

Personal Information:

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Professional career:

- 2014** Professor (BOF-Zap), Laboratory of Experimental Cardiology, Department of Cardiovascular Sciences, KULeuven
- 2014-2016** Affiliated Lecturer, University of Cambridge.
- 2010-2014** Group leader with Tenure, Babraham Institute, Cambridge, UK.
- 2005-2012** Royal Society University Research Fellow, Department of Pharmacology, University of Cambridge, Cambridge, UK
- 2004-2010** Group Leader (Tenure track), Babraham Institute, Cambridge, UK.
- 2001-2004** Postdoctoral Research, M. D. Bootman and Sir M. J. Berridge FRS, Babraham Institute, Cambridge, UK.
- 1997-2001** Postdoctoral Research, P. Camacho, Dept. Physiology, University of Texas Health Science Center, San Antonio, Texas.

Education:

- 1993-97** Ph.D., supervised by D. H. Llewellyn and A. K. Campbell, Dept. Medical Biochemistry, University of Cardiff, Cardiff, UK.
- 1989-92** B.Sc., Zoology and Genetics. Dept. Pure and Applied Biology, UWCC, Cardiff, UK.

Research Themes and strategies:

Signalling and the epigenome in the control of cardiac myocyte fate during health, disease and ageing. This research is divided between:

1. *Defining the contribution of the epigenome to determining the differentiated state of adult cardiac myocytes and in the remodeling of the heart in response to physiological and pathological stressors.* Through these analysis we aim to identify strategies that can be employed to reverse the deleterious functional remodelling associated with disease and ageing. These strategies will target reactivation of cell cycle activity to improve regeneration of damaged tissue and suppression of disease associated gene transcription programmes. To these ends we employ next generation sequencing including single cell sequencing, genome wide epigenomic analysis, genetic and surgical models of cardiac disease, and human tissue.
2. *Delineating contribution of Ca²⁺ signalling to disease associated structural, functional and physiological remodelling of cardiac myocytes.* A particular interest is in the twin roles of Ca²⁺ signaling microdomains regulated by IP₃ in disease and ageing associated remodelling of excitation contraction coupling and activation of hypertrophic gene transcription. Specifically how specificity is encoded by a given Ca²⁺ signal. To these ends we perform combined cellular electrophysiology and Ca²⁺ imaging approaches, genetically encoded Ca²⁺ indicators, tissue preparations, large (pig) and small mammal models of disease, human cell/tissue analysis and super resolution imaging.

Publications (Selection of pubs, h index 42):

1. Gilbert, G., K. Demydenko, E. Dries, R.D. Puertas, X. Jin, K. Sipido, and H.L. **Roderick**. 2019. Calcium Signaling in Cardiomyocyte Function. Cold Spring Harb Perspect Biol doi:10.1101/cshperspect.a035428
2. Nagaraju, C.K., E.L. Robinson, M. Abdesslem, S. Trenson, E. Dries, G. Gilbert, S. Janssens, J. Van Cleemput, F. Rega, B. Meyns, **H.L. Roderick**, R.B. Driesen,

- and **K.R. Sipido**. 2019. Myofibroblast Phenotype and Reversibility of Fibrosis in Patients With End-Stage Heart Failure. *J Am Coll Cardiol*. 73:2267–2282. doi:10.1016/j.jacc.2019.02.049.
3. Smyrniak, I., N. Goodwin, D. Wachten, J. Skogestad, J.M. Aronsen, E.L. Robinson, K. Demydenko, A. Segonds-Pichon, D. Oxley, S. Sadayappan, **K. Sipido**, M.D. Bootman, and **H.L. Roderick**. 2018. Contractile responses to endothelin-1 are regulated by PKC phosphorylation of cardiac myosin binding protein-C in rat ventricular myocytes. *J Mol Cell Cardiol*. 117:1–18. doi:10.1016/j.yjmcc.2018.02.012.
 4. Nagaraju, C.K., E. Dries, N. Popovic, A.A. Singh, P. Haemers, **H.L. Roderick**, P. Claus, **K.R. Sipido**, and R.B. Driesen. 2017. Global fibroblast activation throughout the left ventricle but localized fibrosis after myocardial infarction. *Sci Rep*. 7:10801. doi:10.1038/s41598-017-09790-1.
 5. Thienpont, B., J.M. Aronsen, E.L. Robinson, H. Okkenhaug, E. Loche, A. Ferrini, P. Brien, K. Alkass, A. Tomasso, A. Agrawal, O. Bergmann, I. Sjaastad, W. Reik, and **H.L. Roderick**. 2017. The H3K9 dimethyltransferases EHMT1/2 protect against pathological cardiac hypertrophy. *J Clin Invest*. 127:335–348. doi:10.1172/JCI88353.
 6. Vujic, A., Robinson, E.L., Ito, M., Haider, S., Ackers-Johnson, M., See, K., Methner, C., Figg, N., Brien, P., **Roderick, H.L.**, Skepper, J., Ferguson-Smith, A. and Foo, R.S. (2015). Experimental heart failure modelled by the cardiomyocyte-specific loss of an epigenome modifier, DNMT3B. *J Mol Cell Cardiol* 82, 174–183
 7. Tingare, A., Thienpont, B., and **Roderick, H.L.** (2013) Epigenetics in the heart: the role of histone modifications in cardiac remodeling. *Biochemical Society Transactions*. 41:789-796.
 8. Drawnel, F.M., Archer, C.R., and **Roderick, H.L.** (2013). The role of the paracrine/autocrine mediator endothelin-1 in regulation of cardiac contractility and growth. *Br J Pharmacol*. 168:296–317
 9. Drawnel, F.M., Wachten, D., Molkentin, J.D., Maillet, M., Aronsen, J.M., Swift F, Sjaastad, I., Liu, N., Catalucci, D., Mikoshiba, K., Hisatsune, C., Okkenhaug, H., Andrews, S.R., Bootman, M.D., **Roderick, H.L.** (2012) Mutual antagonism between IP3R2 and miRNA-133a regulates calcium signals and cardiac hypertrophy. *J Cell Biol*. 199:783–798. Editorial Highlight 'In this Issue' and Cover Image.
 10. Harzheim, D., Movassagh, M., Foo, R.S., Ritter, O., Tashfeen, A., Conway, S.J., Bootman, M.D. and **Roderick, H.L.** (2009) Increased InsP3Rs in the junctional sarcoplasmic reticulum augment Ca²⁺ transients and arrhythmias associated with cardiac hypertrophy. *Proc Natl Acad Sci U S A*, **106**, 11406-11411. (Highlighted in Physiology)
 11. Higazi, D.R., Fearnley, C.J., Drawnel, F.M., Talasila, A., Corps, E.M., Ritter, O., McDonald, F., Mikoshiba, K., Bootman, M.D. and **Roderick, H.L.** (2009) Endothelin-1-stimulated InsP3-induced Ca²⁺ release is a nexus for hypertrophic signaling in cardiac myocytes. *Mol Cell*, **33**, 472-482. Editor's Choice Science Signalling.
 12. Bootman, M.D., Fearnley, C., Smyrniak, I., Macdonald, F. and **Roderick, H.L.** (2009) An update on nuclear calcium signalling. *J Cell Sci*, **122**, 2337-2350. Review.
 13. **Roderick, H.L.** and Cook, S.J. (2008) Ca²⁺ signalling checkpoints in cancer: remodelling Ca²⁺ for cancer cell proliferation and survival. *Nat Rev Cancer*, **8**, 361-375.
 14. Szado, T., Vanderheyden, V., Parys, J.B., De Smedt, H., Rietdorf, K., Kotelevets, L., Chastre, E., Khan, F., Landegren, U., Soderberg, O., Bootman, M.D. and **Roderick, H.L.** (2008) Phosphorylation of inositol 1,4,5-trisphosphate receptors by protein kinase B/Akt inhibits Ca²⁺ release and apoptosis. *Proc Natl Acad Sci U S A*, **105**, 2427-2432. Highlighted by Faculty of 1000.
 15. Chen, R., Valencia, I., Zhong, F., McColl, K.S., **Roderick, H.L.**, Bootman, M.D., Berridge, M.J., Conway, S.J., Holmes, A.B., Mignery, G.A., Velez, P. and Distelhorst, C.W. (2004) Bcl-2 functionally interacts with inositol 1,4,5-trisphosphate receptors to regulate calcium release from the ER in response to inositol 1,4,5-trisphosphate. *J Cell Biol*, **166**, 193-203. Editor's Choice Science STKE.

16. Hanson, C.J., Bootman, M.D. and **Roderick, H.L.** (2004) Cell signalling: IP3 receptors channel calcium into cell death. *Curr Biol*, **14**, R933-935. Review
17. Kasri, N.N., Holmes, A.M., Bultynck, G., Parys, J.B., Bootman, M.D., Rietdorf, K., Missiaen, L., McDonald, F., De Smedt, H., Conway, S.J., Holmes, A.B., Berridge, M.J. and **Roderick, H.L.** (2004) Regulation of InsP3 receptor activity by neuronal Ca²⁺-binding proteins. *Embo J*, **23**, 312-321.
18. Berridge, M.J., Bootman, M.D. and **Roderick, H.L.** (2003) Calcium signalling: dynamics, homeostasis and remodelling. *Nat Rev Mol Cell Biol*, **4**, 517-529.
19. **Roderick, H.L.**, Lechleiter, J.D. and Camacho, P. (2000) Cytosolic phosphorylation of calnexin controls intracellular Ca(2+) oscillations via an interaction with SERCA2b. *J Cell Biol*, **149**, 1235-1248. Highlighted in the journal.

Research Funding:

Grants from the Flemish Government (FWO), KULeuven, KG Jebsen Center for Cardiac Research (KGJ-CCR), Oslo, Norway and Australian Research Council.

Memberships:

European Calcium Society, European Society of Cardiology Working Group on Cardiac Cellular Electrophysiology and Working group on Myocardial Function. International Society for Heart Research.

Miscellaneous:

- Editorial board member of Cardiovascular Research and Frontiers in Oncology.
- Ad hoc Referee for Cell, Nature, Circulation, PNAS and other top line journals.
- Referee for National Research funding organisations: MRC, BBSRC, Wellcome and BHF in the UK, FWO (Belgium), CNRS (France), NWO (Netherlands) and Telethon (Italy).

Awards:

- Odysseus Award from the FWO, Belgium (2014-2019)
- Royal Society University Research Fellowship, The Royal Society, UK (2004-2012)