



SPORTS SURGERY CLINIC
*Specialists in Joint Replacement, Spinal Surgery,
Orthopaedics and Sport Injuries*

Full Professor and Chair of Orthopaedics and Surgical Biomechanics

Dublin City University (DCU) and Sports Surgery Clinic (SSC) seek to appoint a clinician of international reputation to the newly established post of Full Professor and Chair of Orthopaedics and Surgical Biomechanics. This will be a joint appointment between DCU and SSC.

Within DCU the successful applicant will be based in the School of Health and Human Performance, and work in close collaboration with both the School of Mechanical and Manufacturing Engineering and INSIGHT, SFI's Research Centre for Data Analytics. The successful applicant will have a significant track record in research, a proven ability to attract funding and will demonstrate passion and excellence in teaching and learning, in addition to providing a clinical service as a Consultant Orthopaedic Surgeon at SSC. Located in Santry, Dublin SSC is Ireland's No. 1 Private Orthopaedic Hospital specialising in Joint Replacement and Sports Medicine.

The post offers an exciting opportunity to work with experts across multiple domains, to further cultivate research and academic leadership, and to develop a unique centre for interdisciplinary research in orthopaedics and surgical biomechanics.

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Application Procedure:

Application forms are available from the DCU Current Vacancies website at: dcu.ie/hr/vacancies/current.shtml.

Applications must be submitted by Email to: hr.applications@dcu.ie

Please clearly state the role applied for in the application and email subject line: Job Ref #NR137 Full Professor and Chair of Orthopaedics and Surgical Biomechanics

Dublin City University is an Equal Opportunities Employer. In line with the Employment Equality Acts 1998 – 2015, the University is committed to equality of treatment for all those who engage with its recruitment, selection and appointment processes. The University's Athena SWAN Bronze Award signifies the University's commitment to promoting gender equality and addressing any gender pay gaps. Information on a range of university policies aimed at creating a supportive and flexible work environment are available in the DCU Policy Starter Packs.

Full Professor and Chair of Orthopaedics and Surgical Biomechanics

**This position is a joint appointment between Dublin City University and the Sports Surgery Clinic
3 Year Fixed Term Contract**

Introduction

The Sports Surgery Clinic (SSC) is the leading private orthopaedic hospital in Ireland with both a national and international reputation for orthopaedic surgery and sports medicine.

SSC offers a rapid access facility for screening, diagnosis, rehabilitation and surgical treatment.

In addition, it is home to Europe's largest Sports Medicine department that not only focuses on the outpatient diagnosis and rehabilitation of patients from across Europe and the world, but also using SSC Lab's unique approach to tailored rehabilitation, driven by 3D biomechanics research performed at Sports Medicine and also on outcomes improving athletic performance and reducing injury risk, through advanced biomechanical analysis.

The practice of surgery and medicine at SSC is underpinned by evidence-based methods and there is a strong culture of research throughout the institution. SSC Sports Medicine is also home to SSC Lab led by the Director of Sports Medicine. Sports Medicine has been the current primary focus of research activity at SSC, and support's a varied biomechanics research team investigating clinical biomechanical outcomes of ACL Reconstruction, Joint replacement, Knee osteoarthritis, athletic groin pain, shoulder stability, Achilles and ankle pain and low back pain. SSC Lab employs a team of Biomechanists and industrial placement students who provide raw data for the Sports Medicine research team and a wider team of clinical PhD students studying SSC specific goals. These students collaborate with a global portfolio of expertise in clinical management and biomechanics highlighting the real commitment that SSC places on promoting future breakthroughs in Orthopaedic Surgery and Sports Medicine.

Facilities at SSC include seven ultra clean-air operating theatres dedicated to orthopaedic and spinal surgical procedures, an onsite diagnostic imaging department including two 3.0 Tesla MRI Scanners, 27 consultant rooms and 83 Inpatient beds and 18 day-case beds, and SSC Sports Medicine, a standalone 10,000 sq. ft. facility seeing 40,000 outpatients for assessment and rehabilitation.

Since it was established in 2007, SSC has developed into the busiest private orthopaedic hospital in Ireland. The high quality and efficient clinical services that have been developed cater for increasingly larger numbers of patient's year on year. In 2019, 1522 anterior cruciate ligament reconstructions were performed at SSC, making it one of the highest volume centres for knee surgery in Europe. With these numbers likely to increase further in the future, there is tremendous potential to establish SSC as a leading institution in orthopaedic research internationally. This provides an ideal opportunity for collaboration with DCU, a neighbouring University with a burgeoning reputation for research and innovation internationally, particularly in the fields of sports science and bioengineering.

Dublin City University (www.dcu.ie) is a research-intensive, globally engaged, dynamic institution that is distinguished by both the quality and impact of its graduates and its focus on the translation of knowledge into societal and economic benefit. DCU prepares its students well for success in life, and in the workplace, by providing a high- quality, broad education appropriate to the challenges and opportunities of the 21st century. As Ireland's University of Enterprise, it is characterised by a focus on innovation and entrepreneurship and a track record of effective engagement with the enterprise sector. Excellence in its education and research activities has led to its consistent position in the rankings of the world's top young universities (e.g. THE 100 Under 50).

Aside from the geographic proximity of DCU and SSC (located 3 kilometres apart on Dublin's Northside), there are many similarities between the respective institutions in terms of culture and ambition. DCU, like SSC, is a young institution, which has grown rapidly in scale and performance since being established as a university in 1989. But, the similarities do not stop there; DCU has not adopted the traditional mould to third level education much akin to the unconventional approach SSC has followed in the delivery of musculoskeletal care in Ireland. Sport is also a common thread, which plays a huge role in the university and as the name would suggest is central to the services provided at SSC. However, it is DCU's commitment to research particularly in the fields of sports science, human performance, and bioengineering that makes the possibility of a collaboration with SSC very exciting. Our proposal also builds upon the already existing relationship between SSC, SSC Sports Medicine and colleagues within both the School of Health and Human Performance (www.dcu.ie/shhp) and Insight SFI Research Centre for Data Analytics (www.insight-centre.org) within DCU. Together we have already graduated two full-time PhDs and two more are completing their studies part-time, gaining from the rich experience of both a clinical work environment in the SSC and a dedicated research experience in DCU.

The appointment of a Full Professor and Chair of Orthopaedics and Surgical Biomechanics, offers the opportunity to harness the strengths of each respective institute to effect real change in the practice of Surgical Biomechanics, Orthopaedics and Sports Medicine.

It is proposed that the applicant for this role will have a distinguished reputation in research and will be expected to develop novel research strategies between DCU and SSC, which are related to both: the biomechanical analysis of anatomical injury and surgical techniques, and the outcome following surgical interventions. Therefore, the two key elements of this role are as follows:

1. The development of a cadaveric biomechanical laboratory in conjunction with DCU School of Mechanical and Manufacturing Engineering (www.dcu.ie/mechanicalengineering).
2. Establishment of a robust database of clinical practice within SSC to capitalise on the volume of pre-operative, intra-operative and post-operative data available. It is anticipated that the collaboration with Insight SFI Research Centre for Data Analytics will facilitate whole clinic data collection, advanced data mining and subsequent interpretation to evaluate orthopaedic outcomes.

It is expected that this post will work closely and in parallel with the Sports medicine and clinical biomechanics work run by the Director of Sports Medicine and SSC Sports Medicine sharing similar goals.

It is proposed that this jointly-appointed post will be based within the School of Health and Human Performance, Faculty of Science and Health and work closely with the School of Mechanical and Manufacturing Engineering and Insight SFI Research Centre for Data Analytics.

Duties and responsibilities

Please refer to the job description for the responsibilities associated with this post.

The successful candidate will be expected to meet exacting criteria in the following areas:

Research:

The candidate should have an excellent and world-class record in research, an ability to attract substantial funding as Principal Investigator or named collaborator and be productive in research output. S/he will also demonstrate the ability to work collaboratively with colleagues in orthopaedic surgery and sports medicine and other specialities. The core skills required will be the ability to apply sound scientific principles to the study of musculoskeletal biomechanics and related topics, to be able to communicate the outcome and value of research, and to encourage others, especially junior colleagues, to participate in research.

Biomechanical Research:

The study of biomechanics is an integral component of orthopaedic research. One of the key roles of orthopaedic surgery is to restore joint kinematics with a view to maintain normal function. To achieve this, one needs to understand not only the biomechanics of the joint but also the effect on the kinematics of the whole skeleton. As such, the proposed collaboration would involve the development of a Cadaveric Biomechanical Testing Laboratory

Cadaveric Biomechanical Testing Laboratory:

In order to test the biomechanics of a joint, one needs to be able to simulate normal movement under varying loads. Robotic testing using a six-degree-of-freedom robotic arm has become the gold-standard for evaluation of joint reconstruction techniques. The robotic arm that is equipped with a universal force torque sensor which allows accurate testing of cadaveric human joints to gain insight into their kinematics. In a typical setup, one end of the cadaveric human joint is securely fixed to a pedestal, while the other end is held in the end effector of the robotic arm allowing the robot to move the joint it is by applying load.

The robot can submit the joint to specific forces while measuring displacements and rotations in all three dimensions. This provides data on how the joint behaves in terms of range of motion, stiffness and response to standardized clinical tests usually performed by surgeons. The main advantages of using a robotic system compared to evaluating joint kinematics by hand include accuracy and repeatability.

Cadaveric cutting Studies:

Key to the understanding of the kinematic of a joint, is a thorough knowledge of the role of each anatomical structure. Cutting studies can be performed to identify the effects of joint structures, such as tendons and ligaments, on joint kinematics. To accomplish this, an evaluation of the intact joint kinematic is performed as a reference. Next, sequential sectioning the structures being examined is carried out, with re-evaluation of joint kinematics

after each cut. This produces important information about which structures are primary and secondary stabilizers for given joint motion.

Cadaveric Reconstruction Studies:

The aim of reconstruction studies is to evaluate the performance of surgical procedures on restoring joint kinematics following an injury. To accomplish this, an evaluation of the intact joint kinematics is carried out, then a joint injury is simulated, and finally a reconstruction is performed to evaluate joint kinematics after each state. Successful reconstructions are those that present minimal kinematic differences compared to the intact state, because this shows that the joint's motion is close to the way it was prior to injury.

- Work closely with the current affiliated faculty at DCU to develop and staff a cadaveric biomechanical testing laboratory including internal strain, joint kinematics and kinetics and tissue engineering.
- Contribute to the development of parallel lines of research into biotechnologies to enhance soft tissue repair through the design of instruments and biodevices for implantation.
- Lead the investigation and development of point of care interventional strategies to enhance soft tissue reconstruction techniques. This will occur through collaboration with relevant Principal Investigators at DCU including faculty members engaged in tissue engineering and medical device research.

(A.2) Clinical Biomechanics (Field):

SSC Sports Medicine, runs SSC Lab within its facility, including the existing two (2) field change of direction VICON labs, 2 isokinetic dynamometers and the Shoulder VICON lab. It is envisaged in 2021, a Joint Lab will add a third isokinetic dynamometer and walking 3D VICON lab, and that RunLab will take the capacity to five (5) labs with an instrumented treadmill along with 3D motion capture in addition to the cadaveric laboratory proposal.

- SSC Sports Medicine has several areas of clinical biomechanics research, it is envisaged that surgical biomechanics projects would integrate, align and build parallel activity streams alongside the work already being done under the Director of Medicine and the Head of Performance's management and vision.
- There is potential for shared appointment of laboratory staff to cross the bridge between surgical and clinical biomechanics, to increase collaborative ventures globally and enhance output and outcome.

(A.3) Clinical Outcome Based Research in Surgery:

Collecting pre, peri, intra and post-operative outcome data is not only essential to monitor the effectiveness of a particular treatment, but also to understand the natural history of orthopaedic conditions. Indeed, it is likely that this data will become obligatory in the future to demonstrate clinical effectiveness. At SSC, a key focus for the future is to conduct prospective studies to evaluate specific patient groups. This evaluation involves the assessment of objective, subjective and functional outcomes over a specific time period, but also to harness the potential of machine learning on large data sets.

It is the goal that a single point of record for every patient at SSC encapsulates both wellness, health and lifestyle factors, commonly used pre and post-surgical patient reported outcome measures (PROMS) and intra and post-operative data.

It is envisaged that this position can lead the collaboration with INSIGHT delivering and leveraging data mining techniques to optimise both streamlining, outcomes, presentation to patients and commercial success, using the high capacity of the clinic.

Collaborate and coordinate with SSC Sports Medicine research programs and SSC Lab research activity and global collaborations. An example will be the commissioning of Joint Lab, by SSC Sports Medicine, which is driven to collect pre, peri and post-operative novel data on patients undergoing total knee arthroplasty. SSC Sports Medicine have existing Marie Curie/Horizon grant application in place for biomechanical support to this project under the research proposal "BioHOURS: The Biomechanical influence on Health Outcome following joint Replacement Surgery".

This is only possible through a commitment from the administrative, medical and surgical departments alike and a strong culture of research within the institution.

Qualifications & Experience:

Mandatory/Required:

- The candidate should have an excellent and world-class record in research, an ability to attract substantial funding as Principal Investigator or named collaborator and be productive in research output.
- Clinical training in the generality of Orthopaedic Surgery (Higher Surgical Training in Orthopaedic Surgery or equivalent international training).
- Completion of an international clinical and academic structured Orthopaedic Surgery Fellowship Programme in the sub-speciality of Orthopaedic Sports Medicine.
- The possession of the clinical qualification of FRCS (Trauma & Orthopaedics) or a qualification equivalent.
- A higher degree in research (MD or PhD).
- Experience in teaching and administration of Orthopaedic Surgery and Sports Medicine.
- A track record of publishing high quality journal papers in this field.

Desirable:

- Extensive biomedical and bioengineering research experience and demonstration of long-standing commitment to an academic career.
- Translational research experience in orthopaedic sports medicine, cartilage repair and the biological augmentation of soft tissue surgery.
- Registration as a specialist in the Specialist Division of the Register of Medical Practitioners maintained by the Medical Council in Ireland in the speciality of Trauma and Orthopaedic Surgery.

Closing Date: 12 noon, Friday 11 June 2021

Informal Enquiries to:

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