

# PHILIP STEVEN LOW, PHD

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Date of Birth: August 16<sup>th</sup> 1979. Birth Place: Vienna, Austria.  
Country of Citizenship: Canada.

## EDUCATION

- University of California, San Diego, La Jolla, CA, USA, 2001-2007:
- Ph.D in Computational Neurobiology
- Committee in charge: Charles F. Stevens (Chair), Terrence J. Sejnowski (advisor), Fred H. Gage (advisor), Sean P. A. Drummond, Larry R. Squire.
- The University of Chicago, Chicago, IL, USA, 1996-2000:
- Bachelors of Science in Pure Mathematics
- Institut Le Rosey, Rolle & Gstaad, Switzerland, 1991-1996:
- French Scientific Baccalaureate, specialization in Mathematics
- Cours Hattemer, Paris, France, 1984-1991

## EXPERIENCE

- NeuroVigil, Inc. La Jolla, CA, USA. Founder, CEO and CSO. 02/07 – current:
- Creating Non-invasive Real-time brain activity monitoring devices with predictive capability.
- Board of Advisors: Sonia Ancoli-Israel, Sydney Brenner, Fred Gage, Ronald Graham, Terrence Sejnowski, Jerome Siegel, Donald Spencer, Andrew Viterbi and Stephen Wolfram.
- Salk Institute for Biological Studies, La Jolla, CA, USA, 09/01– 10/07: Graduate Student & Sloan-Swartz Fellow in Computational Neurobiology.
- Devised SPEARS, the first single channel unsupervised human sleep EEG recognition algorithm.
- Hippocampal slice physiology in Gage Laboratory.
- Wrote video stimuli and developed brain maps for Macaque visual system
- The University of Chicago, Chicago, IL, USA, Margoliash Laboratory, Research Assistant, 06/00 - 08/01, 06/02-08/02
- Developed EEG experimental technique and equipment for the zebra finch, *Taeniopygia guttata*, in order to understand sleep in a species without a cortex.
- Harvard Medical School / Brigham and Women's Hospital & Children's Hospital Boston, Boston, MA, USA, Nowak Lab, Intern, 06-09/99
- Verified the potential of Compound H, a collagen type I inhibitor, against tumor cell proliferation, using immunostaining, Tritium assays and modeling.
- Designed a survey aimed at isolating behavioral factors relevant to fibroid and ovarian tumor genesis.

## PUBLICATIONS

"The Organization of Sleep States in Zebra Finches"

P Low, S Shank & D Margoliash. Computational Neuroscience 2003 Proceedings.

"A Pattern of Mammalian-like Features in Zebra Finch Sleep"

P Low, S Shank & D Margoliash. Society for Neuroscience 2003 Abstracts.

"An unbiased automated approach to single channel sleep scoring"

P Low, FH Gage & TJ Sejnowski. Society for Neuroscience 2004 Abstracts.

"The anti-fibrotic drug halofuginone inhibits proliferation and collagen production by leiomyoma smooth muscle cells."

RA Nowak, P Low, JE Wubben, RJ Belton, Jr. 2nd NIH Int. Congress on Advances in Uterine Leiomyoma Research. 2005.

"Dynamic Spectral Scoring: A New Way to Look at Sleep", P Low, FH Gage, & TJ Sejnowski. WiR Workshop on Data-driven Modelling and Computation in Neuroscience, Hohenwart Forum, Germany, May 2005.

"A New Way To Look At Sleep" PS Low, FH Gage & TJ Sejnowski. Society for Neuroscience 2005 Abstracts.

"Fine Structure of Human Sleep" PS Low & TJ Sejnowski. Society for Neuroscience 2006 Abstracts.

"REM revisited" PS Low & TJ Sejnowski. Society for Neuroscience 2007 Abstracts.

"The Antifibrotic Drug Halofuginone Inhibits Proliferation and Collagen Production by Human Leiomyoma and Myometrial Smooth Muscle Cells." MM Grudzien, PS Low, PC Manning, M Arredondo, RJ Belton, Jr & RA Nowak. *Fertil Steril*. 2009

"Mammalian-like Features of Sleep Structure in Zebra Finches" PS Low, SS Shank, TJ Sejnowski & D Margoliash. *Proceedings of the National Academy of Sciences USA* 2008 Jul 1;105(26):9081-6. Epub 2008 Jun 25.

"A New Way To Look At Sleep" PS Low, Ph.D thesis, UC San Diego, 2007

"Fine Structure of Human Sleep" PS Low & TJ Sejnowski. *In Review*

"REM Revealed" PS Low, SC Barton, R Landreth, TJ Sejnowski. Society for Neuroscience 2008 Abstracts.

"A non-Invasive EEG in Animals." M Bonjean, P Low, L Wylie, B Nielsen, TJ Sejnowski, FH Gage. Society for Neuroscience 2008 Abstracts.

## PATENTS

U.S. Provisional Patent Application Serial No. 60/679,951 filed May 10, 2005, entitled "Dynamic Signal Processing"

PCT Patent Application Serial No. US2005/027562 filed August 2, 2005, entitled "Dynamic Signal Processing"

U.S. Patent Application Serial No. 11/431,425 filed May 9, 2006, entitled "Automated Detection of Sleep and Waking States"

PCT Patent Application Serial No. US2006/018120 filed May 9, 2006, entitled "Automated Detection of Sleep and Waking States"

Several other Patent Applications are currently being processed regarding novel ways to record, identify and use brain activity.

## AWARDS

NSF-IGERT Fellowship (2001),

Merck Fellowship (2001),

Sloan-Swartz Fellowship (2002-2007).

Ray Thomas Edwards Award (2006).

Kavli Brain and Mind Award for Innovative Research (2007).  
Top Executive Summary Selection and Business Plan Competition Finalist, UCSD50K Triton Innovation Award Jury (2007).  
1<sup>st</sup> Prize, UCSD50K Entrepreneurship Competition. (2008).  
Winner: Draper Fisher Jurvetson, DFJ Frontier, and Zone Ventures Business Competition 250K winner-take-all Award (2008).

## PRESS

"The dream of the zebra finch" Biomednet, Elsevier Press. October 9th 2003.  
"To sleep, perchance to dream" Biomednet, Elsevier Press. October 12th 2003.  
"Sleeping with the Finches" The Economist. London. October 22<sup>nd</sup> 2003,  
Science & Technology, p. 79. "Song Learning and Sleep". Nature Neuroscience 2005 May;8(5):546-8.  
Who'sWho in America, 2007-8. Who'sWho in The World, 2008.  
"The Secrets of Sleep". MIT Technology Review. December 2006. Researcher's hub. E-newsletter. CONNECT. March 2007. "Memories Are Made Like This". Howard Hughes Medical Institute Bulletin. May 2007. Dispatches from the Frontiers of Science, Proto Mass General. Fall 2007.  
"Draper Fisher Jurvetson, DFJ Frontier, and Zone Ventures Award \$250,000 to NeuroVigil in Fourth Annual DFJ Venture Challenge", CNBC News, CBS News, Forbes, Market Watch, Business Wire, TED Feed, Yahoo Business, Yahoo Finance, MySpace News, Fox News, SocialTECH, Silicontap, Ecademy, tmcnet, Jordo Media, Technorati, Christine, Altavista, San Jose Mercury News, Finance Industry Today, Sleep Disorders News, MyFeedz.com, Pr-inside, EuroInvestor.co.uk, smartbrief.com, venturecapitalcentral.com, My Way Finance (Spring 2008).  
"NeuroVigil Inc., a Salk Institute spin off, Wins First Prize at World-Class UCSD \$50K Innovation Competition" Forbes, Business Wire, CNBC, Market Watch, Reuters, CBS, FDA News, Fox Business, Business Wire, Yahoo! Finance, BioSpace, TD Ameritrade, Wallstreet Online, Smart Brief, Markets, Denver Post, Chicago Board Options Exchange, StreetInsider.com, Digital 50, World News Network, EIN News, biz San Diego, Banks.com, TradingMarkets.com, encyclopedia.com, Centre Daily Times, The Earth Times, San Diego Source Daily Transcript, eMedia World, Portofolio.com, INIT AKTIE (German), Finanz Nachrichten, Breitbart, Newstin, direktbroker.de, Clinica Space (Spring 2008).  
"In Sleep, We Are Birds of a Feather", The New York Times & International Herald Tribune July 1st 2008 as well as Discovery News, Scienceblogs.com, Yahoo! News, Biological Psychology, Newstrack india, Salk Institute, The Columbus Dispatch, SLEEPzine, University of New Mexico, dispatch.com, treasure.1x1y.com.cn, Brasil Imprensa Libre (Portuguese), Ultimo Segundo (Portuguese), Thaindian News, Webindia 123, Sunday Express, BIRDS.com, goo.ne.jp (Japanese), Newstin (Spanish).  
"Secret Sleep of Birds Revealed in Brain Scans", The New Scientist, July 2<sup>nd</sup> 2008.  
"Bird Brains Key to the Functions of Sleep." Science. 2008 Dec 19;322(5909):1789.

## TEACHING / MENTORING / TRAINING

Experiments: S. Shank (avian EEG preparation, University of Chicago), M. Bonjean, R. Landreth, L. Wylie (new rodent EEG preparation, Salk Institute) Analysis: H. Mien, I. Spokoyny, L. Schuetz, H. Schuetz (EEG analysis, Salk Institute), S. Barton, R. Landreth, (EEG analysis, NeuroVigil), K. Lui, P. Ng, J. Jou (Data Acquisition devices, NeuroVigil).  
BGGN 246 B: Designed and taught graduate Advanced Biology of Sleep Oscillations. Spring 2006.

## TALKS

Sloan-Swartz talk, Salk Institute, San Diego, CA, USA. February 2002.  
Institute for Neural Computation, UCSD, San Diego, CA, USA. February 2003.  
Sleep & Chronobiology, UCSD, San Diego, CA, USA. February 2003.  
Neurophysics Laboratory, UCSD, San Diego, CA, USA. February 2003.  
Society for Neuroscience, New Orleans, LA, USA. October 2003.  
Institute for Nonlinear Dynamics, UCSD, San Diego, CA, USA. May 2004.  
Merck Symposium, UCSD, San Diego, CA, USA. June 2004.  
Society of Research Fellows, Salk Institute, San Diego, CA, USA. October 2004.  
Invited Talk, Data Driven Modelling and Simulation in Computational Neuroscience, Hohenwart Forum, Germany. May 2005.  
Invited Talk, Max-Planck Institute for Psychiatry, Munich, Germany. May 2005.  
Sloan-Swartz Annual Symposium, California Institute of Technology (Caltech), Pasadena, CA, USA. July 2005.  
Swartz Center for Computational Neuroscience, UCSD, San Diego, CA, USA. November 2005.  
Sleep & Chronobiology, UCSD, San Diego, CA, USA. April 2006.  
UCSD Rady School of Management, Salk Institute, San Diego, CA, USA. April 2006.  
Invited Talk, Redwood Center for Theoretical Neuroscience, UC Berkeley, Berkeley, CA, USA. June 2006.  
Invited Talk, Sleep Grand Rounds, Stanford University, Palo Alto, CA, USA. June 2006.  
Invited Talk, Keck Center for Integrative Neuroscience, UCSF, San Francisco, CA, USA. June 2006.  
Sloan-Swartz Annual Symposium, Columbia University, New York, NY, USA July 2006.  
Society for Neuroscience, Atlanta, GA, USA. October 2006.  
Waking Up To Sleep, The Science Network, The Salk Institute, San Diego, CA, USA. February 2007.  
UCSD50K Triton Innovation Award Finalist, San Diego, CA, USA. June 2007.  
Aspen Consciousness Research Retreat, Aspen, CO, USA. August 2007.  
Almaden Research Center, IBM, San Jose, CA, USA. September 2007.  
Invited Talk, Scripps Clinic Sleep Center, La Jolla, CA, USA, October 2007.  
Thesis Defense: "A New Way To Look At Sleep: *Separation & Convergence*".  
Salk Institute, La Jolla, CA, USA. October 2007.  
Society for Neuroscience, San Diego, CA, USA. November 2007.  
Wellcome Trust Centre for Human Genetics, University of Oxford, Oxford, United Kingdom. December 2007.  
Invited Talk, Max-Planck Institute for Psychiatry, Munich, Germany. December 2007.  
Novartis Pharmaceuticals, Basel, Switzerland. December 2007.  
Hoffmann - La Roche, Basel, Switzerland. December 2007.  
California Institute of Technology (Caltech), Pasadena, CA, USA. January 2008.  
McGovern Institute, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA. April 2008.  
Rady Business School, UCSD, San Diego, CA. April 2008.  
Kavli Institute for Brain & Mind Symposium, UCSD, San Diego, CA, USA. May 2008.  
Fourth Annual DFJ Venture Challenge, Menlo Park, CA, USA. May 2008.  
UCSD50K Triton Innovation Award Final, San Diego, CA, USA. May 2008.  
Keynote Address, IN3 Medical Summit, San Francisco, CA. June 2008  
Aspen Consciousness Research Retreat, Aspen, CO, USA. July 2008.  
Qualcomm, San Diego, CA, USA. August 2008.  
Novartis Pharmaceuticals, Basel, Switzerland. August 2008.  
Johnson & Johnson, Skillman, NJ. September 2008.  
Massachusetts General Hospital, Harvard Medical School, Boston, MA USA. September 2008.  
Media Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA. September 2008.  
Neuroventures lecture, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA. September 2008.  
Qualcomm, San Diego, CA, USA. October 2008.  
Society for Neuroscience, Washington DC, USA. November 2008.  
Hoffmann - La Roche, Basel, Switzerland. December 2008 & January 2009.

## ACTIVITIES

American Association for the Advancement of Science (AAAS): Member, 2004-current.

AMPA (Association Medicale Pour L' Alzheimer's): Founding Member, 2009-current.

Computational Neuroscience (CNS): Board of Directors, Travel Grant & Future Meeting Sites committees. 2003-2005.

Institut Le Rosey: Chess Club founder and president 1991-96; Debate Club co-founder and co-president 1994-1996;

Cultural Academy Vice-President, 1995-6; Students' UN member, 1993-1996; Ski and Tennis teams member, 1991-1996.

Mathematical Association of America (MAA): Member, 1997-current.

President of the Scientific Committee for the World Congress for Alzheimer's in Monaco, 2010.

Society for Neuroscience (SfN): Member, 2001-current.

The Science Network (TSN): Special Projects Advisor, 2003-current.

The University of Chicago: Chess Club co-president, 1999-2001; French Club President, 2000-2001.

UCSD / SALK: Neuroscience Journal Club organizer, 2001; Computational Neurobiology Journal Club member, 2001-current; Synaptic Physiology Journal Club member; Computational Neurobiology Lounge founder, 2001; Sloan-Swartz ChalkTalks organizer, 2002. Society of Research Fellows, 2002-present.

## MISCELLANEOUS

Fluent in French, English and German. Working knowledge of Italian, Russian. Proficiency with Microsoft and Linux OS, MS PowerPoint, Final Cut Pro, Media Cleaner Pro, Nodus, Matlab.