DRAFT JUNE 2017: DO NOT SUBMIT TO FUNDING AGENCIES.

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OBJECTIVES

My life goal is to improve the lives of critically ill patients using a physical sciences approach. I will achieve the goal by hypothesis testing and generating evidence for the therapies that are being developed within the KCRU. I have already commenced my research activity within the prestigious group of Prof. Christopher McIntyre. I aim to secure external funding by 2020 (three years) which will lead to my establishing a computational physiology laboratory within the Unit by 2022 (five years). In consultation with my leadership, I intend establishing my student supervision and teaching activities at the earliest opportunity. The outcomes of our research are expected to be of interest to the academic-clinical community, as well as being commercially exploitable. To pursue the cutting edge interdisciplinary research, it is crucial for me to take advantage of expertise that is available in Lawson's and Robart's Institutes, and University of Western Ontario departments. I have commenced my efforts towards building mutually beneficial collaborations that will further elevate the merit and intensity of my research.

NATIONALITY: British. DATE OF BIRTH: 30th January, 1974.

EDUCATION

1. 30/09/1997 – 30/09/2000. Ph.D. in Applied Mathematics. Institution: Department of Applied Mathematics, University of Hull, Hull, UK.
2. 30/09/2015-30/06/2016. Post-graduate certificate in secondary education. University of Manchester, Manchester, UK.
3. 15/06/1994 – 15/05/1996. MPHYS Master of Science in Theoretical Physics (First Class). Institution: Department of Physics, University of Pune, Pune, India.
4. 15/06/1991 – 15/05/1996. Bachelor of Science in Physics (First Class with Distinction). Institution: Department of Physics, University of Pune, Pune, India.

PREVIOUS APPOINTMENTS

1. 1/03/2015-date: Research Fellow. Faculty of Medical and Human Sciences, University of Manchester. Project: Modelling of the Human and Mouse Sinoatrial Node Dsysfunction as a Criticality-Percolation Phenomenon.
2. 1/09/2011-date: Research Fellow. CEMPS, University of Exeter. Project: Development of cardiac simulator "Beatbox". (Currently honorary research fellow).
3. 15/07/2011-10/09/2011: Visiting Research Fellow. High Performance Computing Europa 2011 Visitor, CINECA High Performance Computing facility, Italy. Project: Development of 1D and 2D parallel bi-domain solvers. **(PI).**
4. 1/04/2011-31/07/2011: Research Associate. Bioengineering Laboratory, University of Bologna, Italy. Project: ECG software, cardiac modelling developer.
5. 15/07/2005-15/08/2010: Research Associate, Biological Physics Group, School of Physics and Astronomy, University of Manchester. Projects: a) Multi-scale modelling of atrial fibrillation. b) Development of biophysically detailed electrophysiological cell model of mouse sino-atrial node primary pacemaker.
6. 1/04/2003-1/06/2005: Research Associate, School of Biomedical Sciences, University of Leeds. Project: Development of uterus electrophysiological cell model.
7. 01/01/2001-01/03/2003: Research Associate, Division of Imaging Sciences, King's College London. Project: Finite element simulation of bone mechanics.
8. 29/09/1997-29/09/2000: Graduate Teaching Assistant, Applied Mathematics, University of Hull. Duties: Teaching Maths tutorials, PhD programme in Applied Maths.

TECHNICAL EXPERTISE: A: Cell and organ model development; B: Numerical solvers; C: Scientific

libraries: CVODE, PETSc, METIS; D: Development of cardiac simulators; E: HPC and visualisation; F: Development and implementation of novel algorithms; G: Sensitivity analysis.

CONFERENCE ORGANISATION: Co-organiser of BeatBox workshop, Manchester, 24-25 June 2013.

FELLOWSHIPS AND AWARDS

Fellowship: 15/07/2011- 10/09/ 2011. HPC Europa 2011 Visiting Fellowship, CINECA, Bologna, Italy. Project: Development of 1D and 2D parallel bi-domain solvers. **(PI).**

Awards:

1) Winner of "Physics Association" prizes during undergraduate and postgraduate studies.
2) Union Grants Commission (India) funded scholar during undergraduate and postgraduate studies.
3) Winner of Graduate Teaching Assistantship during Ph.D. in University of Hull, UK.

JOURNAL PEER REVIEW EXPERIENCE

Reviewer of following journals: Nature Translational Psychiatry, Plos Computational Biology, Plos ONE, Computers in Medicine, Chaos, Biophysical Journal, American Journal of Physiology, IEEE EMBC.

Grants review: I have reviewed a grant application for the UK Engineering and Physical Research Council.

GRANTS (INCLUDING TRAVEL AND OTHER)

- British Heart Foundation (BHF) project grant application entitled: "A Computational Study of Clinical Myocardial Stunning and Cardioprotection Mechanisms". (being revised under supervision of Prof. Maarten Taal and colleagues).
- BHF travel awards (2006-2007) (£300 each) for poster presentations at ISCE 2006, Canada and Computers in Cardiology 2007, Lyon, France
- Departmental Fund (2007) (£300) for talk presentation at FIMH 2007, Salt Lake City, Utah
- Royal Society Travel Award (£692) for talk presentation at Physiological Society 2009 Meeting, Dublin
- HPC Visitor Funding to CINECA, Bologna, Italy (July 15 to August 31, 2011) **(PI)**
- PRACE introductory access (May 2012 till December 2012) **(PI)**
- Bridging the Gaps Project. University of Exeter, UK. (£800) (March 2013 till July 2013). Project title: "Imaging Small Animal Hearts" **(PI).**
- Physiological Society Awards for talk and poster presentations at the UK Physiological Society General meetings (various amounts during 2008-2014).
- Physiological Society Awards for outreach (2010: £1000,2014: £1000)

INVITED TALKS

I was invited by Dr. Chris Cantwell to give a talk in the "Computational Cardiac Electrophysiology" workshop held on 15-16 May, 2014 in Imperial College, London, UK.

LEADERSHIP

I am motivated and original and my focus is towards achieving specific targets in my studies. I have endeavoured to implement my scientific ambitions through research in depth studies and scientific publications. I have gained access to one of the world's largest supercomputer in the National Institute of Computational Sciences, USA, to execute large and high through put simulations of studies that are now nearing completion. I have received funding from the University of Exeter "Bridging the Gaps" programme to lead a project exploring the viability of imaging small animal hearts. I have taken the initiative to commence implementation of my research ambitions and ideas through this project grant application. To this end, I have independently developed this novel forward looking project proposal which will assist me in serving society through my inter-disciplinary research activity.

SUPERVISION OF UNDERGRADUATE AND POSTGRADUATE DISSERTATIONS

I have supervised the following postgraduate theses. All theses led to presentations in international conferences, and several led to international journal publications, as listed in my list of publications below.

1) University of Manchester, UK

PhD thesis title: "Mathematical model of action potentials of mouse sinoatrial node cells with molecular bases" Jian Yu (2009). (#17 in list of publications).

PhD thesis title: "3D anatomical-torso model of atrial fibrillation" Jon Stott (2009). (#20 in list of publications).

PhD thesis title: "Tissue Engineering of the Human Atrium – Approaching Mechanisms of Genesis and Control of Atrial Fibrillation". PR Law (2011). (book chapter)

Masters thesis title: "Proarrhythmia due to IK1 KCNJ2 mutation". Hannah Moore (2008). (#14 in list of publications).

Masters thesis title: "A Model of Mouse Atrial Cell". David Lomax (2010).

Masters thesis title: "Computer Simulation of Human Atrial Fibrillation due to S140G and V141M Mutations of the Kv7.1 Gene". Catherine Astles and Thomas Burchell (2011).

2) University of Bologna, Italy

Masters thesis title: "Modelling the effects of elevated potassium on human ECG" G Callisesi (2011). (Conference publications)

Masters thesis title: "Modelling the role of IKs current in cardiac electrophysiology under PUFA-Omega 3 diets" Thomas Stary (2011). (#24 in list of publications).

3) University of Liverpool/Exeter, UK

Masters thesis title: "Bidomain simulations on the effect of extracellular potassium on cardiac conduction properties" Andrea Bracci (2012). (Conference publications)

LIST OF PUBLICATIONS

I have over 85 publications, including 30 peer reviewed journal papers and a book chapter.

Manuscripts under review and preparation.

Sanjay Kharche 1,3, Aaron So 2, Elena Qirjazi 1, Ting-Yim Lee 2, Chris Ellis 3, Daniel Goldman 3, C W McIntyre 1,3. Personalised computational assessment of local heterogeneity in dialysis patients' ventricles. (in preparation for Frontiers in Physiology special issue).

Tom Sheard, Sanjay Kharche, Christian Pinali and Holly A. Shiels. 3-d ultrastructural study of sarcoplasmic reticulum forming calcium release units in avian cardiomyocytes. (submitted).

Book Chapter

S R Kharche, Phillip R. Law and Henggui Zhang (2009). Studying Ion Channel Dysfunction and Arrythmogenesis in the Human Atrium: A Computational Approach, Recent Advances in Biomedical Engineering, Ganesh R Naik (Ed.), ISBN: 978-953-307-004-9, InTech, DOI: 10.5772/7468.

Primary Journal Publications

1**. S Kharche**, JA Howarth. The inward solidification of a liquid cylinder with periodic axial perturbation of the boundary geometry, and constant temperature or heat flux. Int. Comms. Heat and Mass. (2000); **27 (7)**: 913-923.

2**. S Kharche**, JA Howarth. The inward solidification of a liquid cylinder with periodic axial perturbation of the boundary temperature or heat flux. Int. Comms. Heat and Mass. (2000); **27 (7)**: 903-912.

3**. S Kharche**, H Zhang, AV Holden. Hypertrophy in rat virtual left ventricular cells and tissue. A. F. Frangi et al. (Eds): LNCS (2005); **3504**: 153-161.

4. AP Benson, RH Clayton, AV Holden, **S Kharche**, WC Tong. Endogenous driving and synchronization in cardiac and uterine tissues: bifurcations and local coupling. Philos. Tans. Roy. Soc. **364 (1842)**: 1313-1327; (2006).

5. **S Kharche**, G Seemann, J Leng, AV Holden, CJ Garratt, H Zhang. Scroll Waves in 3D Virtual Human Atria: A Computational Study. F.B. Sachse and G. Seemann (Eds.): LNCS (2007); **4466**: 129–138.

6. Taggart MJ, Blanks A, **Kharche S**, et al. Towards understanding the myometrial physiome:

approaches for the construction of a virtual physiological uterus. BMC Pregnancy Childbirth. (2007). 7 (Sup: 1:S3).
7. Sallé L, **Kharche S**, Zhang H, Brette F. Mechanisms underlying adaptation of action potential duration by pacing rate in rat myocytes. PBMB 96 **(1-3)**: 305-20. 2008. (joint *first author*) (I.F.: 5.009).
8. H Zhang, C J Garratt**, S Kharche**, A V Holden. Remodelling of cellular excitation (reaction) and intercellular coupling (diffusion) by chronic atrial fibrillation represented by a reaction-diffusion system, Physica D: Nonlinear Phenomena. **238**: 976-983; 2009. (I.F.: 1.735).
9. H Zhang, **S Kharche**, A V Holden, J C Hancox. Repolarisation and vulnerability to re-entry in the human heart with short QT syndrome arising from KCNQ1 mutation--A simulation study. PBMB. **96 (1-3)**: 2008. (I.F.: 5.009).
10. Howarth FC, Chandler NJ, **Kharche S**, et al. Effects of streptozotocin-induced diabetes on connexin43 mRNA and protein expression in ventricular muscle. Mol Cell Biochem. (2008); **319(1-2)**: 105-114. (I.F.: 1.9).
11. **S Kharche**, G Seemann, L Margetts, J Leng, A V Holden, H Zhang. Simulation of clinical electrophysiology in 3D human atria: a high-performance computing and high-performance visualization application. Conc. Comput.: Practice and Experience. (2008); **20(11):** 1317-1328.
12. H Zhang, T Tao, **S Kharche**, S M Harrison. Modelling changes in transmural propagation and susceptibility to arrhythmia induced by volatile anaesthetics in ventricular tissue. J. Theo. Biol. 257(2): pp. 279-291. (I.F.: 2.3).
13. H. Wright, R.H. Crompton, **S. Kharche**, P. Wenisch. Steering and visualization: Enabling technologies for computational science. Future Generation Computer Systems (2010); **26(3):** 506-513. (I.F.: 1.5).
14. **S Kharche,** Garratt CJ, Boyett MR, Inada S, Holden AV, Hancox JC, Zhang H. Atrial proarrhythmia due to increased inward rectifier current (I_{K1}) arising from KCNJ2 mutation – A simulation study. PBMB. **98: (2-3)**: pp. 186-197; (2008) (I.F.: 5).
15**. S Kharche,** G N Lüdtke, S Panzeri and H Zhang. A Global Sensitivity Index for Biophysically Detailed Cardiac Cell Models: A Computational Approach. LNCS (2009); 5528: 366-375.
16. Tong WC, Choi CY, **Kharche** S et al. A computational model of the ionic currents, Ca2+ dynamics and action potentials underlying contraction of isolated uterine smooth muscle. PLoS One. 2011. 6(4):e18685
17. **Kharche** S, Yu J, Lei M, Zhang H. A mathematical model of action potentials of mouse sinoatrial node cells with molecular bases. Am J Physiol (2011) 301(3): H945-63.
18. M Zi, TE Kimura, W Liu, J Jin, J Higham, **S Kharche**, et al. Mitogen-activated protein kinase kinase 4 deficiency in cardiomyocytes causes connexin 43 reduction and couples hypertrophic signals to ventricular arrythmogenesis. J Biol Chem. (2011) 286 (20): 17821-30.
19. Aslanidi OV,…, Holden AV, **Kharche** S, et al. Virtual tissue engineering of the human atrium: modelling pharmacological actions on atrial arrythmogenesis. Eur J Pharm Sci. (2012) 46(4): 209-21.
20. **Kharche** S et al. Pro-arrhythmogenic effects of the S140G KCNQ1 mutation in human atrial fibrillation - insights from modelling. J Physiol. (2012). 590(8): 4501-14.
21. MA Colman, OV Aslanidi, **SR Kharche,** et al. Pro-arrhythmogenic Effects of Atrial Fibrillation Induced Electrical Remodelling- Insights from 3D Virtual Human Atria. J Physiol. (2013). 591(17): 4249-72.
22. **Kharche SR,** Stary T, Colman MA, Biktasheva IV, Workman AJ, Rankin AC, Holden AV, Zhang H. Effects of human atrial ionic remodelling by β-blocker therapy on mechanisms of atrial fibrillation: a computer simulation**.** Europace (2014). 16 (10): 1524-33
23. Hancox JC, **Kharche S,** El Harchi A, Stott J, Law P, Zhang H. In silico investigation of a KCNQ1 mutation associated with familial atrial fibrillation. J Electrocardiol. (2014). 47(2): 158-65.
24. C Moreno, A Oliveras, **S R Kharche**, M Guizy, A de la Cruz, N Comes, T Starý, I Baró, G Loussouarn, S Severi, A Felipe, C Valenzuela. Effects of n-3 polyunsaturated fatty acids on the function, expression and location of Kv7.1 channels. *Cardiovasc Res. (2015). 105(2): 223-232.IF:5.9.*
25. **Sanjay R. Kharche**, Irina V. Biktasheva, Gunnar Seemann, Henggui Zhang, Vadim N. Biktashev A Computer Simulation Study of Anatomy Induced Drift of Spiral Waves in the Human Atrium *BioMed Research International (2015). 2015: 731386. IF: 2.7*.
26. Logantha SJ, Stokke MK, Atkinson AJ, Kharche SR, Parveen S, Saeed Y, Sjaastad I, Sejersted

OM, Dobrzynski H. Ca(2+)-Clock-Dependent Pacemaking in the Sinus Node Is Impaired in Mice with a Cardiac Specific Reduction in SERCA2 Abundance. Front Physiol. 2016. 7: 197 (IF 5).
27. Zhao J, Kharche SR, Hansen BJ, Csepe TA, Wang Y, Stiles MK, Fedorov VV. Optimization of catheter ablation of atrial fibrillation: insights gained from clinically-derived computer models. Int J Mol Sci. 2015;16(5):10834-54. (IF 2.8).
28. Mario Antonioletti, Vadim N. Biktashev, Adrian Jackson, **Sanjay R. Kharche**, Tomas Stary, Irina Biktasheva. BeatBox — HPC Simulation Environment for Biophysically and Anatomically Realistic Cardiac Electrophysiology. PLoS ONE 12(5): e0172292. https://doi.org/10.1371/journal.pone.0172292
29. **Sanjay R Kharche**, Edward Vigmond, Igor Efimov, Halina Dobrzynski. Computational assessment of the functional role of sinoatrial node exit pathways in the human heart. (accepted, Plos ONE).
30. Sanjay Kharche, C W McIntyre. Computational assessment of arrhythmia potential in the heterogeneously perfused ventricle. (Lecture Notes in Computer Science, 2017, accepted).
Selected conference publications
27. AP Benson, AV Holden, **S Kharche**, WC Tong. From gene expression to tissue dynamics via continuation algorithms: pacemaking in the heart. In Plotkin G (Ed). Proceedings of the International Workshop on Computational Methods in Systems Biology, Edinburgh. 3-5 April 2005.pp 192-203.
28. **S Kharche**, H Moore, CJ Garatt, JC Hancox, H Zhang. Gain-of-function in Kir2.1 and its effects on atrial fibrillation in homogenous virtual human atrial tissue: a computer simulation study. International Society of Computerized Electrophysiology, Niagara-on-the-Lake, April 2006.
29**. S Kharche**, H Zhang, RH Clayton, AV Holden. Simulation of Hypertrophy in rat left ventricular cells. Computers in Cardiology. (2004); **31**: 513-516.
30**. S Kharche**, AV Holden, H Zhang. Vulnerability in one-dimensional transmural model of human ventricular tissue in heart failure. Computers in Cardiology. (2005); **32**: 563-566.
31. **S Kharche**, G Seemann, L Margetts, AV Holden, H Zhang. eScience simulation of clinical electrophysiology in 3D human atrium. UK e-science All Hands Meeting, 2006. Nottingham.
32. IJ Grimstead, **S Kharche**, H Zhang, NJ Avis, DW Walker. Viewing 0.3Tb Heart Simulation Data At Your Desk. EG UK Theory and Practice of Computer Graphics (2007), pp. 1–7. Ik Soo Lim, David Duce (Eds).
33. **Kharche, S;** Zhang, H, "Simulating the effects of atrial fibrillation induced electrical remodeling: A comprehensive simulation study," Conf Proc IEEE Eng Med Biol Soc. 2008; 2008:593-6
34. S Kharche, J Stott, P Law, H Zhang. Simulating the Effects of Atrial Fibrillation in Electrically Heterogeneous Human Atria: A Computer Modelling Study. Computers in Cardiology 2008.
35. Sanjay Kharche, Jian Yu, Ming Lei, Henggui Zhang. Contribution of Kinetically Distinct HCN Isoforms to Murine Pacemaking: A Computational Study. General Meeting of The Physiological Society, Dublin (2009).
36. Law P, Kharche S, Stott J, Zhang H. Effects of elevated Homocysteine hormone on electrical activity in the human atrium: A simulation study. Conf Proc IEEE Eng Med Biol Soc. 2009;1:3936-9.
37. S Kharche et al. Global Sensitivity Indexing in Biophysically Detailed Cardiac Cell Models: A High Performance Computing Application. Talk at the UK E-science All Hands Meeting. December 2009.
38. **S Kharche**, J Higham, M Lei, H Zhang. Functional Roles of Ionic Currents in a Membrane Delimited Mouse Sino-atrial Node Model. Computing in Cardiology 2010; 37:421−424.
39. P Law, **S Kharche,** J Higham, H Zhang. Anti-arrhythmic Effects of Atrial Specific IKur Block: A Simulation Study. Computing in Cardiology 2010;37:429−432.
40. Y Yuan, K Wang, **S Kharche,** H Zhang. Vulnerability to Re-entry Arising from LPC-Induced Alterations of Cardiac Sodium Current Kinetics: A Simulation Study. Computing in Cardiology 2011; 38:653-656.
41. **S Kharche**, IV Biktasheva, G Seemann, H Zhang, VN Biktashev. Cardioversion Using Feedback Stimuli in Human Atria. Computing in Cardiology 2012; 39:133-136.
42. **S Kharche,** Giulia Callisesi, T Stary, A Bracci, S Severi. Simulating the Effects of Serum Potassium on the ECG. Computing in Cardiology 2012; 39:225-228.

43. **S Kharche.** Low Energy Cardioversion Using Feedback Stimuli in Human Atria. Multiscale Modelling in Medicine and Biology: 3-5 Sept. 2012. Centre for Mathematical Medicine and Biology, University of Nottingham.
44. **S Kharche**, A Jackson, IV Biktasheva, VN Biktashev. Simulation of Low Energy Defibrillation Using a Novel Cardiac Simulation Environment, Beatbox. Digital Research 2012 Conference, Oxford.
45. **Kharche S**, Beling J, Biktasheva IV, Zhang H, Biktashev VN. Simulating cell apoptosis induced sinus node dysfunction. Conf Proc IEEE Eng Med Biol Soc. (2013). 2013: 6842-5.
46. **Kharche SR**, Biktasheva IV, Zhang H, Biktashev VN. Simulating the role of anisotropy in human atrial cardioversion. Conf Proc IEEE Eng Med Biol Soc. (2013). 2013: 6838-41.
47. **S Kharche**, E J Vigmond, M Colman, H Zhang. Ischemia alters sensitivity of action potential to the sodium-potassium pump. Computing in Cardiology (2014).
48. **S Kharche**, J Zhao, S Castro, M Colman, R Stevenson, J Jarvis, B Smail, H Zhang. Role of fiber orientation in atrial arrythmogenesis. Computing in Cardiology (2014).
49. M A Colman, **S Kharche,** H Zhang. Loss of Transverse T-tubules Promotes the Development of Ectopic Activity in Guinea-pig Ventricle. Computing in Cardiology (2014).

Abstracts publications

50. **S Kharche et al.** (2004) Synchronization and Bursting in a Simple Gravid Uterus. J Physiol **561P** PC16
51. **S Kharche,** H Zhang, AV Holden (2005) Action potential duration, conduction velocity restitution, and vulnerability to re-entry in a computational model of human failing heart tissue **J Physiol 567P PC12**
52. **S Kharche et al.** (2006). Gain of function in Kir2.1 and its effects on atrial fibrillation in homogeneous virtual human atrial tissue: a computer simulation study, Journal of Electrocardiology, Volume 39(4): Suppl. 1, pp. S83
53. **S Kharche et al.** (2006) Gain-of-function in Kir2.1 and its effects on atrial fibrillation in homogeneous virtual human atrial tissue: a computer simulation study Proc. Physiol. Soc. **3 PC39**
54. **S. Kharche**, J. Stott, M. R. Boyett, H. Zhang (2007) Pro-arrhythmogenic effects of Kir2.1 and KvLQT1 familial gene mutations in human atrium: a computational study**.** Proc. Life Sciences **PC146**
55. T. Tao, S. C. O'Neill, **S. Kharche**, H. Zhang (2007) Mechanism of Ca intracellular alternans produced by low depolarization - A study by a stochastic $[Ca^{2+}]_i$ handling model**.** Proc. Physiol. **Soc. 8 PC33**
56. **S. Kharche**, J. Stott, P. Law, H. Zhang, J. C. Hancox (2007). Computational evaluation of the effects of novel anionic currents on human atrial electrical behaviour Proc Physiol Soc **8 PC8**
57. **Sanjay Kharche,** Henggui Zhang, Laurent Sallé, Fabien Brette. (2007). Computational investigation of the adaptation of action potential duration by pacing rate in rat myocytes. J. Mol. Cell. Cardiol 42(6): pp S1-S2.
58. **S. Kharche**, J. Stott, P. Law, H. Dobrzynski, H. Zhang (2008). Effects of atrial fibrillation on electrically heterogeneous human atria: a computer modelling study Proc Physiol Soc 11 **C20**
59. **S. Kharche**, J. Yu, M. Lei, H. Zhang (2009) Contribution of Kinetically Distinct HCN Isoforms to Murine Pacemaking: A Computational Study Proc Physiol Soc 15, C16
60. P. R. Law, J. Stott, **S. Kharche**, H. Zhang (2009). Conduction Propagation Dysfunction with No Apparent Changes in Cellular Electrical Action Potentials in Human Atria: A Simulation Study. Proc Physiol Soc 15, PC11
61. **S. Kharche**, L. Ming, H. Zhang (2009). A Systems Biology Computational Comparison of Two Cardiac Pacemaker Cell Models Proc Physiol Soc 15, PC115.
62. **S. Kharche**, M. Lei, H. Zhang (2010) Functional Roles of Ionic Currents in A Membrane Delimited Mouse Sino-atrial Node Cell Model. Proc Physiol Soc 19, C99
63. P. Law, **S. Kharche**, H. Zhang. (2010) Anti-arrythmogenic Effects of Atrial Specific I_{Kur} Block: A Modelling Study. Proc Physiol Soc 19, PC14
64. G. Callisesi, **S. Kharche**, S. Severi. (2011) M Cells in Humans: Action Potential Modelling and Impact on APD Distribution in Cardiac Tissue. Proc Physiol Soc 23, PC140
65. **S. Kharche**, T. Burchell, C. E. Astles, H. Zhang (2011) Computer Simulation of Human Atrial Fibrillation due to S140G and V141M Mutations of the Kv7.1 Gene. Proc Physiol Soc 23, PC251

66. **S. Kharche**, I. V. Biktasheva, V. N. Biktashev (2012) Beatbox: A novel multi-function cardiac simulation environment. Proc Physiol Soc 27, PC26
67. **S. Kharche**, T. Stary, G. Callisesi, A. Bracci, S. Severi (2012) Correlating serum potassium levels to ECG: A simulation study. Proc Physiol Soc 27, PC27.
68. **S Kharche,** T Stary, IV Biktasheva, H Zhang, VN Biktashev. (2013) The Role of Fibre Orientation in Cardioversion of Chronic Atrial Fibrillation: A Simulation Study. *Proc 37th IUPS, PCA017*
69. **S Kharche et al.** (2013). Simulating Cell Apoptosis Induced Sinus Node Dysfunction. *Proc 37th IUPS, PCA018*
70. **S Kharche et al.** Effects of human atrial ionic remodelling by β-blocker therapy on mechanisms of AF: a computer simulation. (2013). *J Electrocardiology 46(4): e6.*
71. **S Kharche et al.** Computer Simulation of the Role of Fibre Orientation in Cardioversion of Chronic Atrial Fibrillation. (2013). *J Electrocardiology 46(4): e6-e7.*
72. **Kharche, S.R.** et al. Effects of human atrial ionic remodelling by β-blocker therapy on mechanisms of atrial fibrillation: a computer simulation. *Journal of Electrocardiology*, *46(4): e6.*
73. M A Colman, O V Aslanidi, **S R Kharche,** M R Boyett, H Zhang. The effect of AF-induced electrical remodelling on regional electrical heterogeneity and tissue vulnerability to atrial fibrillation – insights from modelling. (2013). *J Electrocardiology 46(4): e18.*
74. **S. R. Kharche**, J. Zhao, S. Castro, R. Stevenson, J. Jarvis, B. Smail, H. (2014) Zhang. Activation regulation by fiber orientation in the rabbit atria. *Proc Physiol Soc 31, PCA010*
75. E. Perez Alday, M. Coman, P. Langley, D. Giacopelli, **S. R. Kharche**, H. Zhang. New algorithm to diagnose atrial ectopic origin from 64 lead ECG - insights from 3D virtual human atria and torso. Proc Physiol Soc 31 (2014) PCA044
S. R. Kharche1, H. Dobrzynski1. Complexity of the human sinoatrial node: A computational investigation. Physiology 2016 (Dublin, Ireland) (2016) Proc Physiol Soc 37, PCA012.
S. R. Kharche1, M. Boyett1, H. Dobrzynski1. Computational modelling of the mouse sino-atrial node: Exit block due to apoptosis. Physiology 2015 (Cardiff, UK) (2015) Proc Physiol Soc 34, PC007.
Sanjay Kharche 1, C W McIntyre 1, 2. Computational assessment of arrhythmia potential in the heterogeneously perfused ventricle. European Heart Rhythm Association meeting, Vienna, 2017.
Ph.D. Thesis
76. S Kharche. Stefan Problems with Two Dimensional Linearised Perturbations in Their Boundary Geometry or Boundary Conditions. Ph.D. thesis at the University of Hull, Hull, UK (September 2000).