

## Call for PhD Candidate (Early Stage Researcher) Vacancy

### Disc4All

Training network to advance integrated computational simulations in translational medicine, applied to intervertebral disc degeneration

Funding: European Commission H2020-MSCA-ITN-ETN-2020 GA: 955735

Contact: [disc4all@upf.edu](mailto:disc4all@upf.edu)

Web: <https://www.upf.edu/web/disc4all>

### General Information:



The European community requires early stage researchers (ESR) who can work across the boundaries of traditional disciplines, integrating experimental and in silico approaches to understand and manage highly prevalent multifactorial disorders, such as musculoskeletal disorders. The Disc4All training network utilises intervertebral disc degeneration (LDD) that leads to low back pain (LBP) as a relevant application for the integration of data and computational simulations in translational medicine, to enable rational interpretations of the complex interactions that can lead to symptoms.

LBP is the largest cause of morbidity worldwide, yet there remains controversy as to the specific cause leading to poor treatment options and prognosis. LDD is reported to account for 50% of LBP in young adults, but the interplay of factors such as genetics, environmental, cellular responses, social and psychological is poorly understood. Unfortunately, the integration of such data into a holistic and rational map of degenerative processes and risk factors has not been achieved, requiring the creation of professional cross-competencies, which current training programmes in biomedicine, biomedical engineering and translational medicine fail to address, individually.

Disc4All aims to tackle this issue through collaborative expertise of clinicians; computational physicists and biologists; geneticists; computer scientists; cell and molecular biologists; microbiologists; bioinformaticians; and industrial partners. It provides interdisciplinary training in data curation and integration; experimental and theoretical/computational modelling; computer algorithm development; tool generation; and model and simulation platforms to transparently integrate primary data for enhanced clinical interpretations through models and simulations. Complementary training is offered in dissemination; project management; responsible research and innovation; ethics; regulation; policy; business strategy; public and patient engagement. Disc4All will train a new generation of internationally mobile professionals with unique skill sets for the development of thriving careers in translational research applied to multifactorial disorders.

### Hiring Institution

Hiring Disc4All Member: Universitat Pompeu Fabra (UPF)

Web: [www.upf.edu](http://www.upf.edu)

**Address:**

Universitat Pompeu Fabra  
Plaça de la Mercè, 12  
08002 Barcelona, Spain

UPF was established in 1990 as a public university with a strong dedication to excellence in research and teaching. UPF is in the top 150 universities worldwide and top 50 in Europe, in Engineering and Technology (Times Higher Education rankings 2020). It is one of the leading Spanish universities and the 10<sup>th</sup> best young university worldwide according to Time Higher Education Under 50 (2020). UPF coordinates Disc4All and takes part in the project through its ICT Department (DTIC), which has more than 60% international researchers from 48 different countries. DTIC is strategically located within the vibrant 22@ technological district of Barcelona. It has been recognized as “María de Maeztu” unit of excellence by the Spanish government for the quality and relevance of its pioneering scientific research (2015-2020). Within DTIC, Disc4All is led from the BCN-MedTech research unit (<https://www.upf.edu/web/bcn-medtech/>). BCN MedTech has a team of 60 full time researchers, with major focus on computer models and simulations in biomedical engineering for the exploration of disease mechanisms, advanced computer-aided diagnosis, treatment planning and prognosis, among others.

Type of contract: temporary (36 months)

Job status at UPF: full-time

Hours per week: 37,5

Incorporation date: May 2021, at the latest

EU Research Framework: H2020 MSCA-ITN-ETN

Marie Curie Grant Agreement Number: 955735

**Open Position**

Topic: Bottom-up simulations of spatio-temporal degenerative events in the IVD & biological LDD stratification

Description: The successful candidate will work on the systematization of multiscale modelling of the intervertebral disc regulation for improved LDD stratification. Existing regulatory network and multiphysics models, at the molecular/cell and tissue/organ scales will be locally integrated in relevant regions of interest of the IVD. Such integration will be coupled with different disc model morphologies and molecular signature inputs, from the Twins UK and Northern Finland Birth cohorts. A smart atlas of simulated data will be generated, to eventually enable efficient calculations through metamodeling. Metamodeling will further allow the mining of simulated and real word data altogether, to establish different fingerprints of LDD and the spatio-temporal evolution thereof, characterised by specific hierarchies of risk factors and exploitable clinically.

Supervision: Jérôme Noailly (UPF)

Co-supervision: Gemma Piella (UPF), Jaro Karppinen (OULU), Mark van Gils (Tampere University), Marc-Antonio Bisotti (InSilicoTrials)

Main working place: UPF-DTIC, Campus Poble Nou, Barcelona, Spain (<https://www.upf.edu/web/etic>)

Working lab: BCN-MedTech (<https://www.upf.edu/web/bcn-medtech/>)

### **Benefits**

The MSCA programme offers a competitive salary and attractive working conditions, in accordance with the MSCA regulations for early stage researchers.

You will be enrolled in the PhD programme of Information and Communication Technologies of the UNIVERSITAT POMPEU FABRA – UPF (<https://www.upf.edu/web/etic/doctorat>), and have the opportunity to learn from a consortium of 19 institutions (11 Beneficiaries, 8 Partner organizations - <https://www.upf.edu/web/disc4all/beneficiaries>). In addition to the individual scientific projects, all ESRs will benefit from further continuing education, which includes secondments (to University of Oulu, to University of Tampere and to InSilicoTrials, for this specific project), a variety of training courses for specific and transferable skills and active participation and international conferences.

Successful candidates will be offered a 36 months full-time employment contract, with a monthly average gross salary of 3119 €, plus a mobility allowance of 600€ per month (unconditional) and a family allowance of 500€ per month (if applicable).

All the amounts mentioned above are expressed before statutory deductions in charge of the Institution and the candidate: National Insurance and Income Tax.

### **Eligibility criteria**

a) To apply for these MSCA Training positions, applicants must fulfil the following criteria:

- Mobility: to be eligible for a position, you shall not have resided in the same country as the host institution for more than 12 months over the three years previous to the start date of the position, excluding holidays and (refugee status) asylum application.
- Early Stage Researcher (ESR): An ESR shall at the time of recruitment by the host organisation, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree.

Candidates must prove that they fulfil the aforementioned criteria through relevant documentation (certificates, official statements, residency card, ...).

b) Specific requirements for the proposed project:

- Educational Level: Biomedical Engineering, Physics, Mathematics, Computer Science or other related fields (master degree or equivalent)

- Required languages: English
- Skills/Qualifications: Experience with data infrastructure design and cloud services
- Eligibility to enrol in the PhD programme at the Universitat Pompeu Fabra (<https://www.upf.edu/web/etic/doctorat>)

### **Selection Criteria**

The selection committee uses a number of indicators to evaluate the applicant's preparedness, motivation and potential.

#### *1<sup>st</sup> phase, remote pre-selection:*

The Scientific, Technological & Academic excellence will be considered at first, based on:

- Quality of the CV, in general
- Any demonstrated research experience, particularly if supported by evidences such as scientific publications, patents, participation in scientific congresses, ...
- Undergraduate performance: overall, with a special focus on relevant field-specific courses
- Any demonstrated previous recognitions (grants, awards, ...)
- Reference letters provided by professors and senior scientists: Three reference letters are expected. At least two letters must be issued by scholars. The third letter can be provided either by a scholar or by a relevant professional of the industrial sector. Referees are asked to address analytical capabilities, technical proficiency, ability to work independently and motivation/commitment.
- Statement of purpose: past research experience, motivation for applying to this particular PhD project, academic fit, contribution of the project to the candidate's future careers plans, ...
- Additional relevant skills (field-specific): demonstrated, e.g. through previous projects, and or through previous participation in scientific contests, trainings, ...

#### *2<sup>nd</sup> phase, interview(s):*

Should the candidate be preselected at phase 1, a second phase will consist in at least one interview through which the motivation, the proactive behaviour, the capacity to work collaboratively, the organizational skills, the communication skills and the capacity to engage in a scientific discussion and manage problems, will be assessed, among other aspects.

The final decision will be the result of a consensus of a recruitment committee that will take into account the results of both recruitment phases 1 and 2. The candidate will be informed of the section results by email.

### **Application Process:**

All the documents that prove the eligibility of the candidate and should be provided. As for the selection process candidates are expected to provide at least the following documents:

- A brief introduction letter (no more than one A4 page) that summarizes the documents and the nature of the information provided for the selection
- A full CV
- The three requested reference letters
- The letter of purpose (no more than two A4 pages)

All documents must be sent by email to the Principal Investigator of the proposed project (Jérôme Noailly – [jerome.noailly@upf.edu](mailto:jerome.noailly@upf.edu)) and to the Management of the Disc4All project ([disc4all@upf.edu](mailto:disc4all@upf.edu)) **by March 20<sup>th</sup>, 2021**