



UNIVERSITÀ DEGLI STUDI DI ROMA “FORO ITALICO”

N.B. Please note that only the Italian version of the present call issued with Rector’s Decree is legally binding; the English version is provided for information only

Call for Applications to the PhD Program in “Human Movement and Sport Sciences” University of Rome “Foro Italico” 39th Cycle – Academic year 2023-2024

Art. 1 Institution

1. Coherent with current Italian laws, as well as with resolution n° 13 of May 15th 2023 and resolutions n° 16A and 16B of May 17th 2023 approved by the University Administration Board, the University of Rome “Foro Italico”
2. Considered the formal requirements deriving from PNRR financial support including those related to, but not limited to, facilitating FAIR data and Open science results circulation, to conform to DNSH principle, in accordance with E.C. note 2021/C58/01 and the need to prevent gender inequalities or any other form of discrimination, it is open the call for the admittance to the Ph.D course in Human Movement and Sport Sciences with the University of Foro Italico, Rome, Italy, **39th cycle**.
3. The research areas of the PhD program 39th Cycle are described in **Annex A** enclosed at the bottom of this document.
4. The PhD program is open to 14 doctoral student positions (8 with financial scholarship, 4 *within the PNRR program*, 2 without financial scholarship).
5. The beginning date of the PhD program – **39th cycle is November the 1st of 2023**; the duration of the program is three consecutive academic years.

The call is open pending the final formal approval in agreement with D.M. 226/2021; in case the proposal would not be approved by central offices, the call will not be valid and candidates will be timely notified.

Art. 2 Admission and Selection Criteria

To be admitted and selected for the PhD program, applications will be considered and evaluated according to the requirements and criteria described in the following art. 3, 4, 10, 12, and in Annex A enclosed at the bottom of the document.

Art. 3 Pre-admission requirements

Italian or foreign citizens who have earned a Bachelor Level Degree and a Graduate Level Degree abroad must comply with the following pre-admission requirements in order for their applications to the PhD program to be considered:

1. Must have earned their university degrees by the time the application is presented. Alternatively, those who are in the process of earning the Graduate Level Degree at the time the application is presented may also apply to the present call only in case the Graduate Level Degree is earned by and no later than October, the 27th of the current solar year.
2. Must fill out and provide the information reported in Annex B. The Faculty of the PhD program will evaluate the information provided in **Annex B** and the applicants’ admissibility to the admission



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and selection protocols. If necessary, the Faculty may require additional information from the applicants to clarify their position in the admission and selection protocol.

Art. 4 Admission requirements

Application expires mandatorily on September 5th, 2023, 10:a.m. (local time).

In order to be considered for the selection in the PhD program, all applications must comply with the following admission requirements by providing :

1. Information about Graduate Studies including the title, grades and university credits for each teaching course followed during the Graduate University Program; the title of the thesis and the name of the thesis supervisor; the final mark of the Graduate studies Degree (if any); the applicant provides this information in **Annex B**;
2. A Curriculum vitae (the EU format is suggested)
3. Two letters of reference written by two university scholars or **non**-university experts in the field. The authors of the reference letters cannot be members of the Faculty of the PhD program the candidate is applying to. Furthermore, the letters of reference, which need to be written in English or in Italian, must be signed by their authors and e-mailed to the following electronic address: ufficio.dottorati@uniroma4.it by and no later than the call deadline (see Annex "Instruction for preparing and sending the letters of reference"). The applicants provide the two names of the reference letters' authors in **Annex C**.
4. A research project, consistent with one of the general topics listed in **Annex A** or with the specific research title also reported in Annex A. The research project must be prepared and written closely following the instructions and formats reported in the Annexes "Research Project Form" and "Research Project Instruction".

Or

5. A research project on one of the following four supplementary scholarship (**PNRR – DM 118, 2/3/2023**):

- 1 *"Innovation and sustainability in water management: focus on buildings, sport facilities and swimming pools, physical activity, rehabilitation and wellness" - (1 PNRR scholarship – DM 118);*
- 2 *"Development and implementation of non-pharmacological treatments based on innovative interdisciplinary cognitive-motor interventions to address mental disorders in adults and the elderly." - (1 PNRR scholarship – DM 118);*
- 3 *"Physical exercise for health improvement in people with multiple sclerosis: implementation of an innovative protocol in telerehabilitation" - (1 PNRR scholarship – DM 118);*
- 4 *"Impact of physical exercise on the onset and progression of neurodegenerative diseases: role of alternative splicing in amyotrophic lateral sclerosis" - (1 PNRR scholarship – DM 118)*

Incomplete applications, including those lacking mandatory attachments, will not be considered. Successful applicants for PNRR scholarships will mandatorily spend a research period abroad lasting at least 6 months and not longer than 12 months.



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The research project can be written either in Italian or in English languages. It must be attached and uploaded following the appropriate steps in the on-line application. The research project must have a length not less than 12 000 and no more than 34 000 characters (spaces included) and must include the following elements: 1. Aim of the research; 2. State of the art; 3. Working hypothesis; 4. Methods and rationale for the chosen methods; 5. Novelty of the project; 6. References

Art. 5 Additional non-mandatory qualifications

All applicants may discretionarily provide the following non-mandatory information in their applications:

1. Additional university credentials, such as master university degrees, post-graduate or advanced teaching courses, other PhD program degrees, research fellowships, positions, or appointments held within university or non-university research institutions; (this information is provided by the applicants through a self-certification statement in **Annex C**)
2. Copy of any scientific publication or book chapter, already published or in press. In this latter case, applicants must provide a statement by the Journal or book Editor to confirm the in-press status of the publication; (publications and statements should be uploaded in electronic format)

Art. 6 Additional information about the admission and selection procedures

1. All applicants must have earned their university degrees by the time the application is presented and no later than the closing deadline of the call. Alternatively, those who are in the process of earning the Graduate Level Degree at the time the application is presented may also apply to the present call only in case the Graduate Level Degree is earned by and no later than October, the 27th of the current solar year.
2. All applicants must provide the admission requirements and any additional non-mandatory qualifications listed in the above art. 4 and 5 by the time the application is presented and no later than the closing deadline of the call.
3. Those applicants who are in the process of earning the Graduate Level Degree at the time the application is presented must, by and no later than the 27th of October 2023, provide – only in case they are admitted as doctoral students to the PhD program – a self-certification that they have earned their university degree. This self-certification must be presented under penalty of losing the right to participate to the PhD program) by November the 8th 2023 to the ‘Ufficio Dottorati; University of Rome “Foro Italico”, Piazza Lauro De Bosis 15, 00135, Roma.
4. Those Italian or foreign citizens who have earned the University Bachelor and Graduate Degrees abroad and who are admitted as doctoral students to the PhD program must provide additional documentations of their University Degrees. In particular, they must provide, during and no later than the four consecutive months following the date of registration to the PhD program, the following documentation:
 - a) Certificate of the University Bachelor and Graduate Level Degrees issued by the home university;
 - b) Certificate of the Examinations and corresponding grades issued by the home University;
 - c) The certificates described in the above points a. and b. must be translated and authorized by an office of the Italian Consulate or Embassy in the country where the University Degrees have been earned.
 - d) The office of the Italian Consulate or Embassy in the country where the University Degrees have been earned also must issue a declaration conforming to the “Declaration of value of the



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qualification in situ.” In this declaration, the aforementioned office must state that the University Degrees earned by the candidate are valid credentials or qualifications for being admitted or entering a PhD program in the country where the University Degrees have been earned.

In the eventuality of noncompliance with the above request, the newly accepted PhD student will lose the right to participate to the PhD program and his or her participation will be terminated. Furthermore, the newly PhD student must return any financial stipend that was offered during his or her participation to the PhD program.

5. All applicants who are admitted as doctoral students to the PhD programs will be subject to a “verification protocol” by the University Administration designed to verify that all documentation that has been presented by the applicants is truthful and conform to the requirements set forward in this binding document. Once this verification protocol has been completed, the University Administration may - at any time – deliberate the exclusion of any applicant who has been considered unfit to be part of the PhD program.

Art. 7 Non-eligibility for financial fellowships

1. The financial fellowships provided by the PhD program cannot be assigned to those applicants who have been doctoral students in other PhD programs or in prior editions of this PhD program.

Art. 8 Instructions for presenting the Application to the PhD program

All documentation provided by the applicants should be uploaded online by and no later than **September the 5th 2023, at 10 a.m.** (Italian time) by entering the University webpage www.uniroma4.it ; click on “Utilità”; select “Accesso studenti e docenti” .

1. Applicants will first register providing mandatory personal data (selecting **Registrazione** in **Area Riservata**. After obtaining username and password, will then login, go to **Segreteria, Test di Ammissione** following the instructions. The documents should be uploaded using the “Sfogliare” instruction.

2. Disabled applicants and applicants with learning disabilities can have assistance (as indicated by current Italian laws). They must make a request – by **September the 5th 2023, at 10 a.m.** - of the specific assistance they require or wish to allow them to properly participate and complete the selection procedures. This request must be submitted to both tullio.zirini@uniroma4.it and daniela.brizi@uniroma4.it It is mandatory that the request includes: certification attesting one’s own handicap condition or status, corroborated by complete documented proof of the relative diagnosis (this will be necessary for establishing the congruence of the request) or, in alternative, the diagnostic certification. Furthermore, such documentation will have to include the candidate’s declaration, in conformity to Italian Law, that all copies of certificates being provided comply with and are copies of their corresponding original documents.

This University will evaluate all requests taking into close consideration legal norms and feedback from the Rector Delegate for Disability, with the possibility of additional documentation being requested on a case-to-case basis.

All the documents requested for the application to the PhD program (except the letters of references, see below) must be sent by online upload following the above listed instructions.

The uploading procedure must be completed by the call deadline of **September the 5th 2023, at 10 a.m.** (Italian time). Applicants may remove or substitute any uploaded document only prior to this deadline.



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The letters of reference must be sent by e-mail by and no later than the call deadline to the address: ufficio.dottorati@uniroma4.it (see Annex "Instruction for preparing and sending the letters of reference" for details).

All application documents submitted electronically must be written in Italian or in English. Documents in other languages must be translated into Italian or into English under the applicants' responsibility.

Art. 9 Colloquia with selected applicants

1. In line with evaluation criteria detailed in the following art. 12, applicants will eventually be selected for colloquia after the evaluation of their documentation by an Evaluation Committee. In particular, applicants who receive a score of at least 17/25 will be admitted for participating to colloquia which will complete the selection procedure. The list of applicants who will be admitted to the colloquia will be published **by September the 15th** in the web site of University of Rome "Foro Italico" www.uniroma4.it at "Accesso rapido > Dottorati".

2. The characteristics of the colloquia are described in Annex A enclosed at the bottom of this document. The colloquia will be held starting on **September the 25th 2023**.

3. Applicants who reside abroad and who – in case of being selected - would like to participate to the colloquia via Skype must send by **September the 5th 2023 (at 10 a.m.)** an electronic email to ufficio.dottorati@uniroma4.it in which they request to be interviewed via SKYPE and provide a Skype address.

Art. 10 Composition of the Evaluation Committee

The Evaluation Committee that will be responsible for the selection of the PhD students will be nominated by the University Rector in accordance with the Faculty of the PhD program and will include a minimum of three university scholars belonging to the Faculty of the PhD program.

Art. 11 Evaluation Criteria, Ranking and Selection of PhD candidate

1. The evaluation of both admission requirements and non-mandatory qualifications will rely on a scoring system based on a maximum of 25 points, according to the following general criteria and a set of additional specific criteria that are reported in Annex A:

a) Admission requirements, with the exception of the Research Project (for a maximum of 7 points: up to 4 points for the final mark of the Graduate studies Degree (average of the examinations' grades in the case of undergraduates); up to 3 points for CV);

b) Additional non-mandatory qualifications (for a maximum of 3 points: up to 2 for publications; up to 1 for additional university credentials)

c) Research Project (for a maximum of 15 points)

Any further criteria for the evaluation might be formulated by the Evaluation Committee in its preliminary meeting.

A minimum total score of 17/25 is necessary for applicants to be selected for the following phase of colloquia.

2. The colloquia will be evaluated by utilizing an additional scoring system based on a maximum of 25 points (presentation and discussion of the research project, up to 14 points; previous research experience, up to 2 points; motivations for selecting the specific PhD program, up to 4 points; proficiency of English language, up to 5 points).



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3. PhD applicants will only be included in a final ranking of eligible students in case their admission requirements and colloquia are evaluated with a minimum score of 30/50.
4. The Evaluation Committee will predispose a final ranking of the applicants. The first 8 positions of the ranking will be with scholarship, and the next 2 positions will be without scholarship.
5. In case of applicants with identical final scores, the Evaluation Committee will apply a criterion by which candidates are ranked in a descendent order from the youngest to the oldest.
6. PhD fellowships will be assigned to those applicants who are in the first ranking positions regardless of their nationality.
7. The applicants admitted to the PhD program must register to the program by and not later than the terms specified when the ranking is published. Those who did not register by this time are considered as withdrawals, and their ranking positions will be taken by the first eligible candidates in the ranking. Applicants admitted to the PhD program that want to withdrawal must provide immediately written communication to allow reassignment of the position.
8. In case of PhD applicants who are in the first ranking positions and who are non-eligible for receiving the PhD fellowship or waive their right to receive the fellowship, the PhD fellowship will be assigned to the first eligible candidate in the ranking.
9. The outcome of the Committee' evaluation work will be published on the following University website www.uniroma4.it selecting "Accesso rapido >Dottorati".

Art. 12 Public Service employees

A State employee who has been admitted to the PhD program and who requests to be assigned to the condition of unpaid "leave of absence" will be granted his or her request by the Employer, in full compliance with norms, regulations and work demands of the Employer.

Art. 13 Enrolment and registration procedure

After the selection of the PhD candidates who are admitted to be part of the PhD program, these doctoral students must register to the program by following and complying with the procedure described on the webpage: www.uniroma4.it selecting "Accesso rapido > Dottorati".

Art. 14 Tuition and Fees

1. Doctoral students must pay a university tax of €16,00 plus a tax for Diritto allo studio (about €140,00).

Art. 15 Fellowships and budget for research activities

1. The gross yearly amount of the doctoral fellowship is € 16.243,00; a portion of this amount covers tax contributions complying with state and retirement funds regulating student income.
2. The PhD fellowship is offered to students who receive monthly payments at the end of each month. The first monthly payment is issued after verifying the regular attendance by the doctoral students to the program activities.
3. The PhD fellowships must be the only type of scholarship that the PhD students can have during their participation to the PhD program, with the exception of scholarships that are issued by national or international agencies for research or study activities the PhD students complete abroad.
4. The amount of the PhD fellowship will increase of 50% during research periods the doctoral students will spend abroad. This rule applies only in case of a research period abroad lasting from a minimum of one month to a maximum of eighteen months.



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5. Each doctoral student may receive, starting with the second year of the program, a research budget corresponding to 10% of the PhD scholarship amount described in the above point 1 to pursue his or her research activities.
6. PhD students who are not assigned with a PhD fellowship may also benefit from additional financial support through professional appointments stipulated with university or other institutions on topics of interest to the Doctoral program.
7. Each PhD student who has been assigned to receiving the PhD scholarship will be yearly reviewed, and his or her fellowship will be yearly renewed only in case of complying with the activities that are expected from PhD students during the program.
8. PhD students who should decide to withdraw from the program or to interrupt the financial fellowship they have been assigned must return any funding they have received by the university during the current year.

Art. 16 Duties and Rights of PhD students

1. Doctoral students must attend the PhD program and carry out its planned study and research activities on a full-time basis. Once the PhD program has begun, its PhD students cannot be enrolled or participate to other PhD programs, academic courses, specialization schools, or Bachelor's and Master's programs, either in Italy or abroad, with the only exception being special authorizations issued by the Italian University Ministry.
2. Ph.D students enrolled in the PhD program cannot have any professional or work commitments in other institutions in case these commitments interfere or do not allow the PhD student to comply with all the requirements and activities of the program. In any case, any other commitment will require a formal approval and authorization by the Faculty of the Doctoral program.
3. All PhD students enrolled in the program will be yearly evaluated as to their compliance with the program's requirements and activities. In case of a negative evaluation, the PhD Faculty is authorized to exclude – upon explicit motivations - the PhD students from the program.
4. Students of the PhD program can provide tutoring or teaching assistance (for a maximum of twenty hours per PhD year) to Bachelor or Graduate students of the University. These activities must be authorized by the PhD Faculty and will not be a source of additional income.
5. All PhD students may be the beneficiary of additional financial aid according to specific norms that are regulated by Italian laws.
6. PhD students may be beneficiary of particular support and assistance in case of maternity, paternity or illness as regulated by Italian norms or laws.
7. PhD students may request a “leave of absence” to the PhD faculty in case of maternity, paternity, illness, or study or work opportunities. The PhD faculty will deliberate upon this request. If the request is approved, the PhD students will be allowed to complete the PhD program according to specific regulations and timeframe put forward by the faculty of the PhD program.
8. The PhD faculty will include a student representative of the PhD students who will be integral part of the faculty's activities concerning educational or organizational issues.

Art. 17 Earning of the PhD Degree

1. The PhD Degree is earned upon a positive evaluation of a final PhD thesis significantly contributing to scientific progress of a specific field.
2. The PhD thesis must include an abstract, written both in Italian and English language. The body of the PhD thesis document may be written in either Italian or English language. Upon filing their PhD



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thesis, PhD students must also prepare and file a report summarizing all the research activities they carried out during the entire PhD program, including scientific publications or conference presentations.

3. The PhD thesis is reviewed and evaluated by at least two university scholars, from either Italian or non-Italian institutions. These two scholars cannot be chosen from the scholars who have been involved in the selection of the PhD students who participated in the program

4. The two scholars of the above point 3 must prepare and write a formal evaluation of the PhD thesis, by which the PhD students are eventually admitted to a formal PhD thesis discussion. In case the admission to a PhD thesis discussion is not issued, the two scholars must clarify the necessary additional work they require for improving the PhD thesis and set a timeframe that cannot exceed six months for this additional work. At the end of the timeframe set by the two scholars, the PhD students are in any case admitted to the PhD thesis discussion, and the two scholars must provide an updated report on the PhD thesis.

5. The PhD thesis discussion is a public session coordinated by a Thesis Committee nominated by the Rector of this University upon a suggested list proposed by the PhD faculty. The Thesis Committee includes by at least three university scholars from either Italian or non-Italian university institutions who are experts in the thesis field.

6. At the end of the thesis discussion, the PhD student is awarded with the title of "Doctorate" in case his or her thesis has been evaluated positively by the Thesis Committee, which must in any case provide a written evaluation of the PhD thesis.

7. The PhD Degree is formally earned by a statement issued by the Rector of this University. The PhD doctorate may request a formal copy of the Rector's statement to the university administration.

8. The PhD degree might be accompanied by the additional certification of "Doctor Europaeus" issued by the university administration, in respect of Italian laws and regulations pertaining this matter.



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Art. 18 Processing of personal data

SHORT INFORMATION NOTICE PURSUANT TO ART. 13 AND 14 OF REGULATIONS (EU) 2016/679 (GENERAL DATA PROTECTION REGULATIONS - GDPR)

This notice provides main information on personal data processing by the Università degli Studi di Roma "Foro Italico" ("University").

All personal data provided in the present form shall be processed by the University, in automated and/or manual manner, with methods and tools aimed at ensuring the best security and confidentiality and protection, in contexts that do not violate personal dignity. Collected data are stored safely and in a protected way according to filing obligations imposed by applicable legislation.

Provision of personal data is necessary to perform the purposes referred to in the complete information notice on personal data processing published at the following link : <http://www.uniroma4.it/?q=taxonomy/term/263> (Informativa per i partecipanti a concorsi e selezioni di accesso ai corsi attivati dall'Ateneo). For further information, we invite interested persons to read it.

Data Controller is the Università degli Studi di Roma "Foro Italico" – Piazza Lauro de Bosis, 15 – 00135 ROMA – privacy@uniroma4.it – rettorato@pec.uniroma4.it.

The University has appointed Ing. Ingrid Cristina Giuli Bicescu as Data Protection Officer, who can be contacted at the following emails: dpo@uniroma4.it - privacy.uniroma4@pec.it.

Pursuant to art.15-22 of GDPR, Data Subjects can gain access to their data at any time and correct any information that is inaccurate or incomplete or have it deleted. They may lodge a complaint with the Data Protections Authority (Garante Per La Protezione Dei Dati Personali, Piazza Venezia 11, Roma, protocollo@gpdp.it <https://www.garanteprivacy.it>).

Final notes

Any other detail concerning the matters summarized in this document may be acquired by referring to current Italian laws and this University's Regulations concerning the activation of PhD programs.

The administrative personnel who is responsible and manager for the matters summarized in this document is: Sig. Marco Di Giustino – Area servizi agli studenti – email: ufficio.dottorati@uniroma4.it



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Annex A

PhD Graduate Program	Human Movement and Sport Sciences
Chair	Prof. Francesco Felici
Application Deadline	September, the 5 th 2023 (10 a.m.)
Deadline for the selection of candidates for the colloquia	September, the 15 th 2023
Beginning day of the colloquia	September, the 25 th 2023 (10 a.m.)

The general topics of the PhD. are listed below. Details for each area about research methodologies and about its main faculty scholars also are indicated. In the Research Project Form, the applicant must clearly indicate the number / area which he/she envisions the research project belongs to. The applicant must prepare a new, personally thought out, research project on a topic selected from and coherent with one of the numerous research themes reported within the chosen area, following the Research Project Instruction. The research project will be used to evaluate the applicant’s scientific competencies. Should the candidate be selected to be part of the PhD. program, the research project he or she had prepared will not necessarily be supported by the selected research area’s laboratory.

1. Functional Evaluation and Analysis of Sport Performance

Supervisor: prof. Laura Capranica, prof. Maria Francesca Piacentini

The research focuses on theoretical and applied aspects of sport, exercise and ergonomics in the life course, with particular reference to their determinants, performance models, training methodology, and factors enhancing sport practice. Research themes include: 1) biological, motor, cognitive, technical and tactical aspects for the analysis to optimize performance and to prevent overtraining; 2) training methods for health maintenance and improvement of athletes and of the general population in relation to the age, gender and activity level of the individual; 3) the evaluation of the sport development and sport principles. These research topics will identify the key factors for the performance and functional evaluations of different populations (athletes, women, old individuals, and children). Specific research projects could encompass both controlled (laboratory) and ecological (field) conditions.

Methods. Laboratory and field multi-disciplinary research approaches, including individual, inter-individual, and environmental variables. Analysis of motor and technical-tactical performance models of official and simulated competitions and during training sessions, with particular reference to the physical/sport levels, as well as the gender and age of the individuals.

2. Exercise Physiology

Supervisor: prof. Ilenia Bazzucchi, prof. Francesco Felici, prof. Massimo Sacchetti; Tutor: prof. Paola Sbriccoli

Characterization of the activity of single motor units. Motor control and neuromuscular adaptations to exercise in able-bodied individuals and special populations (the elderly, individuals with orthopedic, metabolic and neurological diseases). Neuromuscular control models. Neuromechanics and motor control in sedentary individuals and in elite athletes. Neuromuscular changes due to



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overload in humans. Non-invasive assessment of muscle damage and recovery. Exercise and diabetes. Exercise protocols and lipid metabolism. Physiological and performance aspects of cycling. Sports nutrition. Physiology of training and endurance performance. Ventilatory control during exercise. Wearable devices for monitoring physiological parameters during physical activity and exercise.

3. Biology and Genetics of Human Movement

Supervisor: prof. Daniela Caporossi, prof. Maria Paola Paronetto; Tutor: prof. Ivan Dimauro

Cellular and molecular mechanisms underlying control, response and adaptation to movement, and their involvement in aging and neuromuscular diseases, including Amyotrophic Lateral Sclerosis (ALS). Research methodologies involve both “*in vivo*” protocols on humans and animal models and “*in vitro*” neuronal and muscular cellular models. Specific competences are: a) “omics” of movement and movement-related diseases; b) co- and post-transcriptional regulation of gene expression induced by signal transduction pathways, also considering alternative splicing changes.; c) role of the redox homeostasis (antioxidant systems, redox signaling, oxidative stress response proteins) in the skeletal muscle biology and in the systemic and specific adaptation to exercise.

Methods: Primary and established cell cultures; DNA, RNA and protein extraction, purification and analysis (SDS PAGE, western blot analysis, quantitative RT-PCR); Cytofluorimetry; Conventional and Confocal microscopy (cytogenetic, immunohistochemistry; comet assay); Cloning; Expression and purification of recombinant proteins.

4. Endocrinology

Supervisor: prof. Paolo Sgrò; Tutor: prof. Clara Crescioli

Evaluation and characterization of endocrine, immunologic and metabolic parameters involved in different physical exercise- and sport-induced adaptation in specific endocrine systems (e.g., hypothalamic pituitary gonad-, thyroid-, adrenal axes) and target tissues (e.g., bone, muscle, adipose), in healthy subjects or in patients affected by endocrine and metabolic diseases; the investigation will be throughout different life stages and after taking substances (e.g., use and abuse of non prohibited and prohibited substance, nutritional supplements). The afore mentioned research, performed in collaboration with external research units, focuses on prevention of endocrine system alteration (e.g., reproductive system, metabolism) and maintenance and/or recovery of individual wellbeing-health in endocrine-metabolic disease. Studies on the role of physical exercise in controlling/correcting hormonal (paracrine and endocrine) and inflammatory mechanisms involved in the pathogenesis of endocrine-metabolic diseases related to sedentary lifestyle are included. Translational research for evaluation and characterization of biomediators and molecular mechanisms (e.g., endocrine-metabolic, inflammatory, etc.) involved in physical exercise- and sport-induced adaptation and/or in the pathogenesis of sedentary-related diseases and skeletal-muscle diseases will be performed using experimental cellular models (e.g skeletal muscle cells).

Methods: Cycle-ergometer, Metabolimeter, Body composition analysis (e.g., bioelectrical impedance analysis, adipometry), Extraction, purification and analysis of DNA, RNA and proteins



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(e.g., agarose gel electrophoresis, western blot, PCR/qPCR); ELISA and Luminex multiplatform-based assays, immunofluorescence (BIOPLEX).

5. Sports Medicine

Supervisor: *prof. Paolo Borrione* **Tutor:** *prof. Chiara Fossati*

Physiological mechanisms of adaptation to exercise, both hormonal and cellular, with particular regard to the maintenance of health and wellbeing. The promotion of health, individual well-being as well as improving the quality of life through an healthy lifestyle. Health issues related to the practice of sports activities, with particular reference to the prevention and therapy of pathological or para-physiological conditions related to sport activities or a wrong lifestyle. Trans-thoracic echocardiogram and functional assessment of athletes for the screening of heart conditions related to sudden cardiac death. The prevention of doping as well as behaviors potentially dangerous to health in sports. Next generation anti-doping research. Physical activity in primary and secondary prevention of chronic disorders. The role of physical exercise in musculoskeletal system pathologies. The effects of physical exercise in the elderly and its role in successful aging. Physical exercise, brain aging and neurodegenerative diseases. Oxidative stress and physical exercise.

Methods: Electrocardiography (basal, stress test, 24-hour Holter monitoring), Trans-thoracic echocardiography, Spirometry, Impedance monitoring, Telematic monitoring, Hematology, Application of growth factors, Isometric Dynamometry, Cognitive screening.

6. General Pedagogy and Special Pedagogy

Supervisor: *prof. Emanuele Isidori*. **Tutor:** *prof. Angela Magnanini, prof. A.G.A. Naccari*

Qualitative and quantitative research methods in sport education; sport pedagogy; sport values; physical education teachers and sport coaches training; sport and cultural studies; tourism, sport and leisure education; Olympic studies; philosophy, epistemology and ethics of sport; physical activity and lifelong learning; bodily and expressive mediation education; analysis of developmental tasks and educational objectives that can be pursued through different physical activities (in particular the artistic and playful ones) in the various life cycles; inclusive physical education and school, inclusive sport, sports pedagogy aimed at people with disabilities.

Methods: grounded theory; action research; case studies; observation; personal constructs; interviews; questionnaires; graphic-pictorial, choreographic and/or narrative elaborations of the movement experience.

7. Bioengineering and Neuromechanics of Human Movement

Supervisor: *prof. Giuseppe Vannozzi*; **Tutor:** *prof. Elena Bergamini, prof. Valentina Camomilla, prof. Andrea Macaluso*

Advanced movement analysis methodologies and protocols, based on stereophotogrammetry or on wearable inertial sensors, to provide an accurate description of human movement and its underlying mechanisms in physiological and pathological conditions, during daily life activities, manual work, and in sport.

Motion capture. Soft computing techniques and models for high resolution movement analysis. Monitoring systems for health and well-being. Musculoskeletal modeling of the human body in motion for the evaluation of motor function.



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Gait analysis in special populations. Assessment of motor competence in the typically developing child and in movement disorders. Sport biomechanics for performance analysis and injury prevention. Ergonomics.

Neuromuscular control and adaptation to exercise in special populations (elderly, orthopedic and neurological patients). Neuromechanics applied to sport and rehabilitation. Postural adjustments in healthy and pathological subjects. Kinematics, kinetics and metabolic cost of human locomotion. Integrated neurophysiological approaches for the assessment of motor and cognitive interference in human walking.

Methods: Stereophotogrammetry, dynamometry, electromyography, wearable inertial sensors, calorimetry, neuromuscular electrical stimulation, functional near-infrared spectroscopy.

8. Psychological and Social Processes in Sport Experience and Performance

Supervisor: prof. Arnaldo Zelli; Tutor prof. Luca Mallia, prof. Francesca Romana Lenzi

The core scientific focus of this area is on the motivational, cognitive and emotional processes that can characterize and intervene in sport experience and performance and also account for individual differences in these phenomena. This focus heavily relies on well-grounded theoretical models in personality psychology, social psychology and sport and exercise psychology. These core scientific interests also require a parallel attention to the broad sociological contexts in which sport experience and performance are embedded, as they also represent “events” that are the expression of a complex interplay among cultural, social, and interpersonal levels of analysis.

Methods: Longitudinal research designs and assessment instruments ranging from “explicit” to “implicit” psychological measures to study the relations among attitudes, cognitive processes and behavioral outcomes.

9. Cognition and Action Neuroscience

Supervisor: prof. Francesco Di Russo; Tutor: prof. Sabrina Pitzalis

The laboratory (www.researchgate.net/lab/Francesco-Di-Russo-Lab) deals with:

- Neural bases of human action in interaction with the environment (perceive to act).
- Brain correlates of cognitive and motor proactive processes (preparation, anticipation, prediction) and reactive functions (perception, attention, execution, sensory feedback, and error management).
- Cognitive-behavioral benefits and brain markers of the physical exercise' effects in the life cycle and in pathological conditions.
- Brain plasticity and effects of sport on the athlete's brain.

Research methodologies used in the laboratory:

- Behavioral (response time and accuracy).
- Brain electrophysiology: Electroencephalogram (EEG), Event-Related potentials (ERP), brain rhythms and localization of brain sources.
- Neuroimaging: anatomical and functional Magnetic Resonance Imaging (MRI, fMRI).
- Combination between EEG/ERP and MRI/fMRI methodologies (spatiotemporal mapping of brain processes).



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10. Public Health – Epidemiology and Biotechnologies

Supervisor: prof. V. Romano Spica

Public health actions integrating physical activity into prevention: perspectives for health systems, also considering the new health challenges induced by emerging pathogens or pandemics, including Covid-19. Physical inactivity as a priority risk factor in Global Health and One Health perspectives. Physical activity and health promotion: the role of the National Health Service. Environmental microbiology and human microbiota in sport. Legionellosis. Infectious risks, vaccinations and sports activities. Safety and quality issues related to sports facilities: gyms, swimming pools, spas, and big events in light of emerging or new risks, such as SARS-CoV-2. Recreational water hygiene: guidelines and innovation for surveillance, treatments, disinfection, guidelines and consensus documents for sanitary management of swimming sports facilities. Health policies in sports and physical activities.

Methodologies: epidemiology and meta-analysis; traditional microbiology: bacterial cultures, serotyping; molecular microbiology: genotyping (Real Time PCR, ARDRA, MLST); mfDNA analysis by massive parallel sequencing and bioinformatics.

11. Sport Economics and Management

Supervisor: prof. Francesca Vicentini

The research activity of the Sports Management Laboratory addresses the following streams of research: Business models in the sports sector; Corporate Social Responsibility (CSR) and value creation in the sports sector; Management and organization of the sporting event; governance of non-profit sports companies; talent management, sports marketing, sports innovation management.

Methods: qualitative and quantitative analysis.

12. Adapted physical activity and Non-communicable diseases

Contact person: Prof. Attilio Parisi

The activities of the Exercise and Sport Sciences Laboratory involve the study of new physical activity protocols adapted to special populations. Current lines of research are aimed particularly at improving the quality of life of people affected by cancer, chronic kidney disease, multiple sclerosis, and osteoporosis. In order to evaluate the feasibility and the effectiveness of these protocols on fitness parameters and quality of life, patients are evaluated through specific functional tests and questionnaires.

Methodologies used: upper limb dynamometry, body composition analysis, Cardiopulmonary exercise testing, basal metabolic rate, non-invasive static and dynamic analysis of the spine and pelvis (Rasterstereography), Electrocardiogram (basal and under stress), tools to monitor and evaluate the training, functional test performed in the field and in the laboratory.

13. Laboratory of Sports and Applied Medical Technical Sciences

Supervisor: prof. Antonio Tessitore

Cultural Mission

The laboratory deals with the main issues related to sports and physical activity in subjects of all age groups, including those with different diseases and disabilities.



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Main research lines

Research in the field of monitoring and recovery strategies for training and competition, with particular reference to sports games, combat sports and rapid environmental adaptation; Performance monitoring in difficult environmental conditions; Performance analysis and match analysis; Technology and innovation in sports and in the service of sports coaching; Management and data analysis of training and competition.

Research in the field of medical techniques applied to environmental prevention, forensic and occupational medicine. Molecular microbiology studies through next-generation sequencing technologies. Epidemiology studies on injuries and diseases, with special reference to physical activity and sports.

The following documents must be provided in order to be considered for the admission and selection in the PhD program (Requirements)

1. Information about Graduate Studies (including title of the Graduate degree, main fields of study; grades and credits for each teaching course followed during the Graduate University Program; title of the thesis; final mark of the Graduate Studies Degree - if any- etc.) Applicants who earned/are earning their university degree abroad must fill in **Annex B** to provide this information

2. Curriculum Vitae (EU format);

3. Two letters of reference that are written by university scholars or non-university experts in the field. The authors of the reference letters cannot be members of the Faculty of the PhD program the candidate is applying to. The letters of reference (written in English or Italian) must be signed and e-mailed to the following address: ufficio.dottorati@uniroma4.it by and no later than the call deadline. The Annex "Instructions for preparing and sending the letters of reference" provides further instructions. The applicant indicates the names of the authors of the reference letters in **Annex C**.

4. A new, personally thought out, research project on a topic selected from and coherent with one of the research themes reported above, written in English (or Italian) following the Research Project Instruction or, alternatively, on a *research project on one of the following four supplementary scholarship (PNRR – DM 118, 2/3/2023)*:

- 1 *"Innovation and sustainability in water management: focus on buildings, sport facilities and swimming pools, physical activity, rehabilitation and wellness" - (1 PNRR scholarship – DM 118);*
- 2 *"Development and implementation of non-pharmacological treatments based on innovative interdisciplinary cognitive-motor interventions to address mental disorders in adults and the elderly." - (1 PNRR scholarship – DM 118);*
- 3 *"Physical exercise for health improvement in people with multiple sclerosis: implementation of an innovative protocol in telerehabilitation"- (1 PNRR scholarship – DM 118);*
- 4 *"Impact of physical exercise on the onset and progression of neurodegenerative diseases: role of alternative splicing in amyotrophic lateral sclerosis" - (1 PNRR scholarship – DM 118)*

Candidate **must indicate** on the appropriate attachment (**Research Project Form**) the chosen project. **It is strictly forbidden** to indicate candidate Name/Family name on the research project.



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This is possible only on the “Research Project Form” which must be downloaded from the application web pages, completed in every section and uploaded afterward.

The length of Research Project is between 12.000 and 34.000 characters including spaces and should clearly include: 1. Research topic; 2. State of art on the topic; 3. Research goal and hypothesis; 4. Methods and rationale for selecting these methods; 5. Indication of the novel aspects and expected results of the research project; 6. References

Additional non-mandatory qualifications

1. Additional university credentials, such as master university degrees, post-graduate or advanced, teaching courses, other PhD program degrees, research fellowships, positions, or appointments held within university or non-university research institutions (Annex C);
2. Copy of any scientific publication or book chapter, already published or in press. In this latter case, applicants must provide a statement by the Journal or book Editor to confirm the in-press status of the publication; (please upload publications and statements in pdf format)

Evaluation of requirements and Research Project

Each candidate will be evaluated with a system of a maximum score of 25 points. This system is divided in the following evaluation items:

- The evaluation of the Graduate Degree’ final grade (average of the examinations’ grades in the case of undergraduates) up to 4 points; curriculum vitae, up to 3 points;
- The evaluation of the research project for a maximum of 15 points, based on: the candidate’s knowledge of the state of art of research (6.5 points); clarity of experimental hypotheses and rationale for the selection of methodology (6.5 points); originality and significance of hypotheses and goals (2 points).
- The evaluation of any non-mandatory additional qualifications for a maximum of 3 points: up to 2 points for publications; up to 1 point for additional university credentials.

A minimum total score of 17/25 is necessary for applicants to be selected for the following phase of the evaluation process (i.e., colloquia).

Date, time, location of colloquia

The colloquia will start in **September the 25th 2023, at 10 a.m.**, at the University of Rome, “Foro Italico”, largo Lauro de Bosis n.15. If the number of candidates does not allow to complete the colloquia in a single day, the schedule of colloquia will continue in consecutive days. The schedule of colloquia will be published at <http://www.uniroma4.it/> selecting “Accesso rapido >Dottorati”.

The final outcomes of the entire evaluation process in all its phases will be web published at the same address.

This communication will be the only one, and the candidates may not expect any notice or communication via regular mail prior to or after this web publication of the outcomes.

Foreign candidates who are interested to eventually participate, should they be selected, to the colloquia via SKYPE must file a request by **September the 5th 2023, 10:00 a.m. local time**, to ufficio.dottorati@uniroma4.it In this request, they must also indicate their Skype address. The dates and times of the SKYPE interview, with further indications about the place where the Committee will meet for the interview, will be available at the same web address. The candidates



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	<p>who will not attend the SKYPE interview at the date and time that has been arranged will no longer have the opportunity to re-schedule such an interview.</p>
Description of the colloquia	<p>The colloquia with the candidates will focus on the oral presentation and discussion (in English or in Italian) of the research project that has been prepared by the candidates and be evaluated by the Committee (maximum score 14 points for presentation and discussion). The colloquia will also focus on the candidates' past research experiences (maximum score 2 points), as well as their motivations and goals for selecting this PhD program (maximum score 4 points). Finally, the colloquia will also serve to evaluate the candidates' proficiency in English language (maximum score 5 points).</p> <p>As for the research project, during the colloquia, the committee will specifically evaluate the candidates' knowledge and capacity to discuss the relevant research background (5 points); his or her capacity to discuss hypotheses, rationale of the study, expected findings and implications (5 points); capacity to justify the research methodology being suggested, and knowledge of the specific research techniques being called upon (4 points).</p> <p>The colloquia are open to public.</p>
<p>Scoring of the Colloquia At the colloquia, each candidate will be assigned a maximum score of 25 points.</p>	
Final Rankings of the candidates	<p>PhD candidates will only be included in the final ranking in case the evaluation process of their admission requirements and research project, as well as of their colloquia will yield a minimum score of 30/50.</p> <p>The evaluation committee will prepare and finalize the ranking grouping those candidates who have presented their research projects on one of the twelve research areas described above and will assign 8 positions with financial scholarship and 2 positions without scholarship.</p>

Positions	with scholarship	12 (8 + 4)
	without scholarship	2
	Total	14