

Derek S. Tan, PhD

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PROFESSIONAL APPOINTMENTS

- 3/08–present **Tri-Institutional Associate Professor**, Sloan–Kettering Institute for Cancer Research (primary appointment), Cornell University (Weill Medical College and Department of Chemistry & Chemical Biology), and The Rockefeller University.
- 3/08–present **Associate Member and Laboratory Head**, Molecular Pharmacology & Chemistry Program, Sloan–Kettering Institute for Cancer Research, Memorial Sloan–Kettering Cancer Center (MSKCC).
- 3/03–3/08 **Tri-Institutional Assistant Professor**, Sloan–Kettering Institute for Cancer Research (primary appointment), Cornell University (Weill Medical College and Department of Chemistry & Chemical Biology), and The Rockefeller University.
- 5/02–3/08 **Assistant Member and Laboratory Head**, Molecular Pharmacology & Chemistry Program, Sloan–Kettering Institute for Cancer Research, Memorial Sloan–Kettering Cancer Center (MSKCC).
- 1/04–present **Program Faculty**, Gerstner Sloan–Kettering Graduate School of Biomedical Sciences, MSKCC.
- 10/02–present **Program Faculty** (Associate Professor 2008–present; Assistant Professor 2002–2008), Pharmacology Program, Weill Graduate School of Medical Sciences, Cornell University.
- 9/02–present **Program Faculty**, Experimental Therapeutics Center, MSKCC.
- 5/02–present **Program Faculty**, Tri-Institutional Training Program in Chemical Biology, Sloan–Kettering Institute for Cancer Research, Cornell University, and The Rockefeller University.

EDUCATION AND TRAINING

- 9/00–4/02 **Postdoctoral Research Fellow** (with Prof. Samuel J. Danishefsky), Laboratory of Bioorganic Chemistry, Sloan–Kettering Institute for Cancer Research, MSKCC. *Total synthesis of guanacastepene A and synthetic studies toward spiroxin A.*
- 9/95–8/00 **Ph. D. in Chemistry** (with Prof. Stuart L. Schreiber), Department of Chemistry and Chemical Biology, Harvard University. *Diversity-oriented synthesis targeted to chemical genetics.*
- 6/95–8/95 **Summer Research Intern** (with Dr. David A. Oare), Bioorganic Chemistry Department, Genentech, Inc. *Solid phase synthesis of peptide β -turn mimics.*
- 9/91–6/95 **B. S. in Chemistry with Distinction and Honors** (with Prof. Dale G. Drueckhammer), Department of Chemistry, Stanford University. *Enzymatic dynamic kinetic resolution of α -substituted propionate thioesters.*

TEACHING ACTIVITIES

- 9/02–present **Pharmacology I: Chemical Biology** (Co-Course Director & Lecturer), Pharmacology Program, Weill Graduate School of Medical Sciences, Cornell University. *Topics:* organic reaction mechanisms, biological and laboratory synthesis of primary and secondary metabolites, combinatorial chemistry.
- 4/03–present **Pharmacology IV: Molecular Pharmacology of Cancer** (Lecturer), Pharmacology Program, Weill Graduate School of Medical Sciences, Cornell University. *Topic:* natural product anti-cancer agents.
- 12/06 **Cancer Biology Core Course** (Lecturer), Cancer Biology Graduate Program, Gerstner Sloan–Kettering Graduate School of Biomedical Sciences, MSKCC. *Topic:* cell cycle inhibitors
- 9/03–9/04 **Frontiers in Biomedical Science** (Lecturer), Tri-Institutional MD–PhD Program. *Topic:* small molecule inhibition of protein–protein interactions.

FELLOWSHIPS AND SCHOLARSHIPS

- 2007–2009 Alfred P. Sloan Research Fellow
- 2005–2007 James D. Watson Investigator, NYSTAR
- 2001–2002 Damon Runyon Cancer Research Foundation Postdoctoral Fellowship
- 2000 American Cancer Society Postdoctoral Fellowship (declined)
- 2000 NIH National Research Service Award Postdoctoral Fellowship (declined)
- 1998–1999 Roche Graduate Fellowship in Organic Chemistry
- 1995–1998 National Defense Science and Engineering Graduate Fellowship
- 1995 NSF Graduate Fellowship (declined)
- 1994 Pfizer Summer Undergraduate Fellowship in Synthetic Organic Chemistry
- 1991–1995 National Merit Scholarship
- 1991–1992 Robert Byrd Honors Scholarship

HONORS AND AWARDS

- 1995–1996 Certificate of Distinction in Teaching, Harvard University
- 1995 Phi Beta Kappa
- 1995 Marsden Prize in Chemistry, Stanford University
- 1991–1992 President's Award for Academic Excellence, Stanford University
- 1991–1992 Jordan Scholar, Stanford University
- 1991–1992 Scholar Athlete Award, Stanford University

OTHER PROFESSIONAL ACTIVITIES

- 2008 Member, NIH U54 Molecular Libraries Probe Production Center Network Special Review Panel
- 2007–present Scientific Consultant, Gerson Lehrman Group
- 2007–present Editorial Board, *Current Molecular Pharmacology*
- 2007 *Ad hoc* Reviewer, NSF Division of Chemistry
- 2006–2007 Scientific Consultant, ThinkEquity Partners LLC
- 2006 Scientific Consultant, Prof. Arti K. Rai, Duke Law School
- 2006 *Ad hoc* Member, NIH Synthetic and Biological Chemistry B Study Section
- 2005–present Advisory Board, Tri-Institutional Training Program in Chemical Biology
- 2005 Scientific Consultant, Lilly Ventures
- 2004–present Member, New York Academy of Sciences

2004–present Member, Acfas – Association francophone pour le savoir, Canada
2003–present Scientific Advisory Board, Québec Combinatorial Chemistry Consortium
2003 Scientific Advisory Board, CHI Diversity Oriented Synthesis Conference
2002–present Member, Harvey Society
1996–present Member, American Association for the Advancement of Science
1996–present Member, American Chemical Society

PEER REVIEWER

Accounts of Chemical Research, Bioorganic & Medicinal Chemistry, Chemical Communications, Chemistry & Biology, Journal of the American Chemical Society, Journal of Organic Chemistry, Molecular BioSystems, Nature Biotechnology, Nature Chemical Biology, Neuron, Organic Letters, Proceedings of the National Academy of Sciences USA, Tetrahedron, Tetrahedron Letters

PERSONAL INFORMATION AND ACTIVITIES

Born in Rochester, New York Second language: French

SCUBA Diving – FFESSM Brevet Élémentaire (1989); PADI Advanced Open Water Diver (2004); PADI Enriched Air/Nitrox Diver (2005); PADI Wreck Diver (2006); PADI Deep Diver (2006); Emergency First Responder (CPR/AED/First Aid) (2008); PADI Rescue Diver (2008).

Road Racing & Track – Warren Street Social & Athletic Club (2003–present); MSKCC Corporate Challenge Team (2002–present); New York Road Runners Club (2001–present); Stanford University Varsity Track Team (1991–1992); New York City Marathon finisher (2003).

National Center for Missing & Exploited Children – Advisory Board, Manhattan Affiliate Office (2003–2007); Volunteer, New York Branch/Adam Walsh Child Resource Center (1987–1991). <http://www.missingkids.org>

Music and Theater – *Stanford University Band* – Financial Manager (1993–94), Public Relations Director (1992–93), Principal Trombone (1992–94). *Music Director* – “Once on this Island” (1995), “Anything Goes” (1995), “Big Game Gaieties” (1994), “Anything Goes” (1994), “Sweet Charity” (1993), “Boanthropy” (1992).

PUBLICATIONS

Independent

- 25) Lu, X.; Zhang, H.; Tonge, P. J.*; Tan, D. S.* “Mechanism-based inhibitors of MenE, an acyl-CoA synthetase involved in bacterial menaquinone biosynthesis.” *Bioorg. Med. Chem. Lett.*, in press; doi:10.1016/j.bmcl.2008.07.130. (Invited contribution to Special Issue in honor of Prof. Benjamin F. Cravatt, 2008 Tetrahedron Young Investigator Award).
- 24) Cisar, J. S.; Tan, D. S.* “Small molecule inhibition of microbial natural product biosynthesis – An emerging antibiotic strategy.” *Chem. Soc. Rev.* **2008**, 37, 1320–1329 (Invited review).
- 23) Ferreras, J. A.; Stirrett, K. L.; Lu, X.; Ryu, J.-S.; Soll, C. E.; Tan, D. S.; Quadri, L. E. N.* “Mycobacterial PGL virulence factor biosynthesis: Mechanism and small-molecule inhibition of polyketide chain initiation.” *Chem. Biol.* **2008**, 15, 51–61.
- Highlighted in *Chem. Biol.* **2008**, 15, xi.
- 22) Cisar, J. S.; Ferreras, J. A.; Soni, R. K.; Quadri, L. E. N.*; Tan, D. S.* “Exploiting ligand conformation in selective inhibition of non-ribosomal peptide synthetase amino acid adenylation with designed macrocyclic small molecules.” *J. Am. Chem. Soc.* **2007**, 129, 7752–7753.
- Highlighted in *Faculty of 1000 Biology* (article ID 1087363).
- 21) Shang, S.; Iwadare, H.; Macks, D. E.; Ambrosini, L. M.; Tan, D. S.* “A unified approach to polyketides having both skeletal and stereochemical diversity.” *Org. Lett.* **2007**, 9, 1895–1898.
- 20) Moilanen, S. B.; Potuzak, J. S.; Tan, D. S.* “Stereocontrolled synthesis of spiroketals via Ti(Oi-Pr)₄-mediated kinetic spirocyclization of glycol epoxides with retention of configuration.” *J. Am. Chem. Soc.* **2006**, 128, 1792–1793.
- Highlighted in *Nature* **2006**, 439, 512.
- 19) Potuzak, J. S.; Moilanen, S. B.; Tan, D. S.* “Stereocontrolled synthesis of spiroketals via a remarkable methanol-induced kinetic spirocyclization reaction.” *J. Am. Chem. Soc.* **2005**, 127, 13796–13797.
- 18) Tan, D. S.* “Diversity-oriented synthesis: Exploring the intersections between chemistry and biology.” *Nature Chem. Biol.* **2005**, 1, 74–84 (Invited review).
- Highlighted in *Nature Chem. Biol.* **2005**, 1, 61.
- 17) Ferreras, J. A.; Ryu, J.-S.; Di Lello, F.; Tan, D. S.*; Quadri, L. E. N.* “Small molecule inhibition of siderophore biosynthesis in *Mycobacterium tuberculosis* and *Yersinia pestis*.” *Nature Chem. Biol.* **2005**, 1, 29–32.
- Highlighted in *Nature* **2005**, 435, 389; *Nature Chem. Biol.* **2005**, 1, 1; *Chem. Eng. News*, **2005**, 83(May 30), 13; *Mercosur Económico*, June 13, 2005.
- 16) DiBlasi, C. M.; Macks, D. E.; Tan, D. S.* “An acid-stable *tert*-butyldiarylsilyl (TBDAS) linker for solid-phase organic synthesis.” *Org. Lett.* **2005**, 7, 1777–1780.
- Highlighted in *Lett. Org. Chem.* **2005**, 2, 668–669.
- 15) Shang, S.; Tan, D. S.* “Advancing chemistry and biology through diversity-oriented synthesis of natural product-like libraries.” *Curr. Opin. Chem. Biol.* **2005**, 9, 248–258 (Invited review).

- 14) Moilanen, S. B.; Tan, D. S.* “Enantioselective synthesis of *erythro*-4-deoxyglycals as scaffolds for target- and diversity-oriented synthesis: New insights into glycal reactivity.” *Org. Biomol. Chem.* **2005**, *3*, 798–803.
- 13) Tan, D. S. “Current progress in natural product-like libraries for discovery screening.” *Comb. Chem. High-Throughput Screen.* **2004**, *7*, 631–643 (*Invited review*).
- 12) Potuzak, J. S.; Tan, D. S.* “Synthesis of C1-alkyl and C1-acylglycals from glycals using a B-alkyl Suzuki–Miyaura cross coupling approach.” *Tetrahedron Lett.* **2004**, *45*, 1797–1801.
- 11) Potuzak, J. S.; Moilanen, S. B.; Tan, D. S.* “Discovery and applications of small molecule probes for studying biological processes.” *Biotechnol. Genet. Eng. Rev.* **2004**, *21*, 11–78 (*Invited review*).
- 10) Tan, D. S. “Sweet surrender to chemical genetics.” *Nat. Biotechnol.* **2002**, *20*, 561–563 (*News & Views commentary*).

Postdoctoral, Graduate, and Undergraduate

- 9) Mandal, M.; Yun, H.; Dudley, G. B.; Lin, S.; Tan, D. S.; Danishefsky, S. J.* “Total synthesis of guanacastepene A: A route to enantiomeric control.” *J. Org. Chem.* **2005**, *70*, 10619–10637 (*Cover article*).
- 8) Tan, D. S.; Dudley, G. B.; Danishefsky, S. J.* “Synthesis of the functionalized tricyclic skeleton of guanacastepene A: A tandem epoxide-opening β -elimination/Knoevenagel cyclization.” *Angew. Chem. Int. Ed.* **2002**, *41*, 2185–2188.
- 7) Lin, S.; Dudley, G. B.; Tan, D. S.; Danishefsky, S. J.* “A stereoselective route to guanacastepene A through a surprising epoxidation.” *Angew. Chem. Int. Ed.* **2002**, *41*, 2188–2191.
- 6) Dudley, G. B.; Tan, D. S.; Kim, G.; Tanski, J. M.; Danishefsky, S. J.* “Remarkable stereoselectivity in the alkylation of a hydroazulenone: Progress toward the total synthesis of guanacastepene.” *Tetrahedron Lett.* **2001**, *42*, 6789–6791.
- 5) Tan, D. S.; Schreiber, S. L.* “A mercury-catalyzed transesterification cyclization leading to fused cyclic polyethers.” *Tetrahedron Lett.* **2000**, *41*, 9509–9513 (*Invited contribution to Special Issue in honor of Prof. Harry A. Wasserman*).
- 4) Tan, D. S.*; Burbaum, J. J.* “Ligand discovery using encoded combinatorial libraries.” *Curr. Opin. Drug Discovery Dev.* **2000**, *3*, 439–453 (*Invited review*).
- 3) Tan, D. S.; Foley, M. A.; Stockwell, B. R.; Shair, M. D.; Schreiber, S. L.* “Synthesis and preliminary evaluation of a library of polycyclic small molecules for use in chemical genetic assays.” *J. Am. Chem. Soc.* **1999**, *121*, 9073–9087.
- 2) Tan, D. S.; Foley, M. A.; Shair, M. D.; Schreiber, S. L.* “Stereoselective synthesis of over two million compounds having structural features both reminiscent of natural products and compatible with miniaturized cell-based assays.” *J. Am. Chem. Soc.* **1998**, *120*, 8565–8566.
 - Highlighted in *Science* **1998**, *282*, 2157–2161; *Chem. Eng. News*, **1999**, *77*(Jul 26), 44–46.
- 1) Tan, D. S.; Günter, M. M.; Drueckhammer, D. G.* “Enzymatic resolution coupled with substrate racemization using a thioester substrate.” *J. Am. Chem. Soc.* **1995**, *117*, 9093–9094.

BOOK CHAPTER

- 1) Tan, D. S. "Diversity-Oriented Synthesis." In *Chemical Biology*; Schreiber, S. L.; Kapoor, T. M.; Wess, G., Eds.; Wiley-VCH: Weinheim, Germany, 2007; Vol. 2, Ch. 9, pp 483–518.

PATENTS AND PATENT APPLICATIONS***Independent***

- 5) Tan, D. S.; Quadri, L. E. N.; Ryu, J.-S.; Cisar, J. S.; Ferreras, J. A.; Lu, X. "Anti-microbial agents and uses thereof." (a) **US Patent Appl. 11/911,525**, filed Oct 12, 2007; (b) **PCT Intl. Patent Appl. PCT/US2006/014,394**, filed Apr 14, 2006, published Oct 26, 2006 as WO/2006/113,615; (c) **US Prov. Patent Appl. 60/671,994**, filed Apr 15, 2005.
 - Highlighted in *Expert Opin. Ther. Patents* **2007**, 17, 221.
- 4) Tan, D. S.; DiBlasi, C. M.; Macks, D. E. "Linkers for solid phase organic synthesis." **US Prov. Patent Appl. 60/663,175**, filed Mar 18, 2005.

Graduate

- 3) Schreiber, S. L.; Shair, M. D.; Tan, D. S.; Foley, M. A.; Stockwell, B. R. "Synthesis of combinatorial libraries of compounds reminiscent of natural products." (a) **US Patent No. 7,109,377**, issued Sep 19, 2006; (b) **US Patent Appl. 10/185,364 (Cont.)**, filed Jun 27, 2002, published May 1, 2003 as US 2003/082,830.
- 2) Schreiber, S. L.; Shair, M. D.; Tan, D. S.; Foley, M. A.; Stockwell, B. R. "Synthesis of combinatorial libraries of compounds reminiscent of natural products." (a) **US Patent No. 6,448,443**, issued Sep 10, 2002; (b) **US Patent Appl. 09/121,922 (Cont.-in-part)**, filed Jul 25, 1998; (c) **PCT Intl. Patent Appl. PCT/US1999/016,753**, filed Jul 22, 1999, published Feb 10, 2000 as WO/2000/006,525.
- 1) Schreiber, S. L.; Shair, M. D.; Borchardt, A. J.; You, A. J.; Huang, J.; Foley, M.; Tan, D.; Whitesides, G.; Jackman, R. J. "Droplet assay system for screening combinatorial libraries." (a) **US Patent Appl. 08/951,930**, filed Oct 15, 1997; (b) **PCT Intl. Patent Appl. PCT/US1997/019,110**, filed Oct 15, 1997, published Apr 23, 1998 as WO/1998/016,830.

CONFERENCE ABSTRACTS (ORAL PRESENTATIONS)

- 2) Tan, D. S. "Following Nature's lead: New strategies for diversity-oriented synthesis." Presented at the 226th National Meeting of the American Chemical Society, New York, NY, September 2003; Paper ORGN 331.
- 1) Tan, D. S.; Foley, M. A.; Shair, M. D.; Schreiber, S. L. "Stereoselective synthesis of over two million compounds having structural features both reminiscent of natural products and compatible with miniaturized cell-based assays." Presented at the 216th National Meeting of the American Chemical Society, Boston, MA, August 1998; Paper ORGN 230.

INVITED SEMINARS

- | | |
|----------|---|
| 12/15/10 | Diversity-Oriented Synthesis Symposium, Pacificchem 2010, Honolulu, HI |
| 3/13/09 | St. Jude Children's Research Hospital, Dept. of Chemical Biology & Therapeut. |
| 2/9/09 | AACR-ACS Chemistry in Cancer Research Conference, New Orleans, LA |

Fall 2008 Colorado State University, Department of Chemistry

- 12/15/08 MSKCC, Department of Surgery, Research Conference Seminar Series
9/12/08 Eli Lilly, Surrey, UK
9/11/08 University of York, Department of Chemistry, UK
9/10/08 University College London, Department of Chemistry, UK
9/6/08 University of Cambridge, Department of Chemistry, UK
8/31/08 Gordon Research Conference, Combinatorial Chemistry, Oxford University, UK
8/29/08 University of Southampton, School of Chemistry, UK
2/26/08 University of Colorado, Boulder, Department of Chemistry and Biochemistry
- 12/11/07 Smith College, Department of Chemistry
11/13/07 Duke University, Department of Chemistry
10/10/07 ACS 41st Western Regional Meeting, San Diego, CA
7/28/07 2nd USA-UK Synthesis Workshop 'Young Guns II', San Francisco, CA
5/18/07 University of Pittsburgh, Department of Chemistry
4/27/07 University of Chicago, Department of Chemistry
3/30/07 Hamilton College, Department of Chemistry
3/8/07 SUNY Stony Brook, Department of Chemistry
2/14/07 Johns Hopkins School of Medicine, Dept. of Pharmacology & Mol. Sciences
2/8/07 UCLA, Department of Chemistry and Biochemistry
2/7/07 California Institute of Technology, Division of Chemistry & Chem. Engineering
2/1/07 University of Illinois at Urbana-Champaign, Department of Chemistry
1/12/07 The Scripps Research Institute, Department of Chemistry
- 12/4/06 Harvard University, Dept. of Chemistry & Chemical Biol., Eli Lilly Symposium
11/15/06 Yale University, Department of Chemistry
10/25/06 University of California, Irvine, Department of Chemistry
10/18/06 Wayne State University, Department of Chemistry
10/17/06 University of Michigan, Department of Chemistry
10/16/06 Pfizer Global Research & Development, Ann Arbor, MI
10/3/06 University of Wisconsin-Madison, Department of Chemistry
9/7/06 Columbia University, Department of Chemistry
8/2/06 Gordon Research Conference, Bioorganic Chemistry, Oxford University, UK
7/25/06 Eli Lilly, Indianapolis, IN
6/2/06 NSF Workshop on Organic Synthesis, Holderness, NH
5/26/06 PS183 5th Grade Science Workshop, MSKCC
5/17/06 University of Minnesota, Chemical Biology Initiative Workshop
4/28/06 Abbott Laboratories, Abbott Park, IL
3/24/06 City University of New York, Hunter College, Department of Chemistry
2/23/06 MSKCC, SKI Scientific Colloquium
- 11/8/05 University of Delaware, Chemistry-Biology Interface Seminar Series
10/21/05 University of Kansas, 11th Annual Chemical Biology Symposium (keynote)
8/24/05 Gordon Research Conference, Combinatorial Chemistry, Andover, NH
4/18/05 The Rockefeller University, Monday Lecture Series
3/28/05 University of Toledo, Department of Chemistry
3/3/05 MSKCC, Translational Research Seminar Series
- 12/08/04 IBC Target-Based Compound Libraries Symposium, San Diego, CA
5/13/04 Université de Montréal, Département de Chimie
3/09/04 City Univ. of New York, Queens College, Dept. of Chemistry and Biochemistry
- 11/15/03 Cornell Institute for Biology Teachers (keynote)
4/15/03 Cornell University, Weill Medical College, Department of Pharmacology
3/20/03 Cornell University, Department of Chemistry and Chemical Biology

3/14/03 City University of New York, Brooklyn College, Department of Biology
12/10/02 New York University, Department of Chemistry