

BIOGRAPHICAL SKETCH

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NAME Thomas P. Sakmar	POSITION TITLE Richard M. & Isabel P. Furlaud Professor		
eRA COMMONS USER NAME Sakmar			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Chicago, Chicago, IL	A.B.	1978	Chemistry
University of Chicago, Chicago, IL	M.D.	1982	Medicine
Massachusetts General Hospital, Boston, MA	Residency	1982-85	Internal Medicine
Massachusetts Inst. of Tech., Cambridge, MA	Postdoc.	1985-90	Molecular Biology

A. Positions and Honors.**Positions**

1982 - 1983 Intern in Medicine, Massachusetts General Hospital, Boston, MA
 1983 - 1985 Resident in Medicine, Massachusetts General Hospital, Boston, MA
 1982 - 1985 Clinical Fellow in Medicine (J. T. Potts, Jr., Chairman), Harvard Medical School, Boston, MA
 1985 - 1990 Graduate Assistant in Medicine, Massachusetts General Hospital, Boston, MA
 1985 - 1988 Postdoctoral Fellow, Departments of Biology & Chemistry, Laboratory of Prof. H. G. Khorana, Massachusetts Institute of Technology, Cambridge, MA
 1988 - 1990 Research Associate, Departments of Biology & Chemistry, Massachusetts Institute of Technology, Cambridge, MA
 1990 Visiting Scientist, Departments of Biology & Chemistry, Massachusetts Institute of Technology, Cambridge, MA
 1990 - 1991 Assistant Professor & University Fellow, Rockefeller University, New York, NY
 1991 - 1994 Assistant Professor & Head of Laboratory of Molecular Biology & Biochemistry, Rockefeller University, New York, NY
 1991 - 1994 Assistant Investigator, Neurosciences Program, Howard Hughes Medical Institute
 1994 - 1998 Associate Professor & Head of Laboratory of Molecular Biology & Biochemistry, Rockefeller University, New York, New York
 1995 - 2000 Physician, Rockefeller University Hospital, Rockefeller University, New York, NY
 1998 - 2001 Adjunct Associate Professor, Program in Cell Biology and Genetics, Weill Graduate School of Medical Sciences of Cornell University, New York, NY
 1997 - 2002 Associate Dean for Graduate Studies (Tri-Institutional MD-PhD Program), Rockefeller University, New York, NY
 1994 - 2004 Associate Investigator, Neurosciences Program, Howard Hughes Medical Institute
 1998 - Professor & Head of Laboratory of Molecular Biology & Biochemistry, Rockefeller University, New York, NY
 2000 - Senior Physician, Rockefeller University Hospital, Rockefeller University, New York, NY
 2002 - 2005 Director, Pels Family Center for Chemistry, Biochemistry & Structural Biology, Rockefeller University, New York, NY
 2002 - 2003 Acting President, The Rockefeller University, New York, NY
 2002 - Richard M. & Isabel P. Furlaud Professor, Rockefeller University, New York, NY

Committees, Professional Memberships (selected)

NIH Visual Sciences Study Section, *ad hoc* Reviewer (1992); NIH Visual Sciences C Study Section, Special Reviewer (1995, 1996); NIH Visual Sciences C Study Section, Special Reviewer (1998); NIH Molecular, Cellular & Development Neuroscience Study Section - 3, Special Reviewer (1999); NIH Endocrinology Study Section, Special Reviewer (1999); NIH Pharmacology Study Section, Special Reviewer (2000); NIH BRT-A Review

Committee, *ad hoc* Reviewer & Site Visitor (2000); NIH Visual Sciences C Study Section, Special Reviewer (2001); Trustee, Aaron Diamond AIDS Research Center, New York, NY (2002 – 2003); Member of the Governing Council, Rockefeller Archive Center, Sleepy Hollow, NY (2002 – 2003); Trustee, Rockefeller University Board of Trustees, New York, NY (2002 – 2003); Trustee, Academic Medical Development Corporation (Am-Dec), New York, NY (2002 - 2003); Radcliffe Institute for Advanced Study Advisory Committee (2003 – 2006); Trustee, Helen Hay Whitney Foundation (2003 – present); Director, The Medical Letter (2004 – present); Chair, Rockefeller University Human Stem Cell Bioethics Group (2004 – 2006); NIH BDPE Study Section *ad hoc* Reviewer (2005); American Heart Association NEA5B Study Section (2005); NIH NIDDKD Board of Scientific Counselors, *ad hoc* Member (2005); NIH BDPE Study Section *ad hoc* Reviewer (2005, 2006); NIH NIDCD Board of Scientific Counselors, *ad hoc* Member (2008)

Honors

American Society for Photobiology (ASP), New Investigator Award (1995); Dr. George W. Raiziss Biochemical Rounds Lecturer (1999); Merck Frosst Lecturer (2000); Alfred E. Mirsky Lecturer (2001); Ellison Foundation Senior Scholar Award (2001); The Harvey Society (2001); The Practitioner's Society (2005); Merck Frosst Lecturer (2009)

B. Selected Peer-Reviewed Publications (20 from a total of 143).

- 1). Sakmar, T. P., Franke, R. R. & Khorana, H. G. Glutamic Acid 113 Serves as the Retinylidene Schiff Base Counterion in Bovine Rhodopsin.
Proc Natl Acad Sci U S A 86:8309–8313 (1989). [485 citations]
- 2). Franke, R. R., König, B., Sakmar, T. P., Khorana, H. G. & Hofmann, K. P. Rhodopsin Mutants That Bind But Fail to Activate Transducin.
Science 250:123–125 (1990) [299 citations]
- 3). Sheikh, S., Zvyaga, T. A., Lichtarge, O., Sakmar, T. P. & Bourne, H. R. Rhodopsin Activation Blocked by Metal-Ion-Binding Sites Linking Transmembrane Helices C and F.
Nature 383:347–350 (1996). [308 citations]
- 4). Donzella, G. A., Schols, D., Lin, S. W., Esté, J. A., Nagashima, K. A., Maddon, P. J., Allaway, G. P., Sakmar, T. P., Henson, G., De Clercq, E. & Moore, J. P. AMD3100, a Small Molecule Inhibitor of HIV-1 Entry via the CXCR4 Co-receptor.
Nature Med 4:72–77 (1998). [364 citations]
- 5). Hoelz, A., Janz, J.M., Lawrie, S.D., Corwin, B., Lee, A. & Sakmar, T.P. Crystal Structure of the SH3 Domain of β PIX in Complex with a High Affinity Peptide from PAK2.
J Mol Biol 358:509–522 (2006).
- 6). Su, C.Y., Luo, D.G., Tarakita, A., Shichida, Y., Liao, H.W., Kazmi, M.A., Sakmar, T.P. & Yau, K.W. Parietal-eye Phototransduction Components and Their Potential Evolutionary Implications.
Science 311:1617–1621 (2006).
- 7). Veldkamp, C. T., Seibert, C., Peterson, F. C., Sakmar, T. P. & Volkman, B. F. Recognition of a CXCR4 Sulfotyrosine by the Chemokine Stromal Cell-derived Factor-1 α (SDF-1 α /CXCL12).
J Mol Biol 359:1400–1409 (2006).
- 8). Vogel, R., Siebert, F., Yan, E. C. Y., Sakmar, T. P., Hirshfeld, A. & Sheves, M. Modulating Rhodopsin Receptor Activation by Altering the pKA of the Retinal Schiff Base.
J Am Chem Soc 128:10530–10512 (2006).
- 9). Botelho, A. V., Huber, T., Peterson, F. C., Sakmar, T. P. & Brown, M. F. Curvature and Hydrophobic Force Drive Oligomerization and Modulate Activity of Rhodopsin in Membranes.
Biophys J 91:4464–4477 (2006).
- 10). Sachdev, P., Menon, S., Kastner, D. B., Chuang, J. Z., Yeh, T. Y., Conde, C., Caceres, A., Sung, C. H. & Sakmar, T. P. G Protein $\beta\gamma$ Sununit Interaction with the Dynein Light-Chain Component Tctex-1 Regulates Neurite Outgrowth.
EMBO J 26:2621–2632 (2007).

- 11). Janz, J. M., Sakmar, T. P. & Min, K. C. A Novel Interaction Between AIP4 and β PIX is Mediated by an SH3 Domain.
J Biol Chem 282:28893–28903 (2007).
- 12). Periole, X., Huber, T., Marrink, S. J. & Sakmar, T. P. G Protein-coupled Receptors Self-assemble in Dynamics Simulations of Model Bilayers.
J Am Chem Soc 129:10126–10132 (2007).
- 13). Ye, S., Köhrer, C., Huber, T., Kazmi, M., Sachdev, P., Yan, E. C., Bhagat, A., Rajbhandary, U. L. & Sakmar, T. P. Site-specific Incorporation of Keto Amino Acids into Functional G Protein-coupled Receptors Using Unnatural Amino Acid Mutagenesis.
J Biol Chem 283:1525–1533 (2008).
- 14). Louis, M., Huber, T., Benton, R., Sakmar, T. P. & Vosshall, L. B. Bilateral Olfactory Sensory Input Enhances Chemotaxis Behavior.
Nat Neurosci 11:187–199 (2008).
- 15). Banerjee, S., Huber, T. & Sakmar, T. P. Rapid Incorporation of Functional Rhodopsin into Nanoscale Apolipoprotein Bound Bilayer (NABB) Particles.
J Mol Biol 377:1067–1081 (2008).
- 16). Huber, T. & Sakmar, T. P. Rhodopsin's Active State Is Frozen Like a DEER in the Headlights.
Proc Natl Acad Sci U S A 105:7343–7344 (2008).
- 17). Veldkamp, C. T., Seibert, C., Peterson, F. C., De la Cruz, N. B., Haugner, III, J. C., Basnet, H., Sakmar, T. P. & Volkman, B. F. Structural Basis of CXCR4 Sulfotyrosine Recognition by the Chemokine SDF-1/CXCL12.
Sci Signal 1:ra4 (2008).
- 18). Huber, T., Menon, S. & Sakmar, T. P. Structural Basis for Ligand Binding and Specificity in Adrenergic Receptors: Implications for GPCR-Targeted Drug Discovery.
Biochemistry 47:11013–11023 (2008).
- 19). Seibert, C., Veldkamp, C.T., Peterson, F.C., Chait, B.T., Volkman, B.F. & Sakmar, T.P. Sequential Tyrosine Sulfation of CXCR4 by Tyrosylprotein Sulfotransferases.
Biochemistry 47:11251–11262 (2008).
- 20). Ye, S., Huber, T., Vogel, R. & Sakmar, T. P. FTIR Analysis of GPCR Activation Using Azido Probes.
Nat Chem Biol 5:397–399 (2009).