China Scholarship Council – University Maastricht

PhD Programme Application form

Basic information

- To be filled in by the prospective UM supervisors -

1. Information on prospective UM supervisors and Promotor

1a. First Supervisor/promoter:

- Title(s), initial(s), first name, surname: Dr. S.H. van Rijt
- Research group: Department of Instructive Biomaterials Engineering, MERLN Institute for Technology-Inspired Regenerative Medicine
- Address for correspondence: Universiteitssingel 40, 6229 ER Maastricht, PO Box 616, 6200 MD Maastricht
- Telephone: +31640067508
- E-mail: s.vanrijt@maastrichtuniversity.nl

1b. Second Supervisor/copromoter:

- Title(s), initial(s), first name, surname: Dr. F.H.J. van Tienen
- Research group: Dept. Toxicogenomics
- Address for correspondence: Universiteitssingel 50, 6229ER Maastricht, PO Box 616, 6200 MD Maastricht
- Telephone: +31433882918
- E-mail: Florence.vantienen@maastrichtuniversity.nl

1c. Promotor (if applicable): **– see above**

- Title(s), initial(s), first name, surname: Prof. dr. H.J.M. Smeets
- Research group: Dept. Toxicogenomics
- Address for correspondence: Universiteitssingel 50, 6229ER Maastricht, PO Box 616, 6200 MD Maastricht
- Telephone: +31 433881995
- E-mail: bert.smeets@maastrichtuniversity.nl

2. Information on UM Faculty/ Department/ Institute/ School contact person:

When the application is granted by both the CSC and UM, the contact person is responsible for the practical arrangements (i.e. assistance in obtaining a visa, finding accommodation, etc.) of the visit

of the PhD candidate:
- Title(s), initial(s), first name, surname: Dr. S.H. van Rijt
- Research group: Department of Instructive Biomaterials Engineering, MERLN Institute for Technology-Inspired Regenerative Medicine
- Address for correspondence: Universiteitssingel 40, 6229 ER Maastricht, PO Box 616, 6200 MD Maastricht
- Telephone: +31640067508
- E-mail: s.vanrijt@maastrichtuniversity.nl

The CSC student will be embedded within MERLN institute in the nanomaterials group and at the Toxicogenomics department, which both offer an international and diverse student community; see our websites (https://merlninstitute.com/ and www.generateyourmuscle.com) for more information about our research, scientists and infrastructure. We are currently hosting several CSC students and are happy to provide the contact details of (some of) our CSC students to provide additional information.

- To be filled in by the applicant if already known –

1. Information on the applicant

- Initial(s), first name, surname:
- Male/female:
- Current work address:

- Telephone:
- E-mail: WeChat:
- Private address:

2. Details of applicant's home university
Note! A separate letter of recommendation by the supervisor or faculty dean of the home university is required.

- Name of home university:
- Address:
- Telephone:
- E-mail:
- Website (if available):

3. Applicant's home university Master Thesis supervisor:

- Title(s), initial(s), first name, surname:
- Address for correspondence:

- Telephone:
- E-mail: WeChat:

4. Research field(s)

生物技术 / Biotechnology

基础研究 / Basic Research

重大新药创制 / Major New Drugs Discovery

新材料技术 / Advanced Materials Technology

Design and Fabrication

5. Title of research plan for CSC-UM PhD Programme

Development of therapeutic nanoparticles to combat muscle disease

6. Short summary of research plan (max. 250 words) (A full plan has to be submitted later)

Background: Mitochondrial myopathies is a subgroup of neuromuscular disorders caused by a defect in the mitochondrial energy production system, mainly affecting high energy requiring tissues, like brain and skeletal muscles. Most patients have myopathy, which has a large negative impact on their quality of life and for which there are currently no curative treatment options available. In recent years, antisense and antigene strategies, using respectively antisense oligonucleotides (ASOs) and peptide nucleic acids (PNAs), have been researched as popular approaches for treating several myopathies, including mitochondrial myopathy. Although promising results have been obtained, systemic delivery of ASOs/PNAs to the skeletal muscles remains a significant bottleneck in their clinical development mainly due to low in vivo stability and poor cellular uptake.

Study objective: In this project, we aim to develop bio-degradable nanoparticles as vehicle for ASO/PNA delivery to skeletal muscles. Specifically, we aim to develop nanoparticles that are rapidly taken up by cells, can efficiently incorporate ASOs/PNAs, target the mitochondria and have tunable release of the ASOs/PNAs. Furthermore, we aim to combine the nanoparticle based antisense/antigene delivery vehicles with mesoangioblasts (MABs) stem cell therapy. MABs are being researched as a promising stem cell therapy for neuromuscular disorders as they are able to differentiate into new muscle fibers and fuse with existing (defective) muscle fibers.

Expected Results: In this project, nanoparticles with optimized properties for ASO/PNA delivery in muscle (stem)cells will be developed, characterized and subsequently tested in vitro using MABs from mitochondrial myopathy patients.

Requirements: We are looking for a motivated student with good English communication skills and background in biomedical research. Experience with cell and molecular biology, imaging and nanomaterial synthesis is a plus.

Group's performance:

Dr. S. van Rijt; Publications: 38; H-Index: 19; number of citations 2156
Dr. F. van Tienen; Publications: 22; H-Index: 11; number of citations 492
Prof. dr. H. Smeets; Publications: 295; H-Index: 51; number of citations 10,511

7. Motivation for CSC-UM PhD application (max. 250 words)
Two letters are required, one from the student and one from the promotion team.

Applicant's Curriculum Vitae (if available)
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8. Personal details

Applicant
- Title(s), initial(s), first name, surname:

CSC-UM PhD programme start 1-9-2022

- Surname:
- Nationality: Chinese
- Date of Birth:
- Country and place of birth:

9. Master's degree (if applicable)
Note! Add a copy of your Master's degree to your application

University:
Faculty/discipline:
City and country:
Date:
Grade average:
Title Master's thesis (if applicable):
Thesis grade: