

CURRICULUM VITAE

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Education

University of Chicago, Chicago, IL	B.A.	1976	Biology
University of California, Berkeley, CA	Ph.D.	1983	Biophysics
Brandeis University/Harvard Medical School	Postdoc	1983-1987	Structural Biology

PhD Thesis: Structural and Physiological Studies on the Crystalline Membrane Particles in the Yeast *Saccharomyces cerevisiae*

Honors

Presidential Scholar 1979 Electron Microscopy Society of America.
National Institute of Health, Systems and Integrative Biology Traineeship, July 1977 through June 1980.
Charles A. King Trust Fellow, The Medical Foundation of Boston, 1987-1989.
Guest Scientist STEM facility Brookhaven National Laboratory 1987-present.
Invited Speaker Gordon Conference Three-Dimensional Electron Microscopy 1989.
Invited Speaker American Crystallographic Association 1992.
Invited Speaker Electron Microscopy Society of America 1992.
Session Chair, Gordon Conference on Three-Dimensional Electron Microscopy 1993, 1999, 2003
Invited Speaker International Meeting on Gap Junctions, Hiroshima, Japan, 1993.
Invited Speaker IBC Conference on Organoelectronic Materials Marina Del Rey, CA 1996.
National Science Foundation Career Advancement Award for Women Scientists and Engineers, July 1996
Session Chair Microscopy Society of America, August 1997, July 1998, August 1999, August 2000
Head Biological Tutorials for Microscopy Society of America (Education Committee, 2000-2002)
Session Chair, Structure Session International Gap Junction Meeting 2001
Guest Associate Editor, Cell Communication and Adhesion, Special Issue on Gap Junctions 2001
Invited Tutorial Speaker, Microscopy Society of America Annual Meeting, 2002
Invited Discussion Leader, Japan Electron Optics Laboratory President's Luncheon, 2003
Program Committee, 3rd International Congress on Electron Tomography
Additional Training: 1st American School for the Crystallization of Membrane Proteins, 1985

Research and/or Professional Experience

07/01-present	Adjunct Professor, Dept. of Neurosciences, University of California San Diego (UCSD)
10/96-present	Senior Researcher (adjunct position) San Diego Supercomputer Center
5/02; 8/02; 9/03	Grant review for Molecular and Cellular Biology Program, National Science Foundation.
10/99,3/00,3/01	NIH <i>ad hoc</i> reviewer for GMS and NCRR, respectively
09/99	Burroughs-Wellcome <i>ad hoc</i> reviewer for Joint Infrastructure grant
10/96, 04/99	NSF <i>ad hoc</i> reviewer for Molecular and Cell Biology special grant review
06/98	NIH <i>ad hoc</i> reviewer for Biophysics and Biophysical Chemistry special grant review

04/98 NSF *ad hoc* reviewer for Molecular and Cell Biology special grant review
02/98 NIH *ad hoc* reviewer for Biophysics and Biophysical Chemistry Study Section
06/99-present Sitting member of Chancellor's Committee on the Status of Women, UCSD
06/96-present Co-chair, Women in Science Committee, UCSD
11/95-present Women in Science Committee, UCSD
09/95-06/97 Lecturer, Dept. of Biology, Univ. of CA, San Diego, La Jolla, CA
07/95-present Computational Biology Town Meeting Committee, San Diego Super Computer Center

07/95-07/98 Head, Biology Electron Microscope Laboratory, UCSD
07/95- 07/98 Associate Research Scientist, Dept. of Biology (joint appointment), UCSD
07/95-06/01 Associate Research Neuroscientist (*Associate Research Professor*), Dept. of Neurosciences

04/95-06/95 Visiting Scholar, Dept. of Neurosciences, Univ. of CA, San Diego, La Jolla, CA
11/93 NIH *ad hoc* reviewer for special grant review
06/89-06/95 Senior Research Associate, Rosenstiel Center, Brandeis Univ., Waltham, MA
01/87-06/89 Research Associate, Rosenstiel Center, Brandeis Univ., Waltham, MA
05/83-12/86 Postdoctoral Fellow (joint appointment), Harvard Medical School, Dept. of Anatomy, Cambridge, MA and Rosenstiel Center, Brandeis Univ., Waltham, MA

07/80-1983 Research Assistant in the Biomed division of Lawrence Berkeley, Laboratory
06/79-09/79 Research Assistant associated with the Dept. of Biophysics, Univ. of CA

Journals for which I have served as a reviewer

Biophysical Journal, PNAS, Journal of the Microscopy Society of America, J. Molecular Biology
 J. Structural Biology, J. Histochemistry and Cytochemistry, J. Cell Science, J. Neuroscience
 Biochemistry, Hepatology, Microscopy Research and Technique, Micron

Professional Memberships

American Association for the Advancement of Science
 Biophysical Society
 Electron Microscopy Society of America

History of Grant Support

National Institutes of Health R01 Research Grant, Structural Studies of Split and Intact Gap Junctions, August 1, 1992- June 30, 1996.
 National Science Foundation Career Advancement Award for Women Scientists and Engineers Cellular Imaging of Gap Junctions, July 1996-June 1997.
 National Science Foundation (through San Diego Supercomputer Center), Electron Microscopy Outreach Program; Sept. 1, 1996 - August 30, 1997.
 Teaching Grant from UCSD Undergraduate Instruction Improvement Program Animations of Molecules for Structural Biochemistry
 National Science Foundation Molecular and Cellular Structure of Gap Junctions, May 1, 1998-April 30, 2005 (renewed April 2001)
 National Institutes of Health, IVEM and Image Analysis Resource Co-PI, April 1, 1999 - March 30, 2004
 National Institutes of Health, Shared Instrumentation Grant Cryo-Electron Microscopy Accessories for the JEOL 2000 Leading Principal Investigator. April 1, 2000 - March 30, 2001
 National Institutes of Health, Dynamics of Membrane Organization at the Nodes of Ranvier Co-PI, July, 2001 – Dec. 2006
 National Institutes of Health, Shared Instrumentation Grant High Pressure Freezer for Electron Microscopy Applications Leading Principal Investigator. March 1, 2002-February 28, 2003.
 National Institutes of Health RO1 Research Grant Structure and Dynamics of Connexin26 Gap Junctions PI, Aug 2003-July 2006.

Teaching Experience

UCSD:

Introduction to Light and Electron Microscopy (Neu299) UCSD Spring 1995, Spring 1997, Spring 1999, Spring 2002, Spring 2004
Structural Biochemistry (BIBC 100) UCSD Fall 1995, Fall 1996, Spring 1998
Multicellular Life (BILD 2) UCSD Spring 1996, Winter 1997

Web Sites:

Director, 3dem web site and community mailing list (see <http://3dem.ucsd.edu>)
Director, EM-outreach Program (see <http://em-outreach.ucsd.edu>)

Publications

- Baker, T.S., **Sosinsky, G.E.**, Caspar, D.L.D., Gall, C. and Goodenough, D.A. (1985) Gap junction structures. VII. Analysis of connexon images obtained with cationic and anionic negative stains. *J. Mol. Biol.* **184**, 81-98.
- Sosinsky, G.E.**, Schekman, R. and Glaeser, R.M. (1986) Morphological observations on the formation and stability of the crystalline arrays in the yeast plasma membrane. *J. Ultrastruc. Res.* **94**, 37-51.
- Caspar, D.L.D., **Sosinsky, G.E.**, Tibbitts, T.T., Phillips, W.C. and Goodenough, D.A. (1988) Gap junction structure. In *Modern Cell Biology*, Vol. 7, Gap Junctions (Hertzberg, E.L. and Johnson, R.G., eds.), pp. 117-133, Alan R. Liss, Inc., New York.
- Sosinsky, G.**, Jesior, J.C., Caspar, D.L.D. and Goodenough, D.A. (1988) Gap junction structures. VIII. Membrane cross-sections. *Biophys. J.* **53**, 709-722.
- Stallmeyer, M.J.B. Hahnenberger, K.M., **Sosinsky, G.E.**, Shapiro, L. and DeRosier, D.J. (1989) Image reconstruction of the flagellar basal body of *Caulobacter crescentus*. *J. Mol. Biol.* **205**, 511-518.
- Sosinsky, G.E.**, Baker, T.S., Caspar, D.L.D. and Goodenough, D.A. (1990) Correlation analysis of gap junction lattice images. *Biophys. J.* **58**, 1213-1226.
- *Cabral-Lilly, D., Phillips, G.N., Jr., **Sosinsky, G.E.**, Melanson, L., Chacko, S. and Cohen, C. (1991) Structural studies of tropomyosin by cryoelectron microscopy and X-ray diffraction. *Biophys. J.* **59**, 805-814.
- ***Sosinsky, G.E.**, Francis, N.R., Stallmeyer, M.J.B. and DeRosier, D.J. (1992) Substructure of the flagellar Basal body of *Salmonella typhimurium*. *J. Mol. Biol.* **223**, 171-184.
- Sosinsky, G.E.**, Francis, N.R., DeRosier, D.J., Wall, J.S., Simon, M.N. and Hainfeld, J. (1992) Mass determination and estimation of subunit stoichiometry of the bacterial hook-basal body flagellar complex of *Salmonella typhimurium* by scanning transmission electron microscopy. *Proc. Natl. Acad. Sci., USA* **89**, 4801-4805.
- Hoh, J.H., **Sosinsky, G.E.**, Revel, J.-P. and Hansma, P.K. (1993) Structure of the extracellular surface of the gap junction by atomic force microscopy. *Biophys. J.* **65**, 149-163.
- Francis, N.R., **Sosinsky, G.E.**, Thomas, D. and DeRosier, D.J.D. (1994) Isolation, characterization and structure of bacterial flagellar motors containing the switch complex, *J. Mol. Biol.* **235**, 1261-1270.
- Cabral-Lilly, D., **Sosinsky, G.E.**, Reed, R., McDermott, M.R. and Shipley, G.G. (1994) Orientation of cholera toxin bound to model membranes *Biophys. J.*, **66**, 935-941.
- Sosinsky, G.E.** (1995) Deducing connexin stoichiometry in isolated liver gap junction plaques from images obtained with scanning transmission electron microscopy in *Progress in Cell Research*, 4, 145-148, Y. Kanno et al., Eds. Elsevier, Amsterdam.
- Sosinsky, G.E.** (1995) Mixing of connexins in gap junction membrane channels, *Proc. Natl. Acad. Sci., USA*, **92**, 9210-9214.
- Ghoshroy, S., Goodenough, D.A., and **Sosinsky, G.E.** (1995) The structure of half gap junctional layers split with urea and EGTA, *J. Membrane Biol.*, **146**, 15-28.

- Perkins, G., Goodenough, D.A. and **Sosinsky, G.** (1997) The three-dimensional structure of the gap junction connexon, *Biophys. J.* **72**, 533-544.
- *Perkins, G.A. Goodenough, D.A. and **Sosinsky, G.E.** (1998) Formation of the gap junction intercellular channel requires a 30° rotation for interdigitating two apposing connexons *J. Mol. Biol.* **227**, 171-177.
- Perkins, G.A. Goodenough, D.A. and **Sosinsky, G.E.** (1998) Structural considerations for connexon docking in *Gap Junctions*, R. Werner, Ed., IOS Press, 13-17
- Sosinsky, G.E.**, Baker, T.S., Hand, G. and Ellisman, M.H. (1999) The Electron Microscopy Outreach Program: A Web Based Resource for Research and Education *J. Struc. Biol.* **125**, 246-252.
- Sosinsky, G. E. & Perkins, G. A. (2001). Purification of gap junctions. In *Methods Mol Biol*, Vol. 154, pp. 57-75.
- Sosinsky, G.E.**, and Perkins, G.A. (2000). Electron crystallographic methods for investigating gap junction structure. *Methods.* **20**, 140-155.
- Hand, G.M., Martone, M.E., Stelljes, A., Ellisman, M.E., and **Sosinsky, G.E.** (2000) Specific labeling of connexin43 in NRK cells using tyramide-based signal amplification and fluorescence photooxidation. *Microsc. Res. Tech.*, **52**:331-343.
- Hand, G.M., Müller, D.J., Nicholson, B., Engel, A and **Sosinsky, G.E.** (2002) Isolation and characterization of gap junctions from tissue culture cells *J. Mol. Biol.* **315**: 587-599.
- Müller, D.J., Hand G.M., Engel, A. and **Sosinsky, G.E.** (2002) Conformational changes in surface structures of isolated connexin26 gap junctions *EMBO J* **21**: 3598-3607.
- Martone, M.E., Gupta A., Wong, M., Qian, X., **Sosinsky, G.E.**, Ludaescher, B. and Ellisman M.H. (2002) A cell centered database for electron tomographic data *J. Struct. Biol* **138**: 145-155.
- Gaietta, G., Deerinck T.J., Adams S.R., Bouwer, J., Tour, O., Laird, D.W., **Sosinsky, G.E.**, Tsien, R.Y. and Ellisman, M.H. (2002) Multicolor and electron microscopic imaging of connexin trafficking, *Science*, **296**:503-7
- Sosinsky, G.E.**, Gaietta, G.M., Hand, G., Deerinck, T.J., Han, A., Mackey, M., Adams, S.R., Bouwer, J., Tsien, R.Y. and Ellisman, M.H., (2003) Tetracycline Genetic Tags Complexed with Biarsenical Ligands as a Tool for Investigating Gap Junction Structure and Dynamics. *Cell Comm. Adhes.* **10**:181-6.

Reviews

- Sosinsky, G.E.** (1992) Image analysis of gap junction structures. In *Electron Microscopy Reviews. Subcellular and Biomolecular Structure* (Harris, J.R., Horne, R.W. and Chiu, W., eds.) **5**, 59-76, Pergamon Press, New York.
- Sosinsky, G.E.** (1992) Order and disorder in gap junction lattices. In *Transactions of the American Crystallographic Association, Electron Crystallography*, **28**, 165-174.
- ***Sosinsky, G.E.** (1996) Molecular organization of gap junction membrane channels, *J. Bioener. and Biomem.* **28**, 297-308.
- ***Sosinsky, G.E.** (1996) Introduction to special issue on gap junctions, *J. Bioener. and Biomem.* **28**, 295-296.
- Sosinsky, G.** (2000) Gap Junction Structure: New Structures, New Insights in *Gap Junctions - The molecular basis of cell communication in health and disease*, C. Peracchia, ed. Academic Press, **v49**, 1-22.

Magazine Articles

- ***Sosinsky, G.** and Martone, M. (2003) The nuts and bolts of electron tomography: Imaging of big and messy biological structures *Microscopy Today, July/Aug issue 2003*

Abstracts

- Sosinsky, G.E.** (1979) Disappearance of the two dimensional crystalline patches on the yeast plasma membrane during lag and early log phase. Proceedings of the 37th Annual Meeting of the Electron Microscopy Society of America, Claitor's Publishing Division, Baton Rouge, LA.

- Sosinsky, G.**, Schekman, R. and Glaeser, R. (1980) Enlarged crystalline patches on the plasma membrane of yeast protoplasts. Proceedings of the 38th Annual Meeting of the Electron Microscopy Society of America, Claitor's Publishing Division, Baton Rouge, LA, pp. 686-687.
- Sosinsky, G.E.** and Glaeser, R.M. (1982) Isolation of the crystalline arrays in the yeast plasma membrane. Proceedings of the 40th Annual Meeting of the Electron Microscopy Society of America, Claitor's Publishing Division, Baton Rouge, LA.
- Sosinsky, G.**, Caspar, D.L.D., Baker, T.S., Makowski, L., Maulik, S., Phillips, W. and Goodenough, D. (1985) Analysis of gap junction electron micrographs based on a three-dimensional model. *Biophys. J.* 49, 204a.
- Sosinsky, G.E.**, Francis, N.R., Stallmeyer, M.J.B. and DeRosier, D.J. (1988) New structural features in the basal body of the bacterial flagellum revealed by low dose microscopy and image enhancement. *Biophys. J.* 53, 417a.
- Sosinsky, G.E.**, Baker, T.S., Caspar, D.L.D. and Goodenough, D.A. (1988) Correlation analysis of gap junction images. *Biophys. J.* 53, 635a.
- Cabral-Lilly, D., Phillips, G.N., Jr., **Sosinsky, G.**, Melanson, L.A. and Cohen, C. (1989) Structural studies of the tropomyosin/troponin switch by cryoelectron microscopy and X-ray diffraction. *Biophys. J.* 55, 201a.
- Francis, N.R., **Sosinsky, G.E.**, Stallmeyer, M.J.B. and DeRosier, D.J. (1989) Cryoelectron microscopy and image averaging of bacterial flagellar basal body. *Biophys. J.* 55, 417a.
- Sosinsky, G.E.**, Francis, N.R., DeRosier, C.D., DeRosier, D.J., Hainfeld, J. and Wall, J. (1990) The structure and subunit organization of the bacterial flagellar motor by scanning transmission electron microscopy and cryoelectron microscopy. Proceedings of the XIIth International Congress Electron Microscopy, pp. 278-279, San Francisco Press, Inc., California.
- Cabral-Lilly, D., Reed, R.A., **Sosinsky, G.E.** and Shipley, G.G. (1992) Cholera toxin Binding at the membrane surface. *Biophys. J.* 61, 86a.
- Thomas, D., Francis, N., **Sosinsky, G.** and DeRosier, D. (1992) Cryo-electron Microscopy of the Flagellar Rotary Motor in Vitreous Ice. *Biophys. J.* 61, 29a.
- Sosinsky, G.E.**, (1992) Diversity in Gap Junction Structures Proceedings of the 50th Annual Meeting of the Electron Microscopy Society of America, pp. 442-443, San Francisco Press, Inc. California
- Francis, N.R., **Sosinsky, G.E.**, Thomas, D., and DeRosier, D. (1992) Three-Dimensional Reconstruction of the Bacterial Basal Body/Switch Complex by Electron Cryomicroscopy Proceedings of the 50th Annual Meeting of the Electron Microscopy Society of America, pp. 514-515, San Francisco Press, Inc. California
- Sosinsky, G.E.** (1993) Evidence for Heterotypic Junctions from Scanning Transmission Electron Microscopy, American Society for Cell Biology.
- Perkins, G.A., Ghoshroy, S., Goodenough, D.A. and **Sosinsky, G.E.** (1996) Three dimensional structure of the gap junction hemichannel. *Biophys. J.* 70, A32.
- Perkins, G., Goodenough, D.A. and **Sosinsky, G.** (1997) Three dimensional structure of the gap junction connexon and intercellular channel, Microscopy Society of America, 3(2), 227-228.
- Sosinsky, G.** and Ellisman, M. (1997) Computational advances and enabling technologies for 3D microscopies in biology *Microscopy and Microanalysis* 3(2), 1135-1136.
- Sosinsky, G.**, Martone, M., Hand, G., Musil, L. and Ellisman, M. (1998) Correlative confocal and electron microscopy of the connexin43 gap junction protein in NRK cells: Balancing fixation conditions, cell permeabilization, antigen-antibody interaction and cell ultrastructure. *Microscopy and Microanalysis* 4(2), 1135-1136.
- Moisan, T.A., Ellisman, M. and **Sosinsky, G.** (1999) Chloroplast ultrastructure and absorption properties of the alga *Phaeocystis antarctica* Karsten: A qualitative study *Microscopy and Microanalysis*. 5(2) 1258-1259.

- Stuiver, I and **Sosinsky, G.** (1999) Functional and Conformational Changes Induced by Divalent Cations in Integrin $\alpha_v\beta_3$ *Mol. Cell Biol.* 10S:72.
- Sosinsky, G.**, Deerinck, T., Greco, R. and Ellisman, M. (2000) Three-dimensional reconstruction of a node of Ranvier obtained by serial section electron tomography *Microsc. Microanal.* **6**: 866-887.
- Hand, G., Nguyen, V., Downing, K., Müller, D., Engel, A. Nicholson, B. and Sosinsky, G. (2000) Isolation and Characterization of Connexin26 Gap Junctions from Transfected HeLa Cells *Microsc. Microanal.* **6**: 246-247.
- Sosinsky, G.**, Deerinck, T., Greco, R. and Ellisman, M. (2000) Node of Ranvier supramolecular detail revealed by serial section electron tomography Society for Neuroscience meeting.
- Sosinsky, G.**, Deerinck, T., Greco, R. and Ellisman, M. (2000) Three-dimensional reconstruction of a node of Ranvier obtained by serial section electron tomography *Microsc. Microanal.* **(6)2**: 866-867.
- Sosinsky, G.**, Hand, G.M., Gaietta, G., Deerinck, T., Martone, M., Adams, S., Stelljes, A., Jordan, K., Laird, D., Tsien, R. and Ellisman, M. (2001) Three-dimensional cellular organization of gap junction connexins revealed by specific labeling and electron tomography *Microsc. Microanal.* **7(2)**:80-81.
- Moisan, T.A., Ellisman, M.E. and **Sosinsky, G.E.** 2001. Chloroplast Ultrastructure of the Alga *Phaeocystis antarctica* Karsten: A New Structural Model Using Electron Tomography. International Congress on Photosynthesis, Brisbane, Australia, August 2001.
- Müller, D.J., Hand G.M., Engel, A. and **Sosinsky, G.E.** (2002) Conformational dynamics in connexon structure at molecular resolution using coordinated atomic force (AFM) and electron microscopy (EM) *Biophys. J.*
- Sosinsky, G.** (2002) The nuts and bolts of electron tomography: Imaging of big and messy biological structures *Microsc. Microanal.* 8(suppl. 2).
- Sosinsky, G.**, Deerinck, T., Bartol, T., Buitenhuys, C. Ellisman, M. (2002) Three-dimensional reconstruction of the node of Ranvier: Structure and use in modeling of ionic transmission. *Mol. Biol. Cell*
- Beahm, D. L., G. G. Gaietta, et al. (2004). A closed gap junction channel state caused by a single site mutation in the 3rd transmembrane helix. *Microscopy and Microanalysis* **in press**.

* indicates covers

Cover illustration also used for Trends in Cell Biology (1998) vol 8. Number 12.