PUBLIC NOTICE FOR THE OPENING OF A SELECTION PROCESS FOR A FAPESP POSTDOCTORAL FELLOWSHIP LINKED TO A THEMATIC PROJECT

The Federal University of São Carlos (UFSCar) announces the opening of a selection process for a FAPESP Postdoctoral Fellowship, linked to the Thematic Project titled *Interaction between brain, muscles, bones and adipose tissue: unveiling mechanisms to prevent frailty and promote healthy aging*, under the supervision of Prof. Dr. Tiago da Silva Alexandre. One (1) postdoctoral fellowship will be offered, to be immediately implemented after the selection process and FAPESP's approval.

1. OBJECTIVES

The FAPESP Postdoctoral Fellowship aims to create conditions for the temporary incorporation of promising scientists, who obtained their doctoral degree less than 7 (seven) years ago, into active research groups to contribute to the development of the project. Applications may be submitted before the doctoral degree is completed, but proof of its completion is mandatory at the time of the grant acceptance.

After this first selection, the selected candidate must:

Submit the fellowship proposal via SAGe, explicitly requesting linkage to the project by indicating the grant process number in the "Linked Process" field. A document signed by the Principal Investigator (PI) of the associated grant, agreeing to the linkage and specifying the contribution of the proposed research to the overarching project, must be included. Guidelines for submitting supplementary requests can be found at www.fapesp.br/1413.

Requests for fellowships as budget items in research grants must also comply with the guidelines at www.fapesp.br/15369.

The postdoctoral fellow's research project must be closely aligned with the FAPESP-funded thematic project.

2. FELLOWSHIP

The postdoctoral fellowship linked to Thematic Project grants may be renewed for up to 12 months, provided that the total time granted to the same fellow does not exceed 48 months.

3. CANDIDATES

- The candidate must have completed their PhD within the last 7 (seven) years, except under conditions stated in Ordinance PR No. 171/2024, and have an excellent academic and postgraduate record.
- The curriculum summary should demonstrate research potential.
- The candidate must be in good standing with FAPESP (submission of reviews, return of grant processes, submission of scientific reports and financial reports). Applications from candidates or PIs with pending issues over 60 days will not be considered.

- Candidates must be aware of all rules and procedures available at www.fapesp.br and www.fapesp.br/sage.
- Foreign candidates must ensure all necessary documentation is secured for entry and stay in Brazil via the nearest Brazilian Consulate.
- Candidates must declare if they are applying for or receiving financial support from other sources for the same research purpose.

4. REQUIREMENTS AND OBLIGATIONS

During the fellowship, the fellow must:

- Have a Brazilian CPF (individual taxpayer number) to sign the Grant Agreement.
- Be aware of the obligations stated in the Grant Agreement and signed jointly with the supervisor.
- Non-compliance may lead to cancellation of the fellowship and reimbursement of funds.
- Follow the approved research plan and development plan.
- Dedicate themselves exclusively to the project.
- Not hold any employment or receive income from any other source during the fellowship term.
- In some cases, a leave of absence from a current job may be acceptable if it allows exclusive dedication.
- Live in São Carlos, SP, Brazil.
- Remain in good standing with FAPESP.
- Notify FAPESP before accepting any other financial support related to the project.
- Not change the project without prior FAPESP approval.
- Submit Scientific Reports, reports on the progress of the proposed Postdoctoral Program development plan, Technical Reserve fund usage reports, and Financial Reports within the deadlines established in the Grant Term (Termo de Outorga), accompanied by the required documentation.
- Demonstrate a high level of academic interaction with the Supervisor and with the academic community of the Host Institution (located in the State of São Paulo), establishing a solid academic connection with this Institution.
- Not leave the Institution where the research project is being conducted without explicit prior authorization from FAPESP, via a justified request submitted by the Supervisor.
- This restriction does not apply in the following cases:
    - Field research explicitly included in the research project that justifies the Fellowship award;
    - Research internship for a period of less than one month;
    - Participation in a Scientific or Technological Meeting, with or without presentation of a paper;
    - Participation in a course relevant to the research project that justifies the Fellowship, for a duration of less than one month.
- In all such cases:
    - The Supervisor's written endorsement is required and must be kept on file by both the Supervisor and the Fellow to be presented to FAPESP if requested.
    - The leave must be informed and justified by the Supervisor in the submission form of the next Scientific Report so its relevance to the research project can be properly assessed.
    - Authorization to take leave does not imply automatic approval for using Technical Reserve (RT) funds for that purpose. For use of RT funds, the

specific rules at www.fapesp.br/4566 must be followed.
    - Acknowledge FAPESP support in theses, articles, books, abstracts, and all other forms of publication or dissemination of activities that result, in whole or in part, from the Fellowship, as stated in Clause 7 of the Grant Term and Acceptance of Fellowships, and described at www.fapesp.br/11789.
- If the research project funded by the Fellowship receives financial support from any other funding source, public or private, the Fellow must disclose and make explicit reference to this support, clearly identifying the funding source in all dissemination materials mentioned above.
- Take the necessary steps to ensure that, through the services provided by the Host Institution, the full texts of articles or other scientific communications that result, in whole or in part, from the FAPESP-funded project are deposited in the institution's scientific repository and made openly available, in accordance with the open access policy of each journal, as soon as the manuscripts are accepted for publication or as early as possible within the constraints of each journal, and at most within 12 months of publication. FAPESP's Open Access Policy is available at www.fapesp.br/12632.
- Immediately notify FAPESP, via the Supervisor, of the signing of any contract, appointment to any position, assignment to any function (paid or unpaid), change of residence, or any interruption in research activities.
- Promptly assess whether the execution of the project has produced or may produce results that are potentially subject, in whole or in part, to protection via patents, utility models, industrial designs, software, or any other form of intellectual property, following FAPESP's Intellectual Property Policy available at www.fapesp.br/pi.
- Provide peer reviews, free of charge and within the deadline set by the Foundation, in matters within their expertise when requested by FAPESP.
- Be aware of and comply with the FAPESP Code of Good Scientific Practice, available at www.fapesp.br/boaspraticas.
- Ensure, together with the supervisor, the proper management of data produced during the project, in accordance with the Data Management Plan associated with the Fellowship project.
- Always use the most recent versions of rules, forms, and procedures, available at www.fapesp.br and www.fapesp.br/sage.

5. SELECTION PROCESS

- Applications must be submitted via email to Prof. Dr. Tiago da Silva Alexandre: tiagoalexandre@ufscar.br
- Application period: June 10, 2025 – July 10, 2025
- Submit in a single PDF file:
    - Curriculum vitae (maximum 5 pages), following FAPESP's *Súmula Curricular* format. Include: ORCID link, Scopus and Web of Science author profiles, and Lattes CV link (for Brazilian candidates only). Instructions here.
    - Include relevant info such as awards, research internships abroad, scholarships, research group participation, etc.
    - Clearly describe the candidate's role in published papers, societal impact of research (if applicable), and technical expertise in epidemiology, STATA, and quantitative methods (list specific methods).
- Candidates with suitable profiles will be invited for an interview. The selected candidate will then be recommended to FAPESP. Approval depends on FAPESP's internal evaluation timeline.

- **Required qualifications**:
    - PhD completed within the last 7 years.
    - Proficiency with STATA software.
    - Strong oral and written communication, teamwork skills, availability for in-person seminars and teaching activities.
    - First-author publications in high-impact international journals.
    - Knowledge of aging processes in muscles, bones, and the brain.
    - Experience in epidemiology and longitudinal data analysis using regression, survival models, and generalized linear mixed models.

6. TIMELINE

- **Application period:** June 10 to July 10, 2025 to tiagoalexandre@ufscar.br
- **Fellowship duration:** 12 months

6. DOCUMENTS REQUIRED FOR SECOND STAGE (APPLICATION TO FAPESP VIA SAGe)

- Research project (original, well-structured, and clearly demonstrating scientific contribution).
- CV summary of supervisor.
- CV summary of candidate.
- Official Master's transcript, with full course names, grades, failures or withdrawals, and minimum passing grades or university statement.
- Official PhD transcript, same criteria as above.
- PhD completion certificate (can be submitted later, before grant acceptance).
- Proof of job leave or resignation (if applicable, also allowed to submit later before grant acceptance).

8. THEMATIC PROJECT

Interaction between Brain, Muscle, Bone, and Adipose Tissue: Uncovering Mechanisms to Prevent Frailty and Promote Healthy Aging

Principal Investigator: Tiago da Silva Alexandre
http://lattes.cnpq.br/5393622641681701

Host Institution: Federal University of São Carlos – São Carlos, São Paulo, Brazil

Abstract: One of the major scientific challenges in aging research is to explain changes in the crosstalk mechanisms between muscle, bone, adipose tissue, and the brain that may impair skeletal muscle, increase the risk of dementia and frailty, and lead to other adverse outcomes. However, answers to many current questions depend on expensive and complex methodologies, access to advanced technology, multidisciplinary teams, and international collaborations, as they must be tested on a large scale and in real-world, non-controlled settings, outside clinical trials. Thanks to the Principal Investigator's collaboration with the Department of Epidemiology and Public Health at University College London, this proposal will use data from the UK Biobank, which includes brain and whole-body magnetic resonance imaging (MRI) data from over 40,000 individuals, linked to records from the UK National Health Service via the Hospital Episode Statistics (HES) database. The project will also utilize data from the English Longitudinal Study of Ageing (ELSA) and the Brazilian Longitudinal Study of Aging (ELSI-Brazil). Using these data, the objectives of this proposal are to: 1) Analyze, using machine learning and deep learning, the extent to which the reduction in cortical and subcortical anatomical structures and brain activation (all measured by MRI) is associated with loss of muscle mass, increase in intramuscular fat infiltration, and decline in muscle strength; 2) Assess how increases in visceral and subcutaneous fat contribute to greater intramuscular fat infiltration and decreased thigh muscle mass, as measured by MRI; 3) Evaluate the impact of the combination of reduced muscle mass and high intramuscular fat infiltration on loss of strength and mobility, risk of falls and fractures, disorders of carbohydrate and lipid metabolism, and on the incidence of cardiovascular diseases, dementia, frailty, and cardiovascular mortality; 4) Analyze how this combination affects bone mineral density and trabecular bone score (measured by MRI), and how these conditions—whether occurring together or separately—increase the risk of falls, fractures, and hospitalizations; 5) Determine whether the main results obtained from the UK Biobank and HES data (which include much more complex measurements) could be used to train machine learning models using data from ELSA and ELSI-Brazil, with the aim of developing predictive models of frailty and healthy aging, while accounting for socioeconomic differences between the UK and Brazil. Hypotheses: 1) There is a pattern of anatomical changes—reductions in cortical and subcortical volumes—along with altered brain activation patterns that reduce muscle mass, increase intramuscular fat infiltration, and lower muscle strength; 2) Increases in visceral and subcutaneous fat contribute to reduced muscle mass and increased intramuscular fat infiltration in the thigh; 3) The combination of low muscle mass and high intramuscular fat infiltration in the thigh is associated with decreased muscle strength and mobility, higher risk of falls, metabolic disorders, increased incidence of cardiovascular disease, dementia, frailty, and cardiovascular mortality; 4) The combination of reduced muscle mass and increased intramuscular fat is linked to lower bone mineral density and trabecular bone score, and a higher risk of falls, fractures, and hospitalizations; 5) The complex measurements and outcomes obtained from the UK Biobank and HES can inform machine learning models that use simpler data from longitudinal studies to build predictive tools for frailty and healthy aging that are applicable in clinical practice.

Keywords: Aging, Muscle, Gerontology.

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