

Associate Professor Leo Cheng, PhD

Auckland Bioengineering Institute

The University of Auckland

Private Bag 92019

Auckland, NEW ZEALAND

Email: l.cheng@auckland.ac.nz

Web: <https://unidirectory.auckland.ac.nz/profile/lche027>

Phone: +64 9 3737599

Born on October 7, 1975 in Auckland, New Zealand



Scientific Career

- Since 2016 Associate Director of Research, Auckland Bioengineering Institute, University of Auckland, New Zealand
- Since 2014 Associate Professor, Auckland Bioengineering Institute, University of Auckland, New Zealand
- Since 2011 Research Assistant Professor, Department of Surgery, Vanderbilt University, Nashville, TN, USA.
- Since 2011 Human Participants Ethics Advisor, Auckland Bioengineering Institute, University of Auckland, New Zealand
- 2006 - 2013 Senior Research Fellow, Auckland Bioengineering Institute, University of Auckland, New Zealand
- 2002 - 2005 Research Fellow, Auckland Bioengineering Institute, University of Auckland, New Zealand
- 1997 - 2002 PhD (Bioengineering), University of Auckland, New Zealand
- 1994 - 1997 BE (Engineering Science), University of Auckland, New Zealand

Scholarships, Awards and Faculty Functions

- 2016 University of Auckland Research Excellence Award
- 2014 Fraunhofer-Bessel Research Award of the Alexander von Humboldt Foundation
- 2012 Executive Committee, International Electrogastrography Society
- 2011 Chair, Organising Committee, "2nd International Meeting on New Advances on Gastrointestinal Motility", Auckland, New Zealand
- Review Editor for *Frontiers in Computational Physiology and Medicine*
- Editorial Board Member, *Comprehensive Electrocardiology*, Springer
- 2007 Claude McCarthy Fellowship, NZ Vice-Chancellors Committee
- 2005 Visiting Fellowship at the University of Texas Medical Branch, Galveston, TX
- 2002 Finalist National Business Review Management Competition
- 2001 Jos Willems Young Investigator Finalist at the International Society Computerized Electrocardiology Conference, Hutchinson Island, FL
- 2000 Highly Commended Award at the Australian and New Zealand, Industrial and Applied Mathematics Conference, Waitangi, New Zealand

Ten most important publications

* Publications jointly together with UoA-researchers involved within this IRTG

§ Publications jointly together with USTUTT-researchers involved within this IRTG

A) Published in publication outlets with scientific quality assurance and book publications:

1. Cheng, L.K.; Bodley, J.M.; Pullan, A.J.: Comparison of potential- and activation-based formulations for the inverse problem of electrocardiology. IEEE Transactions on Biomedical Engineering, 50(1), p.11-22, 2003.
2. Cheng, L.K.; Komuro, R.; Austin, T.M.; Buist, M.L.; Pullan, A.J.: Anatomically realistic multiscale models of normal and abnormal gastrointestinal electrical activity. World J Gastroenterol.,13(9), p. 1378-83, 2007.
3. Du, P.; O'Grady, G.; Egbuji, J.U.; Lammers, W.J.; Budgett, D.; Nielsen, P.; Windsor, J.A.; Pullan, A.J.; Cheng, L.K.: High-resolution mapping of in vivo gastrointestinal slow wave activity using flexible printed circuit board electrodes: methodology and validation. Ann Biomed Eng., 37(4), p. 839-846, 2009.
4. Du, P.; O'Grady, G.; Cheng, L.K.; Pullan, A.J.: A multiscale model of the electrophysiological basis of the human electrogastrogram. Biophys J., 99(9), p. 2784-92, 2010.
5. O'Grady, G.; Angeli, T.R.; Du, P.; Lahr, C.; Lammers, W.J.; Windsor, J.A.; Abell, T.L.; Farrugia, G.; Pullan, A.J.; Cheng, L.K.: Abnormal initiation and conduction of slow-wave activity in gastroparesis, defined by high-resolution electrical mapping. Gastroenterology, 143(3), p. 589-598, 2012.
6. Cheng, L.K.; Du, P.; O'Grady, G.: Mapping and modeling gastrointestinal bioelectricity: from engineering bench to bedside. Physiology, 28(5), p. 310-307, 2013.
7. * Dirven, S.; Xu, W.; Cheng, L.K.: Sinusoidal Peristaltic Waves in Soft Actuator for Mimicry of Esophageal Swallowing. IEEE/ASME Transactions on Mechatronics, 20(3), p.1331-1337, 2014.
8. * Driven, S.; Chen, F.J.; Xu, W.L.; Cheng, L.K.: Design and characterization of a peristaltic actuator inspired by esophageal swallowing. IEEE/ASME Transactions on Mechatronics, 19(4), p. 1234-1242, 2014.
9. Pullan, A.J.; Cheng, L.K.; Buist, M.L.: Mathematically modeling the electrical activity of the heart: from cell to body surface and back again, Singapore: World Scientific Publishing Company, 425 pages, 2005.

B) Other publications

10. Cheng L.K.; Pullan A.J.; Farrugia, G. (Editors). New Advances in Gastrointestinal Motility Research. Lectures Notes in Computational Vision and Biomechanics. Springer Netherlands, 266 pages. 2013.

C) Patents

1. *§ Smith N.P.; Budgett D.M.; Hunter P.J.; Malcolm D.T.; Cheng L.K.; Nash M.P.; Nielsen P.M.F.; Pullan A.J.; Young A.A.; Röhrle, O.: "Biophysical virtual model database and application" Application No. PCT/IB2007/002246, dated August 4, 2007.
2. O'Grady, G.; Du P.; Cheng L.K.; Erickson, J.C.; Pullan A.J.: New Zealand Provisional Patent 599580 "System and Method for Mapping Gastro-Intestinal Electrical Activity". NZ Patent 579235 (5 Jun 2013). PCT Aug 2010.
3. O'Grady, G.; Cheng L.K.; Angeli T.R.; Du, P.; Pullan A.J.; Paskaranandavadivel N.; Farrugia, G.; Asirvatham, S.: "System and method for mapping gastric dysrhythmias", #61/394171; PCT, October 2011.

Supervised graduate students since graduation year 2011

No.	Last Name, First Name	Degree	Title of the dissertation	Duration of thesis
1	Du, Peng	PhD	Simulation of Gastric Electrical Activity	2009 - 2011
2	Paskaranandavadivel, Nirachan	PhD	Analysis and Interpretation of Gastrointestinal Slow Wave Activity	2010 - 2013
3	Angeli, Timothy	PhD	Mapping Slow Wave Activity of the Small Intestine	2009 - 2013
4	UIHaque, Muhammad	PhD	A model of the nerves in the diabetic foot	2010 - 2013
5	Lees-Green Rachel	PhD	Keeping Pace with Interstitial Cells of Cajal	2010 - 2013
6	Gao, Jerry	PhD	Structural and Functional Analysis of Interstitial Cells of Cajal Networks	2011 - 2014
7	Bear, Laura	PhD	Non-Invasive Analysis of Cardiac Electrophysiology through ECG	2010 - 2014
8	Berry, Rachel	PhD	Characterisation of Gastric Slow Wave Activity in Health and Disease	2012 - current
9	Sathar, Shameer	PhD	High Performance Computational Simulations of Gastric Electrical Activity.	2011- 2015
10	Dirven, Steven	PhD	Modelling, Sensing and Control of a Peristaltic Actuator Inspired by Esophageal Swallowing	2011 - 2014
11	Zhu, Mingzhu	PhD	Central Pattern Generator Based Involuntary Peristalsis Control of a Swallowing Device	2012 - current
12	Din, Abdul Sattar	PhD	Development of Deformable Sensation Elements and Closed-loop Control a Biomimetic Esophageal Swallowing Robot	2014 - current
13	Dang, Yu	PhD	Large deformation actuation and control	2015 - current
14	Hashem, Ryman	PhD	Biomimicry of human gastric motility soft-bodied robot	2015 - current
15	Aalighale, Saeed	PhD	New Foundations for Pacing the Stomach	2016 - current

Most important research grants since 2011

No.	Research Project	Funding Period	Name(s) of the principal investigator(s)	Funding source and reference number
1	Mapping, Modelling and Manipulating Gastric Electrical Activity	2009-2013	Pullan, A.	Health Research Council NZ (09/138)
2	Realistic Models of Gastrointestinal Bioelectromagnetism	2011-2016	Cheng, L.K.	NIH (R01 DK64775)
3	New Clinical Tools for Diagnosiing Gastric Dysfunction	2010-2014	Cheng, L.K.	Health Research Council NZ (10/157)
4	MuscleUp - Towards an Interface for Detailed Musculoskeletal Models	2010 - 2014	Röhrle, O. (Cheng, L.K. NZ-based PI)	FP7-PEOPLE-2009-IRSES. Project #246994
6	Techniques for Electrogastrography Analysis	2013-2014	Cheng, L.K.	Commercial
7	Mechanisms of Gastric dysmotility: Advances from Cell to Clinic	2014-2017	Cheng, L.K.	Health Research Council NZ (14/158)
8	Diagnosis and Therapy of Gastric Dysrhythmias	2015-2018	Cheng, L.K.	MedTech CoRE