China Scholarship Council – University Maastricht

PhD Programme Application form

Basic information

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1. Information on prospective UM supervisors and Promotor

1a. First Supervisor/promoter:

- Title(s), initial(s), first name, surname:	Prof. dr. A.H. (Andy) Baker
- Research group:	PATH/CARIM
- Address for correspondence:	Postbus 616 6200 MD Maastricht
- Telephone:	+447495498085
- E-mail:	a.baker@maastrichtuniversity.nl

1b. Second Supervisor/copromoter:

- Title(s), initial(s), first name, surname:	Prof. Luyang Yu
- Research group:	Genetics and Regenerative Biology - -
- Address for Correspondence	Zhejiang University, Hangzhou,China
- Telephone:	86-571-88208743
- Email:	luyangyu@zju.edu.cn

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

- Title(s), initial(s), first name, surname:	Prof. dr. J.C. (Judith) Sluimer
- Research group:	Pathology/CARIM
- Address for correspondence:	Postbus 616
	6200 MD Maastricht
- Telephone:	+31644327274
- E-mail:	Judith.sluimer@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:

- Initial(s), first name, surname: Carim-office@maastrichtuniversity.nl
- Research group: CARIM

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

1. Information on the applicant N/A

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

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

2. Details of applicant's home university N/A

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: N/A

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

- Telephone:
- E-mail: WeChat:

4. Research field(s)

Vascular biology, endothelium, cell plasticity, endothelial-to-mesenchyme transition, bioinformatic

- 人类健康与疾病的生物学基础 / Biological Foundations of Human Health and Diseases
- 重大新药创制 / Major New Drugs Discovery

- 前沿技术 / Frontier Technologies
- 信息技术 / Information Technology
- 基础研究 / Basic Research
- 人类健康与疾病的生物学基础 / Biological Foundations of Human Health and Diseases
- 支撑信息技术发展的科学基础 / Scientific Basis for Development of Information Technology

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

Identification and exploitation of miRNAs that control endothelial-to-mesenchyme transition

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

Background: Endothelial-to-mesenchyme transition (EndMT) is a process essential in heart development, but activated in a number of pathological vascular remodelling settings, including atherosclerosis, vein graft failure and pulmonary hypertension. MicroRNAs (miRNA) are critical regulators of endothelial cell homeostasis and dysfunction in disease. We have identified several novel miRNA that control EndMT using a screen of all human miRNA in response to TGFb and interleukin signalling.
Study objective: We will use bioinformatics tools to dissect the target transcriptome of miRNA that can prevent the onset of EndMT and thereby identify key pathways. We will perform wet lab experiments in vitro in primary cell cultures to test the control of EndMT by individual miRNA and identify causal pathways. We will confirm the presence of such mechanisms using human tissue that has stratification into different stages of disease and colocalization with cell-specific markers. Samples from lineage-tracing mice will be used to confirm disease mechanisms in appropriate animal models.
Expected Results: This interdisciplinary project will characterize novel miRNA and describe their mechanism of action and contribution to human disease. Translational opportunities will emerge for intervention in human disease using either small molecules targeting particular pathways or miRNA therapeutics.
Requirements: MSc degree in biological discipline or similar, and prior experience with bioinformatic languages (R and/or python) is advantageous. English communication skills is important. Training will be provided where necessary.

Group's performance: Publications: H-Index: number of citations.

Baker publications 307; h index 72 (SCOPUS), citations 18580
Yu publications 62; h index 21 (WOS), citations 2520
Sluimer publications 107; h index 29 (WOS); citations 3729

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

N/A

Major publications (since 2016)

1. McCracken IR, Dobie R, Bennett M, Passi R, Beqqali A, Henderson NC, Mountford JC, Riley PR, Ponting CP, Smart N, Brittan M, **Baker AH**. Mapping the developing human cardiac endothelium at single cell resolution identifies MECOM as a regulator of arteriovenous gene expression. Cardiovasc Res. 2022 Feb 25:cvac023. doi: 10.1093/cvr/cvac023. Epub ahead of print. PMID: 35212715. IF 13.081; Citations 4
2. Matrone G, Jung SY, Choi JM, Jain A, Leung HE, Rajapakshe K, Coarfa C, Rodor J, Denvir MA, **Baker AH**, Cooke JP. Nuclear S-nitrosylation impacts tissue regeneration in zebrafish. Nat Commun. 2021 Nov 1;12(1):6282. doi: 10.1038/s41467-021-26621-0. PMID: 34725362. IF 17.7; Citations 3
3. Rodor J, Chen SH, Scanlon JP, Monteiro JP, Caudrillier A, Sweta S, Stewart KR, Shmakova A, Dobie R, Henderson BEP, Stewart K, Hadoke PWF, Southwood M, Moore SD, Upton PD, Morrell NW, Li Z, Chan SY, Handen A, Lafyatis R, de Rooij LPMH, Henderson NC, Carmeliet P, Spiroski AM, Brittan M, **Baker AH**. Single-cell RNA-seq profiling of mouse endothelial cells in response to pulmonary arterial hypertension. Cardiovasc Res. 2021 Sep 16:cvab296. doi: 10.1093/cvr/cvab296. Epub ahead of print. PMID: 34528097. IF 13.081; Citations 9
4. Matrone G, Xia B, Chen K, Denvir MA, **Baker AH**, Cooke JP. Fli1+ cells transcriptional analysis reveals an Lmo2-Prdm16 axis in angiogenesis. Proc Natl Acad Sci U S A. 2021 Aug 3;118(31):e2008559118. doi: 10.1073/pnas.2008559118. PMID: 34330825. IF 12.779; Citations 7
5. Lecce L, Xu Y, V'Gangula B, Chandel N, Pothula V, Caudrillier A, Santini MP, d'Escamard V, Ceholski DK, Gorski PA, Ma L, Koplev S, Bjørklund MM, Björkegren JL, Boehm M, Bentzon JF, Fuster V, Kim HW, Weintraub NL, **Baker AH**, Bernstein E, Kovacic JC. Histone deacetylase 9 promotes endothelial-mesenchymal transition and an unfavorable atherosclerotic plaque phenotype. J Clin Invest. 2021 Aug 2;131(15):e131178. doi: 10.1172/JCI131178. PMID: 34338228; PMCID: PMC8321575. IF 19.456; Citations 10
6. Monteiro JP, Rodor J, Caudrillier A, Scanlon JP, Spiroski AM, Dudnakova T, Pflüger-Müller B, Shmakova A, von Kriegsheim A, Deng L, Taylor RS, Wilson-Kanamori JR, Chen SH, Stewart K, Thomson A, Mitić T, McClure JD, Iynikkel J, Hadoke PWF, Denby L, Bradshaw AC, Caruso P, Morrell NW, Kovacic JC, Ulitsky I, Henderson NC, Caporali A, Leisegang MS, Brandes RP, **Baker AH**. MIR503HG Loss Promotes Endothelial-to-Mesenchymal Transition in Vascular Disease. Circ Res. 2021 Apr 16;128(8):1173-1190. doi: 10.1161/CIRCRESAHA.120.318124. Epub 2021 Mar 11. PMID: 33703914; PMCID: PMC7610629. IF 23.213; Citations 15
7. McCracken IR, Saginc G, He L, Huseynov A, Daniels A, Fletcher S, Peghaire C, Kalna V, Andaloussi-Mäe M, Muhl L, Craig NM, Griffiths SJ, Haas JG, Tait-Burkard C, Lendahl U, Birdsey GM, Betsholtz C, Noseda M, **Baker AH**, Randi AM. Lack of Evidence of Angiotensin-Converting Enzyme 2 Expression and Replicative Infection by SARS-CoV-2 in Human Endothelial Cells. Circulation. 2021 Feb 23;143(8):865-868. doi: 10.1161/CIRCULATIONAHA.120.052824. Epub 2021 Jan 6. PMID: 33405941; PMCID: PMC7899720. IF 39.918; Citations 103
8. Nosalski R, Siedlinski M, Denby L, McGinnigle E, Nowak M, Cat AND, Medina-Ruiz L, Cantini M, Skiba D, Wilk G, Osmenda G, Rodor J, Salmeron-Sanchez M, Graham G, Maffia P, Graham D, **Baker AH**, Guzik TJ. T-Cell-Derived miRNA-214 Mediates Perivascular Fibrosis in Hypertension. Circ Res. 2020 Apr 10;126(8):988-1003. doi: 10.1161/CIRCRESAHA.119.315428. Epub 2020 Feb 17. PMID: 32065054; PMCID: PMC7147427. IF 23.213; Citations 34
9. Mahmoud AD, Ballantyne MD, Miscianinov V, Pinel K, Hung J, Scanlon JP, Iyinikker J, Kaczynski J, Tavares AS, Bradsahw AC, Mills NL, Newby DE, Caporali

A, Gould GW, George SJ, Ulitsky I, **Sluimer JC**, Rodor J, **Baker AH**.The Human- and smooth muscle cell-enriched lncRNA SMILR promotes proliferation by regulating mitotic CENPF mRNA and drives cell-cycle progression which can be targeted to limit vascular remodelling. Circulation Research. 2019 Jul 24. doi: 10.1161/CIRCRESAHA.119.314876. IF 23.213; Citations 74

10. Li Z, Solomonidid EG, Meloni M, Taylor RS, Duffin R, Dobie R, Magalhaes MS, Henderson B, Louwe PA, D'Amico G, Hodivala-Dilke KM, Shah AM, Mills NL, Simons BD, Gray GA, Henderson, **Baker AH**, Brittan M. Single cell transcriptome analyses reveal novel targets modulating cardiac neovascularisation by resident endothelial cells following myocardial infarction. European Heart Journal. 2019 June 04. ehz305, https://doi.org/10.1093/eurheartj/ehz305 IF 35.855; Citations 103
11. McCracken I, Taylor R, Kok F, De La Cuesta F, Dobie R, Henderson B, Mountford J, Caudriller A, Henderson N, Ponting C, **Baker AH**. Transcriptional dynamics of pluripotent stem cell-derived endothelial cell differentiation revealed by single-cell RNA sequencing, European Heart Journal, Volume 41, Issue 9, 1 March 2020, Pages 1024–1036, https://doi.org/10.1093/eurheartj/ehz351 IF 35.855; Citations 36
12. Ballantyne, MD, Dakin R, Pinel K, Vesey AT, Diver L, Mackenze R, Garcia R, Welsh P, Sattar N, Hamilton G, Joshi N, Dweck MR, Miano JM, Newby DE, McDonald RA, **Baker AH**. Smooth muscle enriched long non-coding RNA (SMILR) regulates cell proliferation. Circulation. 2016 May 24;133(21):2050-65. doi: 10.1161/CIRCULATIONAHA.115.021019 IF 39.918; Citations 186
13. ZhuX,QiuC,WangY,JiangY,ChenY,FanL,RenR,WangY,ChenY,FengY,ZhouX,ZhuY, GeZ,Lai D, Qin L, Simons M, **Yu L***. FGFR1 SUMOylation coordinates endothelial angiogenic signaling in angiogenesis. Proc Natl Acad Sci U S A. 2022 Jun 28;119(26):e2202631119. IF 12.779; Citations 1
14. Zhang C, Wu S, Chen E, **Yu L**, Wang J, Wu M. ALX1-transcribed LncRNA AC132217.4 promotes osteogenesis and bone healing via IGF-AKT signaling in mesenchymal stem cells. Cell Mol Life Sci. 2022 May 31;79(6):328. IF 9.207; Citations -
15. Gong L, Zhang Q, Pan X, Chen S, Yang L, Liu B, Yang W, **Yu L**, Xiao ZX, Feng XH, Wang H, Yuan ZM, Peng J, Tan WQ, Chen J. p53 Protects Cells from Death at the Heatstroke Threshold Temperature. Cell Rep. 2019 Dec 10;29(11):3693-3707. IF 9.995; Citations 7
16. Zhu X, Ding S, Qiu C, Shi Y, Song L, Wang Y, Wang Y, Li J, Wang Y, Sun Y, Qin L, Chen J, Simons M, Min W, **Yu L***. SUMOylation Negatively Regulates Angiogenesis by Targeting Endothelial NOTCH Signaling. Circ Res. 2017; 121(6):636-649. IF 23.213; Citations 23
17. Qiu C, Wang Y, Zhao H, Qin L, Shi Y, Zhu X, Song L, Zhou X, Chen J, Zhou H, Zhang H, Tellides G, Min W, **Yu L***. The critical role of SENP1-mediated GATA2 deSUMOylation in promoting endothelial activation in graft arteriosclerosis. Nature Communications. 2017; 8:15426. IF 17.7; Citations 38
18. Madrigal-Matute J, de Bruijn J, van Kuijk K, Riascos-Bernal DF, Diaz A, Tasset I, Martín-Segura A, Gijbels MJJ, Sander B, Kaushik S, Biessen EAL, Tiano S, Bourdenx M, Krause GJ, McCracken I, **Baker AH**, Jin H, Sibinga NES, Bravo-Cordero JJ, Macian F, Singh R, Rensen PCN, Berbée JFP, Pasterkamp G, **Sluimer JC**, Cuervo AM. Protective role of chaperone-mediated autophagy against atherosclerosis. Proc Natl Acad Sci U S A. 2022 Apr 5;119(14):e2121133119. doi: 10.1073/pnas.2121133119. Epub 2022 Apr 1. PMID: 35363568. IF 12.779; Citations 9
19. van Kuijk K, Demandt JAF, Perales-Patón J, Theelen TL, Kuppe C, Marsch E, de Bruijn J, Jin H, Gijbels MJ, Matic L, Mees BME, Reutelingsperger CPM, Hedin U, Biessen EAL, Carmeliet P, **Baker AH**, Kramann RK, Schurgers LJ, Saez-

Rodriguez J**, Sluimer JC**. Deficiency of myeloid phd proteins aggravates atherogenesis via macrophage apoptosis and paracrine fibrotic signaling. Cardiovasc Res 2021 (accepted 10.1093/cvr/cvab152) IF 13.081, Citations 3

20. Jin H, Goossens P, Juhasz P, Eijgelaar W, Manca M, Karel J, Smirnov E, Sikkink CJ, Mees BM, Waring O, van Kuijk K Fazzi GE, Gijbels MJ, Kutmon M, Evelo CT, Hedin U, Daemen MJ, **Sluimer JC**, Matic L, Biessen EA. Integrative multi-omics analysis of human atherosclerosis reveals a serum response factor driven network associated with intraplaque haemorrhage. Clinical and Translational Medicine 2021 (doi.org/10.1002/ctm2.458) IF 8.554, Citations 18
21. Vacante F, Rodor J, Mahmoud A, Miller E, Bruijn de J, Van Kuijk K, Gijbels MJ.; Scanlon JP, Doran AC, Newby D, Giacca M, Hadoke P, Denby L, **Sluimer JC, Baker AH**. CARMN Loss Regulates Smooth Muscle Cells and Accelerates Atherosclerosis in Mice. (Circ Res, 2021 128:9, 1258-1275) IF 23.213, Citations 21
22. Van Kuijk K, Kuppe C, Betsholtz C, Vanlandewijck M, Kramann R, **Sluimer JC**. Heterogeneity and plasticity in healthy and atherosclerotic vasculature explored by single cell sequencing. Cardiovasc Res. 2019, 115:1705-1715. IF 13.081, Citations 27
23. Marsch E, Demandt JA, Theelen TL, Tullemans BM, Wouters K, Boon MR, van Dijk TH, Gijbels MJ, Dubois LJ, Meex SJ, Mazzone M, Hung G, Fisher EA, Biessen EA, Daemen MJ, Rensen PC, Carmeliet P, Groen AK, **Sluimer JC**. Deficiency of the oxygen sensor prolyl hydroxylase 1 attenuates hypercholesterolaemia, atherosclerosis, and hyperglycaemia. Eur heart J 2016 37(39): 2993-2997 IF 35.855, Citations 45

Applicant's Curriculum Vitae (if available) N/A

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8. Personal details N/A

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) N/A

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: