

## Career Development Plan

Name of fellow: **Christakis Constantinides**

Department: **Rdm Cardiovascular Medicine**

Name of Supervisor: **Prof Jurgen Schneider**

Date: **1/7/15**

### **BRIEF OVERVIEW OF RESEARCH PROJECT AND MAJOR ACCOMPLISHMENTS EXPECTED:**

Cardiosphere-derived stem cell (CDC) therapy for myocardial infarction (MI) has been shown to elicit moderate beneficial effects. Research currently focuses on improving CDC administration, retention and efficacy. This proposal aims to develop Magnetic Resonance Imaging (MRI) and engineering **tools** to facilitate this research. Specifically, microinjection of <sup>19</sup>F labelled CDCs will allow for MRI tracking and quantification in-vivo. Non-invasive global and regional cardiac function measurements will assess efficacy of stem cell (SC) therapy. Parallel to these studies will be an independent design, use and evaluation of a fibre-enriched scaffold. The anticipated impact will be multifaceted, including the study of cardiac function in disease, and the potential applicability of generated results with cutting edge SC regenerative technologies in heart failure and prominent cardiomyopathies. Research efforts will be stimulated in manufacturing processes for scaffolds, cardiac functional assessment post-injection of SCs, and validation of their homing, engraftment and viability using cellular tracking methods. Through a personalized career development plan, the Fellowship will allow training of the researcher in advanced cellular characterization, labelling, and bio-imaging techniques, synergistically with trans-European mobility, reinforcing his scientific, managerial and leadership qualities. Overall, the short-term objective is the advancement of the researcher's career in science and the broadening of his scientific horizons. The long-term objective is the Fellow's establishment as an independent investigator.

### **LONG-TERM CAREER OBJECTIVES (over 5 years):**

1. Goals:

Long-Term

- a. To attain an academic position at a University institution and secure a permanent position
- b. Secure research funds
- c. Attain a productivity record that will include prominent publications in high impact journals and conferences
- d. Establish an independent teaching curriculum
- e. Establish an independent research path as an investigator
- f. Advise undergraduate and graduate students, leading to completion of dissertations or theses
- g. Establish a collaborative research and training network
- h. Establish an independent laboratory
- i. Engage in administrative, research, and teaching activities that will promote the host Department's mission
- j. Promote activities that will lead to patents

Short-Term

- a. Enhance and enrich scientific knowledge and skills – advance re-skilling whenever possible
- b. Prominent publications in high impact journals
- c. Secure additional research funds
- d. Secure a patent(s)
- e. Advance and improve writing and communication skills (including public speaking)
- f. Understand and enhance qualities of science policy to allow introduction of new curricula at a University level and steer thematic areas to benefit multidisciplinary research and teaching
- g. Enhance communication and networking skills to capitalize on research grants and career opportunities
- h. Enhance skills for interviewing undergraduate and graduate student admissions
- i. Enhance skills for recruitment of new faculty
- j. Improve project management skills
- k. Develop qualities for leadership and management practice in the academic setting
- l. Acquire skills for project management for European grants

m. Streamline a personal development plan that will entail educational, managerial, scientific, and cross-sectoral skilling and re-skilling

2. What further research activity or other training is needed to attain these goals?

A. Attend to workshops/seminars or courses targeted towards career advancement and personal development. Specifically, the following workshops/seminars are planned to be attended during the first year:

OLI (Year I)

- a. ONLINE
  - a1. Undergraduate admissions interviewing: online course (tutored)
  - a2. Managing people: key processes
- b. OTHER
  - b1. Undergraduate admissions interviewing: practice session
  - b2. Designing courses
  - b3. Academic leadership development programme
  - b4. Essentials of Project Management
  - b5. Principle Investigators

Division of Med. Sciences (Year I)

- a. Leadership, managing people and building teams (18 Sept, 2015 from 9.15am-4.30pm)
- b. Teaching, presentation and facilitation skills (2 Oct 2015 from 9.15am-4.30pm)

B. Identify mentors within the Oxford University setting (in the areas of science and project management/careers)

C. Network within the University setting, and Europe (attendance to conferences, submission of manuscripts etc.)

**SHORT-TERM OBJECTIVES (1-2 years):**

1. Research results

- o Anticipated publications:

These will include publications to respectable journals in the fields of imaging and physiology as they relate to developments of <sup>19</sup>F MRI and cellular tracking, identification of mechanisms of labeling, cellular scavenging, and cellular tracking, scaffold development and high-efficiency stem-cell delivery, applications of developed techniques to myocardial infarction. These journal publications will be complemented with conference presentations and dedicated workshop attendance. A preliminary plan for the formulation and submission of a book is under way.

It is expected that a steady publication record will be established at regular intervals throughout the two-year fellowship period. To the very least, the productivity record will reflect minimum European Commission standards and overall EU expectations.

- o Anticipated conference, workshop attendance, courses, and /or seminar presentations:

2. Research Skills and techniques:

- o Training in specific new areas, or technical expertise etc:

Scientific training: Training by research will lead to improved competency in experimental design (e.g. learning new techniques, instruments etc.), quantitative and qualitative analyses, critical thinking, and technology transfer. Acquired skills will target areas of cell extraction, culturing, cellular labelling, microinjections, immuno-histochemistry, and confocal microscopy.

Ethics: Valuable experience will be gained in longitudinal studies of animal models of disease, and relevant ethical issues. Furthermore, through the attendance and certification through the

Home office and parallel attendance to relevant courses, the grasp of ethics on animal use will be further enhanced.

*Technical expertise:* Competences in experimental design, quantitative, and qualitative methods, relevant research methodologies, data acquisitions, statistics, and analytical skills will be enhanced.

Through daily engagement in research activities, original, independent, and critical thinking will be developed and complemented with a critical analysis and evaluation of own experimental findings and findings from others. Dedicated and specialized scientific training is also anticipated in nano-labelling (Coimbra, Portugal) and on rapid prototyping (through a secondment) that will also aid in an interdisciplinary transfer of knowledge. Finally, training will also be dedicated to gender issues (endorsing the EU Charter for Researchers and Code of Conduct, counteracting gender barriers, promoting equal opportunity activities). Through the attendance and possible pursuit of a patent application, accumulated knowledge is also envisaged on technology transfer, thereby leading to a better appreciation of IPPR.

3. Research management:

- Emphasis will be given on improving inter-personal skills, and working in a team environment, promoting critical thinking, key-elements of an independent researcher. Through daily experiences, skills appropriate and necessary to working with others and in teams and in teambuilding will be developed.

4. Communication skills:

These will include improvement of technical writing and presentation skills, attendance to recruitment interviews, organized accelerated courses, and through planned dissemination/public engagement activities. Additionally, personal presentation skills, oral/poster presentations, skills in report writing and preparing academic papers and books will be enhanced as part of the planned research and dissemination and public outreach activities. These will contribute to promote public understanding of the field of biomedical imaging and cellular stem cell physiology.

5. Other professional training (course work, teaching activity):

It will be accomplished through self-paced learning through webinars, computer-based and equipment use training and innovation (e.g. close-to-market elements, IPR-management etc.). Mentoring of an undergraduate student in the basics of MRI or basics of cardiac physiology is also planned.

6. Anticipated networking opportunities:

The researcher will develop a co-operative network with productive working relations with the supervisor, peers and colleagues within the institution and the wider research community, as these will reflect activities within BMRU, DCVM, the Wellcome Trust, U. Oxford, collaborators in Portugal, the Netherlands, and a European corporate site on rapid prototyping.

7. Other activities (community, etc.) with professional relevance:

The Oxford experience is anticipated by the Fellow to be a turning point for his career. It will allow him to secure an academic position, catalyzing significant career development in the academic sector, maximizing contribution to the knowledge-based economy and society. Issues related with career management, including transferable skills, management of own career progression, ways to develop employability, will be pursued through the development of complementary-transferable skills (mainly through the Oxford Learning Institute (OLI) and the host Division.

Date & Signature of fellow:  
Dr. C. Constantinides  
8 July, 2015

Date & Signature of supervisor