker concentrations cross predefined clinical thresholds. This digital paradigm eradicates the need for external calibration—a key limitation of traditional analog chemical sensors—ensuring enhanced accuracy, reliability, and ease of use in real-world applications.

With a main focus on early detection of Alzheimer's Disease (AD), ALERT tackles a pressing global health challenge, particularly urgent given the rapidly aging population. AD often remains clinically undetected for 15 to 20 years, making early diagnosis crucial for improving patient outcomes and reducing the immense social and economic burdens of late-stage management. ALERT's approach includes rigorous validation in animal models, well-defined Key Performance Indicators, advanced material synthesis, cutting-edge device fabrication, and proactive risk mitigation strategies.

Beyond revolutionizing AD diagnostics, ALERT's digital QR-code microneedle platform holds vast potential for broader medical applications, including early detection of cancer, sepsis, and infectious diseases. Its adaptability extends even further, with applications in environmental monitoring, precision agriculture, and food safety. By bridging the gap between digital technology and biomedical sensing, ALERT is poised to redefine diagnostics with industrial impact on a global scale.

Specific responsibilities within the project and functions to be performed:

Main responsibilities

- Design and development of functionalized microneedles for digital multi-analyte biomarker sensing, with particular focus on systems based on binary (on/off) fluorescence response.
- Development and optimization of sensing materials, including chemical/biomolecular functionalization of receptors for the selective recognition of target biomarkers (with emphasis on Alzheimer's biomarkers).
- Physico-chemical and functional characterization of sensing systems, including evaluation of sensitivity, selectivity, activation threshold, and long-term stability.
- Contribution to the definition and validation of the project's Key Performance Indicators (KPIs), in line with the objectives of digital sensing and early diagnosis.
- In vitro experimentation and support for in vivo activities, including device preparation and analysis of experimental data from animal models.
- Integration of the sensing system with the digital readout platform, contributing to the validation of the concept of data encoding into QR codes readable via smartphones.
- Critical analysis of experimental results, data interpretation, and proposal of optimization strategies and technological risk mitigation approaches.
- Preparation of technical reports, project deliverables, and contributions to scientific publications, as well as support for dissemination activities in both academic and industrial contexts.

- Active collaboration with consortium partners, participating in project meetings and contributing to the coordination of interdisciplinary activities.

Cross-cutting functions

- Support for project management activities, risk assessment, and evaluation of the technological robustness of the system.

- Contribution to technology transfer and assessment of the scalability and industrial impact potential of the ALERT platform.

- Continuous alignment with the objectives of early diagnosis, reliability, and clinical usability of the device.

Maximum number of publications that candidates may submit, including the doctoral thesis, if submitted: 8

Language skills:

English language

Date, time and mode of the interview:

15th april 2026 at 9.30 am in presence at the department of Information Engineering - Via Caruso, 16 - Pisa