Title: Development of an in silico model of osteoporosis drug treatments

Tutor: Prof Marco Viceconti - https://www.unibo.it/sitoweb/marco.viceconti/en

Funding source: project In Silico World (Grant N. 101016503)

Research Project

As part of the In Silico World project, the team of Prof Marco Viceconti at the University of Bologna plans to develop an In Silico Trials technology to test the efficacy of osteoporosis drugs. The group already has developed a fully validated subject-specific CT-based finite element modelling procedure to accurately predict bone strength, and more recently a virtual cohort of 1000 virtual patients, enough to run the in silico equivalent of a phase III clinical trial. The candidate is expected to develop a fully validated disease progression model, that can be modulated by the simulation of the treatment with different drugs. The idea is to start from results of drug efficacy obtained experimental on animal models (e.g. ovariectomised mice), and "scale" appropriately such results to humans, so to predict how our virtual cohort would see its risk of bone fracture reduced if treated with that drug. The candidate is expected to validate the intervention model by replicating in silico phase III clinical trials of well-known drugs, as reported in the literature.

The research contract (Assegno di Ricerca), has an annual salary before taxes of € 26,174.00. While the initial contract is for 12 months, if successful the post holder contract could be extended until the end of the project, in September 2023.

The ideal candidate for this position holds a degree in engineering, good spoken and written English, documented experience in computational biomechanics, and one or more of the following skills:

- Familiarity with Finite Element Analysis

- Previous experience in Bone biomechanics research

- Some programming skills

- Familiarity with Medical imaging methods

- Some basic knowledge of bone biology, osteoporosis, and related farmacology

While a PhD is not formally required, we expect most candidates to have one, or being very close to graduation.

Place of work: all activities will take place at the institutional sites of the department DIN, or at the istituto ortopedico Rizzoli (Bologna).

Sede di svolgimento delle attività: le attività si svolgeranno presso le sedi istituzionali del DIN e presso l'istituto ortopedico Rizzoli (Bologna).

Short description

The ideal candidate for this position holds a degree in biomedical engineering, medical physics or related disciplines, documented experience in modelling of the human biomechanics, and good spoken and written English. Under the guidance of Prof Marco Viceconti the post holder will develop a complete In Silico Trial technology to test the efficacy of new osteoporosis drugs.

Il candidato ideale per questa posizione ha una laurea magistrale in ingegneria biomedica, fisica medica, o discipline collegate, documentata esperienza nella modellazione della biomeccanica umana, ed un buon inglese parlato e scritto. Sotto la guida del Prof Marco Viceconti l'assegnista di ricerca svilupperà una soluzione complete di In Silico Trials per valutare l'efficacia di nuovi farmaci per l'osteoporosi.

Composizione della Commissione Giudicatrice:

- Prof Marco Viceconti
- Dott Cristina Curreli
- Dott Antonino La Mattina
- Prof Luca Cristofolini (Supplente)

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