

Curriculum vitae
CHNG, SHU SIN

Assistant Professor
National University of Singapore, Department of Chemistry
Center for Life Sciences, #03-02, Singapore 117456.
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PROFESSIONAL EXPERIENCE

- Apr 2012 – present **Visiting Assistant Professor**
Singapore Center for Environmental Life Sciences Engineering (SCELSE)
- Aug 2011 – present **Assistant Professor**
National University of Singapore (Chemistry)
- Jul 2010 – Jul 2011 **Postdoctoral Fellow**
Harvard Medical School (Microbiology and Molecular Genetics)
(Advisor: Professor Jonathan Beckwith)
- Jul 2000 – Jun 2004 **Research Assistant**
National University of Singapore (Chemistry)
(Advisor: Professor Teck Peng Loh)

EDUCATION

- Sept 2004 – May 2010 **Doctor of Philosophy (Ph.D.) degree in Chemistry**
Harvard University
(Advisor: Professor Daniel Kahne)
- Jul 2000 – Jun 2003 **Bachelor of Science (First Class Honors) degree in Chemistry**
National University of Singapore
(Advisor: Professor Teck Peng Loh)

MILITARY EXPERIENCE

- Jan 1999 – May 2000 Battalion Signal Officer (40th Singapore Armoured Regiment)
Jan 1998 – Jan 1999 Officer Cadet (Signals – awarded Sword of Honor *for best cadet*)

TEACHING EXPERIENCE

- Jan 2014 – present **CM3225 Biomolecules (NUS)**
Lecturer for AY13/14, 14/15, 15/16 and 16/17
- Jan 2013 – present **CM4227 Chemical Biology (NUS)**
Lecturer for AY12/13, 13/14, 14/15, 15/16 and 17/18
- Feb 2007 – Jun 2009 **Chemistry 270 – Chemical Biology (Harvard University)**
Graduate Head Teaching Fellow for Spring 2009
Graduate Teaching Fellow for Spring 2007
- Sept 2005 – Dec 2009 **Life Sciences 1A – An Integrated Introduction to the Life Sciences**
(Harvard University)
Course Assistant for Summer/Fall 2007 and Fall 2009
Graduate Teaching Fellow for Fall 2005, 2006 and 2007

- Feb 2005 – Jun 2006 **Chemistry 27 – Organic Chemistry of Life** (Harvard University)
 Graduate Head Teaching Fellow for Spring 2006
 Graduate Teaching Fellow for Spring 2005
- Jan 2003 – May 2003 **CM 1121 – Basic Organic Chemistry** (NUS)
 Undergraduate Laboratory Teaching Assistant
- Jan 2003 – May 2003 **Special Program in Science** (NUS)
 Student Mentor

AWARDS AND FELLOWSHIPS

- 2015 – 2016 NUS Annual Excellence Teaching Award 2013/14 and 2014/15
 2014 – 2016 NUS Faculty Excellence Teaching Award 2013/14, 2014/15 and 2015/16
 2014 Shortlisted for Singapore National Academy of Science (SNAS) Young Scientist Award 2014
- 2009 Christensen Prize *for outstanding research achievement*
 2005/6/7/9 Harvard University Certificate of Distinction in Teaching (four terms)
 2005 – 2006 Eli Lilly Organic Chemistry Fellowship Award
 2003 Singapore National Institute of Chemistry (SNIC) Gold Medal
 2002 – 2003 Agency for Science, Technology and Research (A*STAR) Pre-graduate Award
 2002 Glaxo Gold Medal
 2002 Merck Sharpe and Dohme (MSD) Gold Medal
 2001 Singapore National Institute of Chemistry (SNIC) Book Prize
 2000 – 2002 National University of Singapore Undergraduate Scholarship
 1997 29th International Chemistry Olympiad (Silver medal)

GRANTS AND FUNDING

- Oct 2017 MOE AcRF Tier 1 (Collaborative scheme: S\$84,200.00, 1.5 years)
 Jan 2017 MOE AcRF Tier 2 (MOE2016-T2-1-104: S\$937,972.50, 3 years)
 Feb 2015 NMRC CBRG (NMRC/CBRG/0072/2014: S\$1,200,000.00, 3 years)
 Oct 2014 MOE AcRF Tier 2 (MOE2014-T2-1-042: S\$891,236.00, 3 years)
 Oct 2013 MOE AcRF Tier 2 (MOE2013-T2-1-148: S\$885,944.50, 3 years)
 Feb 2013 MOE AcRF Tier 1 (S\$175,500.00, 3 years)
 Aug 2011 NUS Start-up funding (S\$760,000.00, 3 years)

INSTITUTION AND CONFERENCE TALKS

- Jul 2017 International Union of Microbiology Societies 2017 (workshop chair)
 May 2017 Department of Microbiology and Immunology, UCSF, USA
 May 2017 Division of Biological Sciences, UC San Diego, USA
 May 2017 Microbial Genetics and Genomics VII, Asilomar, California, USA
 Apr 2017 MRC Center for Molecular Bacteriology and Infection, Imperial College London, UK
 Apr 2017 Department of Biochemistry, University of Cambridge, UK
 Apr 2017 Institute of Microbiology and Infection, Birmingham University, UK
 Mar 2017 Center for Bacterial Cell Biology, Newcastle University, UK
 Mar 2017 Department of Biochemistry, University of Oxford, UK
 Mar 2017 Department of Microbiology, NUS, Singapore
 Feb 2017 i3 Institute, University Technology of Sydney, Sydney, Australia
 Feb 2017 Department of Microbiology, Monash University, Melbourne, Australia
 Feb 2017 42nd Lorne Conference on Protein Structure and Function, Lorne, Australia
 Jan 2017 4th International Conference on Cellular and Molecular Bioengineering, Singapore
 Nov 2016 SPRINT-TB 2nd Annual Symposium 2016, Singapore
 Oct 2016 Department of Biochemistry, NUS, Singapore
 Sept 2016 EMBO Tuberculosis 2016, Paris, France
 Sept 2016 Department of Microbiology, Pasteur Institute, Paris, France

Sept 2016 De Duve Institute, Catholic University of Louvain, Brussels, Belgium
 Jul 2016 Department of Microbiology and Immunobiology, Harvard Medical School, USA
 Dec 2015 6th International Singapore Lipid Symposium, NUS, Singapore
 Sep 2015 13th Molecular Analysis of Bacterial Pathogens Meeting, Melbourne, Australia
 May 2014 Department of Chemistry, Peking University, Beijing, China
 May 2014 Center for Infectious Disease, School of Medicine, Tsinghua University, Beijing, China
 Apr 2014 Microbial Genetics and Genomics VI, Paris, France
 Aug 2013 15th Asian Chemical Congress, Singapore
 Jul 2012 Singapore Center for Environmental Life Sciences Engineering (SCELSE), Singapore
 Mar 2012 4th International Singapore Lipid Symposium, NUS, Singapore
 Jan 2012 Infectious Disease IRG workshop, Singapore-MIT Alliance for Research and Technology (SMART), Singapore
 Jan 2012 Department of Microbiology, NUS, Singapore

LIST OF PUBLICATIONS

Publications arising from independent laboratory

Shrivastava R, Jiang XE, Chng SS[#] (2017) Outer membrane lipid homeostasis via retrograde phospholipid transport in *Escherichia coli*. *Mol Microbiol* (in press); preprint at *bioRxiv* doi: 10.1101/109884. ([#]corresponding author)

Isom G, Davies N, Chong ZS, Bryant J, Jamshad M, Sharif M, Cunningham A, Knowles T, Chng SS, Cole J, Henderson I (2017) MCE domain proteins: conserved inner membrane lipid-binding proteins required for outer membrane homeostasis. *Sci Rep* (in press); preprint at *bioRxiv* doi: 10.1101/159053.

Xu ZJ, Meshcheryakov VA, Poce G, Chng SS[#] (2017) MmpL3 is the flippase for mycolic acids in mycobacteria. *Proc Natl Acad Sci USA* 114:7993-7998; preprint at *bioRxiv* doi: 10.1101/099440. ([#]corresponding author)

Thong SH,* Ercan B,* Torta F, Fong ZY, Wong HYA, Wenk MR, Chng SS[#] (2016) Defining key roles for auxiliary proteins in an ABC transporter that maintains bacterial outer membrane lipid asymmetry. *eLife* 5:e19042. (*equal contribution; [#]corresponding author)

Chong ZS, Woo WF, Chng SS[#] (2015) Osmoporin OmpC forms a complex with MiaA to maintain outer membrane lipid asymmetry in *Escherichia coli*. *Mol Microbiol* 98:1133-1146. ([#]corresponding author)

Publications arising from postdoctoral research work

Chng SS, Dutton, RJ, Denoncin K, Vertommen D, Collet JF, Kadokura H, Beckwith J (2012) Overexpression of the rhodanese PspE, a single cysteine-containing protein, restores disulfide bond formation to an *Escherichia coli* strain lacking DsbA. *Mol Microbiol* 85:996-1006.

Publications arising from graduate research work

Chng SS,* Xue M,* Garner RA, Kadokura H, Boyd D, Beckwith J, Kahne D (2012) Disulfide rearrangement triggered by translocon assembly controls lipopolysaccharide export. *Science* 337:1665-1668. (*equal contribution)

Chimalakonda G, Ruiz N, Chng SS, Garner RA, Kahne D, Silhavy TJ (2011) Lipoprotein LptE is required for the assembly of LptD by the β -barrel assembly machine in the outer membrane of *Escherichia coli*. *Proc Natl Acad Sci USA* 108:2492-2497.

Freinkman E, Chng SS, Kahne D (2011) The complex that inserts lipopolysaccharide into the bacterial outer membrane forms a two-protein plug-and-barrel. *Proc Natl Acad Sci USA* 108:2486-2491.

Ruiz N, Chng SS, Hiniker A, Kahne D, Silhavy TJ (2010) Non-consecutive disulfide bond formation in an essential integral outer membrane protein. *Proc Natl Acad Sci USA* 107:12245-12250.

Chng SS,* Gronenberg LS,* Kahne D (2010) Proteins required for lipopolysaccharide assembly in *Escherichia coli* form a trans-envelope complex. *Biochemistry* 49:4565-4567. (*equal contribution)

Chng SS, Ruiz N, Chimalakonda G, Silhavy TJ, Kahne D (2010) Characterization of the two-protein complex in *Escherichia coli* responsible for lipopolysaccharide assembly at the outer membrane. *Proc Natl Acad Sci USA* 107:5363-5368.

Wu T, McCandlish AC, Gronenberg LS, Chng SS, Silhavy TJ, Kahne D (2006) Identification of a protein complex that assembles lipopolysaccharide in the outer membrane of *Escherichia coli*. *Proc Natl Acad Sci USA* 103:11754-11759.

Publications arising from undergraduate research work

Zhao YJ, Chng SS, Loh TP (2007) Lewis acid-promoted intermolecular acetal-initiated cationic polyene cyclizations. *J Am Chem Soc* 129:492-493.

Chng SS, Hoang TG, Lee WWW, Tham MP, Ling HY, Loh TP (2004) Synthetic Studies towards anti-SARS agents: application of an indium-mediated allylation of α -aminoaldehydes as the key step towards an intermediate. *Tetrahedron Lett* 45:9501-9504.

Tan KT, Chng SS, Cheng HS, Loh TP (2003) Development of a highly α -regioselective metal-mediated allylation reaction in aqueous media: new mechanistic proposal for the origin of α -homoallylic alcohols. *J Am Chem Soc* 125:2958-2963.

Chng SS, Xu J, Loh TP (2003) A divergent approach to apoptolidin and FD-891: asymmetric synthesis of a common intermediate. *Tetrahedron Lett* 44:4997-5000.