

Stanford



Brian Kobilka

Helene Irwin Fagan Chair in Cardiology
Molecular & Cellular Physiology

Bio

ACADEMIC APPOINTMENTS

- Professor, Molecular & Cellular Physiology
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

LINKS

- Personal Web site: <http://med.stanford.edu/kobikalab/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My laboratory is involved in studying several aspects of adrenergic receptor biology. Adrenergic receptors form the interface between the sympathetic nervous system and the cardiovascular system and play a critical role in the regulation of cardiovascular function. Specific projects include:

1- RECEPTOR STRUCTURE: We are interested in understanding the three dimensional structure of adrenergic receptors and learning about the conformational changes that mediate signal transduction. We are taking several experimental approaches including mutagenesis, biochemical, and biophysical studies.

2-INTRACELLULAR TRAFFICKING OF ADRENERGIC RECEPTORS: The function of receptors can be modulated by changes in receptor structure (phosphorylation) and by changes in subcellular localization. We are using immunocytochemical approaches to study the targeting of receptors to specific subcellular domains and agonist mediated redistribution of receptors. Our goal is to determine the functional significance of differences in targeting and trafficking that we have observed in several adrenergic receptors, and to identify cellular proteins that mediate receptor trafficking.

3-PHYSIOLOGIC RELEVANCE OF ADRENERGIC RECEPTOR SUBTYPE DIVERSITY: Multiple closely related subtypes of adrenergic receptors have been identified through cloning studies. We are using targeted gene modification in mice to study the physiologic role of these closely related subtypes. We have disrupted the genes for five adrenergic receptors (alpha 2a, alpha 2b, alpha 2c, beta 1, and beta2) and are investigating the consequence of these disruptions on neural and cardiovascular physiology.

Teaching

COURSES

2019-20

- Pharmacological Treatment of Disease: INDE 260A (Win)
- Pharmacological Treatment of Disease: INDE 260B (Win)

2018-19

- Pharmacological Treatment of Disease: INDE 260A (Win)
- Pharmacological Treatment of Disease: INDE 260B (Win)

STANFORD ADVISEES

Med Scholar Project Advisor

Yagmur Muftuoglu

Doctoral Dissertation Reader (AC)

Thomas Chew, Robert Coukos, Chase Wood

Postdoctoral Faculty Sponsor

Marina Casiraghi, Franziska Heydenreich, John Janetzko, Antoine Koehl, Kaavya Krishna Kumar, Evan O'Brien, Rabindra Shivnaraine, Haoqing Wang

Doctoral Dissertation Co-Advisor (AC)

Madeleine Scott

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biophysics (Phd Program)
- Molecular and Cellular Physiology (Phd Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Structural insights into the subtype-selective antagonist binding to the M2 muscarinic receptor.** *Nature chemical biology*
Suno, R., Lee, S., Maeda, S., Yasuda, S., Yamashita, K., Hirata, K., Horita, S., Tawaramoto, M. S., Tsujimoto, H., Murata, T., Kinoshita, M., Yamamoto, M., Kobilka, et al
2018
- **Structure-guided development of selective M3 muscarinic acetylcholine receptor antagonists.** *Proceedings of the National Academy of Sciences of the United States of America*
Liu, H., Hofmann, J., Fish, I., Schaake, B., Eitel, K., Bartuschat, A., Kaindl, J., Ramp, H., Banerjee, A., Hubner, H., Clark, M. J., Vincent, S. G., Fisher, et al
2018
- **Structural insights into binding specificity, efficacy and bias of a beta2AR partial agonist.** *Nature chemical biology*
Masureel, M., Zou, Y., Picard, L., van der Westhuizen, E., Mahoney, J. P., Rodrigues, J. P., Mildorf, T. J., Dror, R. O., Shaw, D. E., Bouvier, M., Pardon, E., Steyaert, J., Sunahara, et al
2018; 14 (11): 1059–66
- **Rationally Engineered Tandem Facial Amphiphiles for Improved Membrane Protein Stabilization Efficacy** *CHEMBIOCHEM*
Das, M., Du, Y., Mortensen, J. S., Hariharan, P., Lee, H., Byrne, B., Loland, C. J., Guan, L., Kobilka, B. K., Chae, P.
2018; 19 (20): 2225–32

- **A comparative study of branched and linear mannitol-based amphiphiles on membrane protein stability.** *The Analyst*
Hussain, H., Helton, T., Du, Y., Mortensen, J. S., Hariharan, P., Ehsan, M., Byrne, B., Loland, C. J., Kobilka, B. K., Guan, L., Chae, P. S.
2018
- **Development of an antibody fragment that stabilizes GPCR/G-protein complexes.** *Nature communications*
Maeda, S., Koehl, A., Matile, H., Hu, H., Hilger, D., Schertler, G. F., Manglik, A., Skiniotis, G., Dawson, R. J., Kobilka, B. K.
2018; 9 (1): 3712
- **Structural mechanisms of selectivity and gating in anion channelrhodopsins.** *Nature*
Kato, H. E., Kim, Y. S., Paggi, J. M., Evans, K. E., Allen, W. E., Richardson, C., Inoue, K., Ito, S., Ramakrishnan, C., Fenno, L. E., Yamashita, K., Hilger, D., Lee, et al
2018
- **Crystal structure of the natural anion-conducting channelrhodopsin GtACR1.** *Nature*
Kim, Y. S., Kato, H. E., Yamashita, K., Ito, S., Inoue, K., Ramakrishnan, C., Fenno, L. E., Evans, K. E., Paggi, J. M., Dror, R. O., Kandori, H., Kobilka, B. K., Deisseroth, et al
2018
- **Indole-based positive allosteric modulators for targeting CB1 receptor to overcome neuropathic pain**
Resendez, A., Kumar, K., Kumar, V., Kobilka, B., Malhotra, S.
AMER CHEMICAL SOC.2018
- **Single Proteoliposome High-Content Analysis Reveals Differences in the Homo-Oligomerization of GPCRs**
Walsh, S. M., Mathiasen, S., Christensen, S. M., Fay, J. F., King, C., Provasi, D., Borrero, E., Rasmussen, S. F., Fung, J., Filizola, M., Hristova, K., Kobilka, B., Farrens, et al
CELL PRESS.2018: 300–312
- **An Engineered Lithocholate-Based Facial Amphiphile Stabilizes Membrane Proteins: Assessing the Impact of Detergent Customizability on Protein Stability** *CHEMISTRY-A EUROPEAN JOURNAL*
Das, M., Du, Y., Mortensen, J. S., Bae, H., Byrne, B., Loland, C. J., Kobilka, B. K., Chae, P.
2018; 24 (39): 9860–68
- **The Molecular Basis of G Protein-Coupled Receptor Activation.** *Annual review of biochemistry*
Weis, W. I., Kobilka, B. K.
2018; 87: 897–919
- **Structure of the μ -opioid receptor-Gi protein complex.** *Nature*
Koehl, A., Hu, H., Maeda, S., Zhang, Y., Qu, Q., Paggi, J. M., Latorraca, N. R., Hilger, D., Dawson, R., Matile, H., Schertler, G. F., Granier, S., Weis, et al
2018
- **Structural Properties of the Human Protease-Activated Receptor 1 Changing by a Strong Antagonist** *STRUCTURE*
Spoerri, P. M., Kato, H. E., Pfreundschuh, M., Mari, S. A., Serdiuk, T., Thoma, J., Sapra, K., Zhang, C., Kobilka, B. K., Muller, D. J.
2018; 26 (6): 829-+
- **Structure-based discovery of selective positive allosteric modulators of antagonists for the M-2 muscarinic acetylcholine receptor** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Korczyńska, M., Clark, M. J., Valant, C., Xu, J., Von Moo, E., Albold, S., Weiss, D. R., Torosyan, H., Huang, W., Kruse, A. C., Lyda, B. R., May, L. T., Baltos, et al
2018; 115 (10): E2419–E2428
- **Structure and dynamics of GPCR signaling complexes** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
Hilger, D., Masureel, M., Kobilka, B. K.
2018; 25 (1): 4–12
- **Single-molecule analysis of ligand efficacy in beta(2)AR-G-protein activation** *NATURE*
Gregorio, G., Masureel, M., Hilger, D., Terry, D. S., Juette, M., Zhao, H., Zhou, Z., Perez-Aguilar, J., Hauge, M., Mathiasen, S., Javitch, J. A., Weinstein, H., Kobilka, et al
2017; 547 (7661): 68-+
- **Cryo-EM structure of the activated GLP-1 receptor in complex with a G protein.** *Nature*
Zhang, Y., Sun, B., Feng, D., Hu, H., Chu, M., Qu, Q., Tarrasch, J. T., Li, S., Sun Kobilka, T., Kobilka, B. K., Skiniotis, G.

2017; 546 (7657): 248-253

- **Structural and Functional Analysis of a beta(2)-Adrenergic Receptor Complex with GRK5** *Cell*
Komolov, K. E., Du, Y., Duc, N. M., Betz, R. M., Rodrigues, J. P., Leib, R. D., Patra, D., Skiniotis, G., Adams, C. M., Dror, R. O., Chung, K. Y., Kobilka, B. K., Benovic, et al
2017; 169 (3): 407-421 e16
- **Crystal structure of the adenosine A(2A) receptor bound to an antagonist reveals a potential allosteric pocket** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Sun, B., Bachhawat, P., Chu, M. L., Wood, M., Ceska, T., Sands, Z. A., Mercier, J., Lebon, F., Kobilka, T. S., Kobilka, B. K.
2017; 114 (8): 2066-2071
- **Nanobodies to Study G Protein-Coupled Receptor Structure and Function.** *Annual review of pharmacology and toxicology*
Manglik, A., Kobilka, B. K., Steyaert, J.
2017; 57: 19-37
- **Structure-based discovery of opioid analgesics with reduced side effects** *NATURE*
Manglik, A., Lin, H., Aryal, D. K., McCorvy, J. D., Dengler, D., Corder, G., Levit, A., Kling, R. C., Bernat, V., Huebner, H., Huang, X., Sassano, M. F., Giguere, et al
2016; 537 (7619): 185-?
- **Structure-based discovery of opioid analgesics with reduced side effects.** *Nature*
Manglik, A., Lin, H., Aryal, D. K., McCorvy, J. D., Dengler, D., Corder, G., Levit, A., Kling, R. C., Bernat, V., Hübner, H., Huang, X., Sassano, M. F., Giguère, et al
2016; 537 (7619): 185-190
- **Allosteric coupling from G protein to the agonist-binding pocket in GPCRs** *NATURE*
DeVree, B. T., Mahoney, J. P., Velez-Ruiz, G. A., Rasmussen, S. G., Kuszak, A. J., Edwald, E., Fung, J., Manglik, A., Masureel, M., Du, Y., Matt, R. A., Pardon, E., Steyaert, et al
2016; 535 (7610): 182-?
- **Accessible Mannitol-Based Amphiphiles (MNAs) for Membrane Protein Solubilisation and Stabilisation** *CHEMISTRY-A EUROPEAN JOURNAL*
Hussain, H., Du, Y., Scull, N. J., Mortensen, J. S., Tarrasch, J., Bae, H. E., Loland, C. J., Byrne, B., Kobilka, B. K., Chae, P. S.
2016; 22 (21): 7068-7073
- **Highly Branched Pentasaccharide-Bearing Amphiphiles for Membrane Protein Studies** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
Ehsan, M., Du, Y., Scull, N. J., Tikhonova, E., Tarrasch, J., Mortensen, J. S., Loland, C. J., Skiniotis, G., Guan, L., Byrne, B., Kobilka, B. K., Chae, P. S.
2016; 138 (11): 3789-3796
- **Crystal structures of the M1 and M4 muscarinic acetylcholine receptors.** *Nature*
Thal, D. M., Sun, B., Feng, D., Nawaratne, V., Leach, K., Felder, C. C., Bures, M. G., Evans, D. A., Weis, W. I., Bachhawat, P., Kobilka, T. S., Sexton, P. M., Kobilka, et al
2016; 531 (7594): 335-340
- **Crystal structures of the M1 and M4 muscarinic acetylcholine receptors.** *Nature*
Thal, D. M., Sun, B., Feng, D., Nawaratne, V., Leach, K., Felder, C. C., Bures, M. G., Evans, D. A., Weis, W. I., Bachhawat, P., Kobilka, T. S., Sexton, P. M., Kobilka, et al
2016; 531 (7594): 335-340
- **In meso in situ serial X-ray crystallography of soluble and membrane proteins at cryogenic temperatures** *ACTA CRYSTALLOGRAPHICA SECTION D-STRUCTURAL BIOLOGY*
Huang, C., Olieric, V., Ma, P., Howe, N., Vogeley, L., Liu, X., Warshamanage, R., Weinert, T., Panepucci, E., Kobilka, B., Diederichs, K., Wang, M., Caffrey, et al
2016; 72: 93-112
- **Allosteric regulation of G protein-coupled receptor activity by phospholipids** *NATURE CHEMICAL BIOLOGY*
Dawaliby, R., Trubbia, C., Delporte, C., Masureel, M., Van Antwerpen, P., Kobilka, B. K., Govaerts, C.
2016; 12 (1): 35-?
- **Tandem neopentyl glycol maltosides (TNMs) for membrane protein stabilisation** *CHEMICAL COMMUNICATIONS*
Bae, H. E., Mortensen, J. S., Ribeiro, O., Du, Y., Ehsan, M., Kobilka, B. K., Loland, C. J., Byrne, B., Chae, P. S.
2016; 52 (81): 12104-12107

- **High-density grids for efficient data collection from multiple crystals.** *Acta crystallographica. Section D, Structural biology*
Baxter, E. L., Aguilá, L., Alonso-Mori, R., Barnes, C. O., Bonagura, C. A., Brehmer, W., Brunger, A. T., Calero, G., Caradoc-Davies, T. T., Chatterjee, R., DeGrado, W. F., Fraser, J. S., Ibrahim, et al
2016; 72: 2-11
- **Imaging G protein-coupled receptors while quantifying their ligand-binding free-energy landscape** *NATURE METHODS*
Alsteens, D., Pfreundschuh, M., Zhang, C., Spoerri, P. M., Coughlin, S. R., Kobilka, B. K., Mueller, D. J.
2015; 12 (9): 845-?
- **Imaging G protein-coupled receptors while quantifying their ligand-binding free-energy landscape.** *Nature methods*
Alsteens, D., Pfreundschuh, M., Zhang, C., Spoerri, P. M., Coughlin, S. R., Kobilka, B. K., Müller, D. J.
2015; 12 (9): 845-851
- **Structural insights into μ -opioid receptor activation.** *Nature*
Huang, W., Manglik, A., Venkatakrishnan, A. J., Laeremans, T., Feinberg, E. N., Sanborn, A. L., Kato, H. E., Livingston, K. E., Thorsen, T. S., Kling, R. C., Granier, S., Gmeiner, P., Husbands, et al
2015; 524 (7565): 315-321
- **Structural insights into mu-opioid receptor activation** *NATURE*
Huang, W., Manglik, A., Venkatakrishnan, A. J., Laeremans, T., Feinberg, E. N., Sanborn, A. L., Kato, H. E., Livingston, K. E., Thorsen, T. S., Kling, R. C., Granier, S., Gmeiner, P., Husbands, et al
2015; 524 (7565): 315-?
- **Propagation of conformational changes during mu-opioid receptor activation** *NATURE*
Sounier, R., Mas, C., Steyaert, J., Laeremans, T., Manglik, A., Huang, W., Kobilka, B. K., Demene, H., Granier, S.
2015; 524 (7565): 375-?
- **Propagation of conformational changes during μ -opioid receptor activation.** *Nature*
Sounier, R., Mas, C., Steyaert, J., Laeremans, T., Manglik, A., Huang, W., Kobilka, B. K., Déméné, H., Granier, S.
2015; 524 (7565): 375-378
- **Novel Xylene-Linked Maltoside Amphiphiles (XMAs) for Membrane Protein Stabilisation.** *Chemistry (Weinheim an der Bergstrasse, Germany)*
Cho, K. H., Du, Y., Scull, N. J., Hariharan, P., Gotfryd, K., Loland, C. J., Guan, L., Byrne, B., Kobilka, B. K., Chae, P. S.
2015; 21 (28): 10008-10013
- **SIGNAL TRANSDUCTION. Structural basis for nucleotide exchange in heterotrimeric G proteins.** *Science*
Dror, R. O., Mildorf, T. J., Hilger, D., Manglik, A., Borhani, D. W., Arlow, D. H., Philippsen, A., Villanueva, N., Yang, Z., Lerch, M. T., Hubbell, W. L., Kobilka, B. K., Sunahara, et al
2015; 348 (6241): 1361-1365
- **Structural basis for nucleotide exchange in heterotrimeric G proteins** *SCIENCE*
Dror, R. O., Mildorf, T. J., Hilger, D., Manglik, A., Borhani, D. W., Arlow, D. H., Philippsen, A., Villanueva, N., Yang, Z., Lerch, M. T., Hubbell, W. L., Kobilka, B. K., Sunahara, et al
2015; 348 (6241): 1361-1365
- **Structural Insights into the Dynamic Process of beta(2)-Adrenergic Receptor Signaling** *CELL*
Manglik, A., Kim, T. H., Masureel, M., Altenbach, C., Yang, Z., Hilger, D., Lerch, M. T., Kobilka, T. S., Thian, F. S., Hubbell, W. L., Prosser, R. S., Kobilka, B. K.
2015; 161 (5): 1101-1111
- **Effective Application of Bicelles for Conformational Analysis of G Protein-Coupled Receptors by Hydrogen/Deuterium Exchange Mass Spectrometry** *JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY*
Nguyen Minh Duc, N. M., Du, Y., Thorsen, T. S., Lee, S. Y., Zhang, C., Kato, H., Kobilka, B. K., Chung, K. Y.
2015; 26 (5): 808-817
- **Identifying and quantifying two ligand-binding sites while imaging native human membrane receptors by AFM.** *Nature communications*
Pfreundschuh, M., Alsteens, D., Wieneke, R., Zhang, C., Coughlin, S. R., Tampé, R., Kobilka, B. K., Müller, D. J.
2015; 6: 8857-?
- **Development and Characterization of Pepducins as Gs-biased Allosteric Agonists.** *journal of biological chemistry*
Carr, R., Du, Y., Quoyer, J., Panettieri, R. A., Janz, J. M., Bouvier, M., Kobilka, B. K., Benovic, J. L.

2014; 289 (52): 35668-35684

- **Goniometer-based femtosecond crystallography with X-ray free electron lasers** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Cohen, A. E., Soltis, S. M., Gonzalez, A., Aguila, L., Alonso-Mori, R., Barnes, C. O., Baxter, E. L., Brehmer, W., Brewster, A. S., Brunger, A. T., Calero, G., Chang, J. F., Chollet, et al
2014; 111 (48): 17122-17127
- **Modified T4 Lysozyme Fusion Proteins Facilitate G Protein-Coupled Receptor Crystallogensis** *STRUCTURE*
Thorsen, T. S., Matt, R., Weis, W. I., Kobilka, B. K.
2014; 22 (11): 1657-1664
- **Nanoscale high-content analysis using compositional heterogeneities of single proteoliposomes.** *Nature methods*
Mathiasen, S., Christensen, S. M., Fung, J. J., Rasmussen, S. G., Fay, J. F., Jorgensen, S. K., Veshaguri, S., Farrens, D. L., Kiskowski, M., Kobilka, B., Stamou, D.
2014; 11 (9): 931-934
- **Visualization of arrestin recruitment by a G-protein-coupled receptor** *NATURE*
Shukla, A. K., Westfield, G. H., Xiao, K., Reis, R. I., Huang, L., Tripathi-Shukla, P., Qian, J., Li, S., Blanc, A., Oleskie, A. N., Dosey, A. M., Su, M., Liang, et al
2014; 512 (7513): 218-?
- **Covalent agonists for studying G protein-coupled receptor activation.** *Proceedings of the National Academy of Sciences of the United States of America*
Weichert, D., Kruse, A. C., Manglik, A., Hiller, C., Zhang, C., Hübner, H., Kobilka, B. K., Gmeiner, P.
2014; 111 (29): 10744-10748
- **Novel Insights into M-3 Muscarinic Acetylcholine Receptor Physiology and Structure** *14th International Symposium on Cholinergic Mechanisms (ISCM)*
Kruse, A. C., Li, J., Hu, J., Kobilka, B. K., Wess, J.
HUMANA PRESS INC.2014: 316-23
- **Muscarinic acetylcholine receptors: novel opportunities for drug development** *NATURE REVIEWS DRUG DISCOVERY*
Kruse, A. C., Kobilka, B. K., Gautam, D., Sexton, P. M., Christopoulos, A., Wess, J.
2014; 13 (7): 549-560
- **Muscarinic acetylcholine receptor X-ray structures: potential implications for drug development** *CURRENT OPINION IN PHARMACOLOGY*
Kruse, A. C., Hu, J., Kobilka, B. K., Wess, J.
2014; 16: 24-30
- **The role of protein dynamics in GPCR function: insights from the beta(2)AR and rhodopsin** *CURRENT OPINION IN CELL BIOLOGY*
Manglik, A., Kobilka, B.
2014; 27: 136-143
- **A general protocol for the generation of Nanobodies for structural biology** *NATURE PROTOCOLS*
Pardon, E., Laeremans, T., Triest, S., Rasmussen, S. G., Wohlkoenig, A., Ruf, A., Muyldermans, S., Hol, W. G., Kobilka, B. K., Steyaert, J.
2014; 9 (3): 674-693
- **Regulation of beta(2)-Adrenergic Receptor Function by Conformationally Selective Single-Domain Intrabodies** *MOLECULAR PHARMACOLOGY*
Staus, D. P., Winkler, L. M., Strachan, R. T., Rasmussen, S. G., Pardon, E., Ahn, S., Steyaert, J., Kobilka, B. K., Lefkowitz, R. J.
2014; 85 (3): 472-481
- **Activation and allosteric modulation of a muscarinic acetylcholine receptor** *NATURE*
Kruse, A. C., Ring, A. M., Manglik, A., Hu, J., Hu, K., Eitel, K., Huebner, H., Pardon, E., Valant, C., Sexton, P. M., Christopoulos, A., Felder, C. C., Gmeiner, et al
2013; 504 (7478): 101-?
- **Novel Tripod Amphiphiles for Membrane Protein Analysis** *CHEMISTRY-A EUROPEAN JOURNAL*
Chae, P. S., Kruse, A. C., Gotfryd, K., Rana, R. R., Cho, K. H., Rasmussen, S. G., Bae, H. E., Chandra, R., Gether, U., Guan, L., Kobilka, B. K., Loland, C. J., Byrne, et al
2013; 19 (46): 15645-15651
- **Applications of molecular replacement to G protein-coupled receptors** *ACTA CRYSTALLOGRAPHICA SECTION D-BIOLOGICAL CRYSTALLOGRAPHY*
Kruse, A. C., Manglik, A., Kobilka, B. K., Weis, W. I.
2013; 69: 2287-2292

- **Adrenaline-activated structure of β 2-adrenoceptor stabilized by an engineered nanobody.** *Nature*
Ring, A. M., Manglik, A., Kruse, A. C., Enos, M. D., Weis, W. I., Garcia, K. C., Kobilka, B. K.
2013; 502 (7472): 575-579
- **Muscarinic receptors as model targets and antitargets for structure-based ligand discovery.** *Molecular pharmacology*
Kruse, A. C., Weiss, D. R., Rossi, M., Hu, J., Hu, K., Eitel, K., Gmeiner, P., Wess, J., Kobilka, B. K., Shoichet, B. K.
2013; 84 (4): 528-540
- **Muscarinic Receptors as Model Targets and Antitargets for Structure-Based Ligand Discovery** *MOLECULAR PHARMACOLOGY*
Kruse, A. C., Weiss, D. R., Rossi, M., Hu, J., Hu, K., Eitel, K., Gmeiner, P., Wess, J., Kobilka, B. K., Shoichet, B. K.
2013; 84 (4): 528-540
- **Correction to "tandem facial amphiphiles for membrane protein stabilization".** *Journal of the American Chemical Society*
Chae, P. S., Gotfryd, K., Pacyna, J., Miercke, L. J., Rasmussen, S. G., Robbins, R. A., Rana, R. R., Loland, C. J., Kobilka, B., Stroud, R., Byrne, B., Gether, U., Gellman, et al
2013; 135 (34): 12922-?
- **Quantifying and localizing interactions guiding the structural and functional properties of GPCRs** *9th European-Biophysical-Societies-Association Congress*
Zocher, M., Kawamura, S., Cheng, Z., Paul, P. S., Kobilka, B. K., Muller, D. J.
SPRINGER.2013: S108-S108
- **The role of ligands on the equilibria between functional States of a g protein-coupled receptor.** *Journal of the American Chemical Society*
Kim, T. H., Chung, K. Y., Manglik, A., Hansen, A. L., Dror, R. O., Mildorf, T. J., Shaw, D. E., Kobilka, B. K., Prosser, R. S.
2013; 135 (25): 9465-9474
- **Structure of active β -arrestin-1 bound to a G-protein-coupled receptor phosphopeptide.** *Nature*
Shukla, A. K., Manglik, A., Kruse, A. C., Xiao, K., Reis, R. I., Tseng, W., Staus, D. P., Hilger, D., Uysal, S., Huang, L., Paduch, M., Tripathi-Shukla, P., Koide, et al
2013; 497 (7447): 137-141
- **The Dynamic Process of beta(2)-Adrenergic Receptor Activation** *CELL*
Nygaard, R., Zou, Y., Dror, R. O., Mildorf, T. J., Arlow, D. H., Manglik, A., Pan, A. C., Liu, C. W., Fung, J. J., Bokoch, M. P., Thian, F. S., Kobilka, T. S., Shaw, et al
2013; 152 (3): 532-542
- **Identification of GPCR-Interacting Cytosolic Proteins Using HDL Particles and Mass Spectrometry-Based Proteomic Approach** *PLOS ONE*
Chung, K. Y., Day, P. W., Velez-Ruiz, G., Sunahara, R. K., Kobilka, B. K.
2013; 8 (1)
- **Glucose-Neopentyl Glycol (GNG) amphiphiles for membrane protein study** *CHEMICAL COMMUNICATIONS*
Chae, P. S., Rana, R. R., Gotfryd, K., Rasmussen, S. G., Kruse, A. C., Cho, K. H., Capaldi, S., Carlsson, E., Kobilka, B., Loland, C. J., Gether, U., Banerjee, S., Byrne, et al
2013; 49 (23): 2287-2289
- **The Structural Basis of G-Protein-Coupled Receptor Signaling (Nobel Lecture)** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*
Kobilka, B.
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