

**CURRICULUM VITAE****GLENN D. PRESTWICH****Date and Place of Birth:** 29 November 1948, Panama Canal Zone; U.S. Citizen**Education**

B.S. (Honors), 1970. California Institute of Technology, Pasadena, California; Ph.D., Organic Chemistry, 1974.  
 Professor William S. Johnson, Advisor, Department of Chemistry, Stanford University, Palo Alto, California

**Professional Experience**

1974, 1977 Cornell University, NIH postdoctoral fellowship, Department of Chemistry  
 1974 – 1976 ICIPE, P.O. Box 30772, Nairobi, Kenya; Research Scientist in Chemistry Unit  
 1977 – 1996 Assistant, Associate, Full Professor of Chemistry, SUNY, Stony Brook, New York  
 1991 – 1992 Visiting Professor, Department of Chemistry, Harvard University  
 1992 – 1996 Professor of Biochemistry and Cellular Biology, SUNY, Stony Brook, New York  
 1992 – 1996 Director, Center for Biotechnology, SUNY, Stony Brook, New York  
 1996 – 2002 Chair, Medicinal Chemistry, The University of Utah  
 1996 – 2018 Research Professor of Biochemistry; Adjunct Professor of Chemistry and of Bioengineering  
 The University of Utah; Adjunct Professor of Biology (Utah State University, Logan, UT)  
 1996 – 2018 Presidential Professor, Medicinal Chemistry, The University of Utah (Emeritus 2018)  
 2001 – 2005 Chief Scientific Officer, Echelon Biosciences Incorporated, Salt Lake City, UT  
 2004 – 2005 Chief Scientific Officer, Sentrx Surgical, Inc., Salt Lake City, UT  
 2005 – 2007 Senior Scientific Advisor, Carbylan BioSurgery, Inc., Palo Alto, CA  
 2006 – 2011 Chief Scientific Officer, Glycosan BioSystems, Inc., Salt Lake City, UT  
 2006 – 2023 Scientific Advisor, Sentrx Animal Care, Inc., Salt Lake City, UT  
 2008 – current Scientific Advisor, Echelon Biosciences-Frontier Scientific, Salt Lake City, UT  
 2008 – current Chief Scientific Officer, GlycoMira, LLC and GlycoMira Therapeutics, Inc., Salt Lake City, UT  
 2011 – 2014 Scientific Advisor, BioTime, Inc., Alameda, CA  
 2012 – 2014 Chief Executive Officer, Metallosensors, Salt Lake City, UT  
 2015 - 2018 Chancellor's Distinguished Visiting Professor, Washington State University, WA  
 2014 - 2018 Manager, Deuteria Agrochemicals LLC, Reno, NV  
 2014 – 2022 Manager, Deuteria Biomaterials LLC, Reno, NV  
 2014 – current Adjunct Professor of Surgery, Divn. of Otolaryngology, University of Utah, UT (Emeritus)  
 2017 – 2019 Chief Scientific Officer and Executive VP, Chemistry, Symbic Bio, Inc.  
 2018 – 2021 President's Distinguished Professor, Washington State University (Emeritus 2022)  
 2020 – current President, Matrix Diagnostics Biosystems, Inc, Spokane, WA  
 2020 – 2022 Director, **sp<sup>3</sup>nw**, Spokane, WA  
 2020 – current Science & Innovation Advisor, HTL Biotechnology, Paris, France  
 2021 – current Vice President, Maana Discoveries, Inc., Missoula, MT

**Professional Affiliations and Interests***Co-founder*

Clear Solutions Biotech, Inc.; Echelon Biosciences Inc.; Sentrx Surgical, Inc.; Carbylan BioSurgery, Inc.;  
 Glycosan BioSystems, Inc.; Sentrx Animal Care, Inc.; Clear Solutions Biomedical LLC; GlycoMira, LLC;  
 GlycoMira Therapeutics, Inc.; Metallosensors, Inc.; Deuteria Agrochemicals LLC; Deuteria Biomaterials  
 LLC; Matrix Diagnostics Biosystems, Inc.; Maana Discoveries, Inc.

*Other Administrative and Advisory Roles*

Director, Center for Cell Signaling (1997-2004) and Center for Therapeutic Biomaterials (2004-08); SAB,  
 Tissue Engineering Center, CCF (2004-10); VP, International Society for Hyaluronan Science (2004-08);  
 SAB, Novozymes Biopolymers (2006-11); SAB, Sorenson Discovery & Innovation Center (2007-11); SAB,  
 Organovo, Inc. (2007-16); SAB, Inst. Systems Biol. & Ecol., Czech Academy of Sciences (2007-11); Chair,  
 Advisory Board, National Center for Voice and Speech (2010-13); SAB, BOD, Brickell Biotech (2010-13); AB,  
 Modern Meadow, Inc. (2012-17) AB, Jade Therapeutics, Inc./Eyegate, Inc. (2012-16); AB, American Med  
 Chem (2013-18); AB, Asha Therapeutics (2013 - ); SAB, Symbic Bio (2014-17); SAB, Amasa Therapeutics,  
 (2016 - ); Advisor, Shasqi, Inc. (2017- ); Advisor, C-DOCTOR (2019 -); Advisor, Valitor (2019 -); Advisor,  
 Rebel Medicine (2019 -); Advisor, Glycologix (2022 -); Advisor, IHP Therapeutics (2022 -)

*Research Interests*

Phosphoinositide and lysolipid signaling, therapeutic biomaterials; anti-inflammatory GAGs

*Courses Taught*

Bioorganic Chemistry; Structural Organic Chemistry; Introductory, Honors and Intermediate  
 Organic Chemistry, Chemical Ecology; Medicinal Chemistry; Site-Targeted Drug Delivery

## **Awards and Honors**

National Institutes of Health Postdoctoral Fellow, 1976-1977; National Institutes of Health Senior Fellowship, 1992  
Alfred P. Sloan Foundation Research Fellow, 1981-1985; Camille and Henry Dreyfus Teacher-Scholar, 1981-1986  
Distinguished Research Fellow, Bodega Marine Laboratory, University of California, 1989  
H.C. Brown Lecturer, Purdue University, March 1990  
Paul Dawson Biotechnology Award, American Association of Colleges of Pharmacy, 1998  
Silverstein-Simeone Award of the International Society of Chemical Ecology, 2001  
Stoel Rives Utah Innovation Awards (Echelon Biosciences, 2003; Sentrx Surgical, 2005)  
Fellow of the American Institute for Medical and Biological Engineering, 2005 - current  
Governor's Medal for Science & Technology, 2006  
VSpring Capital Top 100 Entrepreneurs, 2005, 2006  
TIAA-CREF 'Greater Good Award' for 2006-2007  
Utah Business Magazine's "Health Care Heroes," 2006  
Volwiler Research Award, American Association of Colleges of Pharmacy, 2008  
Rooster Prize for Therapeutic uses of Hyaluronan, International Society for Hyaluronan Science, 2010  
University of Utah Distinguished Scholarly and Creative Research Award, 2010  
Fellow of the National Academy of Inventors, 2013 - current  
University of Utah Distinguished Innovation and Impact Award, 2014  
Fellow, American Association for Advancement of Science, 2018 – current

**Invited Presentations:** Dr. Prestwich has presented over 680 invited talks; the past 10 years are listed below.

- 2011** Rice University, Workshop on 3D Cell Culture, 10 February  
15<sup>th</sup> International Symposium on Recent Advances in Drug Delivery Systems, Salt Lake, 13-16 February  
University of Georgia, College of Pharmacy, Athens, 1 March  
Complex Carbohydrate Research Center, Athens, 2 March  
Symposium Co-organizer and Plenary Speaker, Society for Biomaterials, Orlando, 13-16 April  
Australasian Society for Biomaterials & Tissue Engineering, Queenstown, New Zealand, 27-29 April  
Johnson-Sokatch Lecturer, University of Oklahoma, 11-12 May  
OKBio Lecture, Oklahoma University Health Sciences Center, 12 May  
Changchun Institute for Applied Chemistry, Chinese Academy of Sciences, 27 May  
International Symposium on Biomaterials, Giulini City, China, 29 May – 1 June  
Case Western Reserve University, 4<sup>th</sup> Annual Business of Regenerative Medicine Course, Cleveland, 11-13 July  
European Society for Biomaterials, Dresden, Germany, 1-2 September  
Pharmacy Alumni Advisory Committee, University of Utah, 6 October 2011  
University of Nebraska, Department of Biochemistry and Redox Biology Center, Lincoln, 11 October  
Plenary Keynote Lecturer, GTC Modern Drug Design and Development, San Diego, 19 October  
Panelist, Modern Devices, Drugs and Delivery Summit, Salt Lake City, 26 October  
Children's Hospital of Oakland Research Institute, Distinguished Lecture, Oakland, 6 December  
Nano Today, Waikoloa, Hawaii, 11-15 December
- 2012** University of Texas, Austin, Department of Bioengineering, Austin, 2 February  
Translational Medicine Symposium, U of Utah, Salt Lake City, Co-organizer, speaker, 7 February  
Material Research Society Symposium, San Francisco, 12-15 April  
GTC 8<sup>th</sup> Stem Cell Summit, Boston, 19,20 April  
US-Canada Workshop on Commercialization, Universities of Calgary, Waterloo, and Montreal, 10-15 June  
Advanced Functional Polymers for Medicine, Vico Equense, Italy, 2-6 July  
Case Western Reserve University, 5<sup>th</sup> Annual Business of Regenerative Medicine Course, Cleveland, 14-16 July  
Washington State University, College of Arts & Sciences, Bench to Business, 5 October  
Commercialization Interchange, U of Utah, 17-19 October  
GTC Modern Drug Discovery & Development Summit, Keynote, Philadelphia, 24,25 October  
New Jersey Symposium on Biomaterials Science at Rutgers U, New Brunswick, 13-15 October  
BioTime, Inc., videotaped seminar series on Clinical Biomaterials, Alameda, CA 19 November
- 2013** University of California San Francisco, 14-15 January  
Translational Medicine Symposium, U of Utah, Salt Lake City, Co-organizer, speaker, 19 February  
Executive Summit, Lassonde Center, Salt Lake City, UT 21-23 February  
University of Georgia, College of Pharmacy, Athens, 5 March  
Carnegie Mellon University-McGowan Institute Annual Retreat, 8 March  
Washington State University, NIH Protein Technology Training Grant Keynote Talk, 13 April  
HA 2013, co-organizer and speaker, University of Oklahoma, Oklahoma City, OK, 5-9 June  
Case Western Reserve University, 6<sup>th</sup> Annual Business of Regenerative Medicine Course, Cleveland, 15-18 July  
University of Utah, Department of Surgery Grand Rounds, 8 August  
McGowan Institute for Regenerative Medicine, 9 October  
Commercialization Interchange, U of Utah, 14-15 October  
Penn State University Medical Center, Keynote for Awards Dinner, 22 October
- 2014** University of California, Riverside, Bioengineering, 22 January  
Translational Medicine Symposium, U of Utah, Salt Lake City, Co-organizer, speaker, 11 February  
University of Illinois, Urbana-Champaign, Chemical & Biomolecular Engineering, 20 March  
Biomaterials for Biomolecule Delivery, Materials Research Society, San Francisco, 21-25 April  
Penn State University Medical Center, Hershey, Keynote for Faculty Entrepreneur launch, 29 April 16, 2014  
Intellectual Ventures, Seattle, 7 May  
Gordon Research Conference on Proteoglycans, Andover, New Hampshire, 8-11 July  
Case Western Reserve University, 7<sup>th</sup> Annual Business of Regenerative Medicine Course, Toronto, 14-17 July  
Skaggs Symposium, Missoula, MT, 14 August  
Commercialization of Micro and Nanotechnologies Symposium (COMS), Salt Lake City, 13 October  
Commercialization Interchange, Midway and U of Utah, 14-16 October  
Rotary Club of Salt Lake, 2 December
- 2015** National Cancer Institute, Frederick, MD, 22 January

University of Texas San Antonio Health Sciences Center, 13 April  
Hong Kong University of Science & Technology, Keynote, 20-23 April  
HA 2015, co-organizer and speaker, Firenze, Italy 7-11 June  
Rutgers University, Faculty Ambassadors, 22-24 June  
Commercialization Interchange, Salt Lake City, New Brunswick, NJ 13-15 October  
Hong Kong University of Science & Technology, Entrepreneurship Talk, 8 October  
Alliance for Arts in Research Universities, Workshop, Va6-8 November

- 2016** Washington State University, Pullman, WA Launch of Entrepreneurial Faculty Ambassadors, 19 January  
University of Montana, Biomedical Engineering & Entrepreneurship, Missoula, MT 24-25 March  
Assoc for Research in Vision & Ophthalmology, Intellectual Property Symposium, Seattle, 30 April  
Translate! 2016, speaker/moderator, Berlin, Germany, 23-27 May  
Gordon Research Conference on Proteoglycans, 10-15 July  
UC Irvine Innovation Center, Entrepreneurship and Translational Medicine, 29 July  
Moving Forward with Stem Cell Therapy, EuroCon web seminar, 6 September  
Commissioned Sounds of Science's "Reaction Yield" by Third Coast Percussion, 8 October premiere, Chicago  
Led External Review of Innovation and Entrepreneurship team, WSU Pullman and Spokane, 7-9 Nov
- 2017** Leadership Retreat invitee, Mayo Clinic Executive Dean for Research, Tucson, AZ 12-13 February  
Translational Medicine Symposium, U of Utah, Salt Lake City, Co-organizer, speaker, 27 February  
Cornell University, BEST Program, College of Veterinary Medicine, Ithaca, NY 22 May  
HA 2017, Session organizer and speaker, Cleveland Clinic, OH 11-15 June  
90<sup>th</sup> Birthday Celebration for Jerrold Meinwald, ISCE, Kyoto, Japan, 22 August
- 2018** Health Sciences Entrepreneur Lecturer, University of Utah, 31 January  
ACS Symposium on Frontiers in Glycoscience, 18 March  
Proteoglycans Gordon Conference, Entrepreneurship Power Hour, 8-13 July
- 2019** University of Nottingham, Biomaterials Discovery Workshop, 16 January  
Manchester University, Wellcome Center for Cell Matrix Research, 18 January  
Induction Ceremony, AAAS Fellows, 16 February  
Brigham Young University, Bioengineering, 22 February  
University of North Carolina, Dentistry, Biology 9-10 April  
Michigan State University, Chemistry, 12 April  
Stanford University, SPARK, Bioengineering, Medicine, 22-23 April  
HA 2019, Cardiff, Wales, 9-13 June  
University of Virginia, Bioengineering, 29 October
- 2020** Inland NW Students (AWIS/GRSA), WSU Spokane, 13 February  
Biomaterials WBC 2020, Keynote, HA Symposium, 12-17 December
- 2021** Translate! Berlin, Invited Panelist, online, 25-26 January  
Biologic Scaffolds Regenerative Medicine, Napa, CA April 28-May 4  
Third Annual Drug Delivery West, online, 7-8 May  
Basement Membrane Extract Replacement Symposium/Webinar, online, 21 October
- 2022** Southeastern University, College of Natural & Health Sciences, 17 March  
Proteoglycans Gordon Conference, Session Chair, 13-17 July
- 2023** SC BioCraft, Clemson-MUSC, 16 March  
HA 2023 Portland, 3-9 June  
12<sup>th</sup> International Proteoglycan Conference, Horsley, UK 4-6 September  
Pharmaceutics Students, U Utah, 25 September

## Publications of Original Research

1. G.D. Prestwich, "I. Solvolysis of *trans*-9-Methyl-5,9-undecadienyl and *trans*-Undec-5-en-9-ynyl *para*-Nitrobenzene Sulfonates. II. The Total Synthesis of *dl*-Serratenediol via a Cationic Polyolefinic Cyclization," Ph.D. Dissertation, Stanford University, 1974.x
2. G.D. Prestwich and J.N. Labovitz, "Application of Nonenzymic Biogenetic-like Olefinic Cyclizations to the Total Synthesis of *dl*-Serratenediol," *J. Am. Chem. Soc.*, **96**, 7103-7105 (1974).
3. G.D. Prestwich, "Chemical Analysis of Soldier Defensive Secretions Species of East African Termites," *Proc. IUSSI Symp.* (Dijon), pp 149-152 (1975).
4. G.D. Prestwich, M. Kaib, W.F. Wood, and J. Meinwald, "1,13-Tetradecadien-3-one and Homologs: New Natural Products Isolated from *Schedorhinotermes* Soldiers," *Tetrahedron Lett.*, 4701-4704 (1975).
5. W.F. Wood, M.G. Leahy, R. Galun, G.D. Prestwich, J. Meinwald, R.E. Purnell, and R.C. Payne. "Phenols as Sex Pheromones of Ixodid Ticks: A General Phenomenon?," *J. Chem. Ecol.*, **1**, 501-509 (1975).
6. G.D. Prestwich, F.B. Whitfield, and G. Stanley, "Synthesis and Structures of Dihydroedulan I and II: Trace Components from the Juice of *Passiflora edulis* Sims," *Tetrahedron*, **32**, 2945-2948 (1976).
7. G.D. Prestwich, "Composition of the Scents of Eight East African Hemipterans. Nymph-Adult Chemical Polymorphism in Coreids," *Ann. Entomol. Soc. Am.*, **69**, 812-814 (1976).
8. G.D. Prestwich, S.P. Tanis, J.P. Springer, and J. Clardy, "Nasute Termite Soldier Frontal Gland Secretions. I. Structure of Trinervi-2 $\beta$ ,3 $\alpha$ ,9 $\alpha$ -triol 9-*O*-Acetate, a Novel Diterpene from *Trinervitermes* Soldiers," *J. Am. Chem. Soc.*, **98**, 6061-6062 (1976).
9. G.D. Prestwich, S.P. Tanis, F. Pilkiewicz, I. Miura, and K. Nakanishi, "Nasute Termite Soldier Frontal Gland Secretions. II. Structures of Trinervitene Congeners from *Trinervitermes* Soldiers," *J. Am. Chem. Soc.*, **98**, 6062-6064 (1976).
10. G.D. Prestwich, "Chemical Composition of the Soldier Secretions of the Termites *Trinervitermes graciosus*," *Insect Biochem.* **7**, 91-94 (1977).
11. G.D. Prestwich, B.A. Bierl, E.D. DeVilbiss, and M.F.B. Chaudhury, "Soldier Frontal Glands of the Termite *Macrotermes subhyalinus*: Morphology, Chemical Composition, and Use in Defense," *J. Chem. Ecol.*, **3**, 579-590 (1977).
12. G.D. Prestwich, B.A. Solheim, J. Clardy, F.G. Pilkiewicz, I. Miura, S.P. Tanis, and K. Nakanishi, "Kempene-1 and -2, Unusual Tetracyclic Diterpenes from *Nasutitermes* Termite Soldiers," *J. Am. Chem. Soc.*, **99**, 8082-8083 (1977).

13. G.D. Prestwich, D.F. Wiemer, J. Meinwald, and J. Clardy, "Cubitene: An Irregular Twelve-Membered-Ring Diterpene from a Termite Soldier" *J. Am. Chem. Soc.*, **100**, 2560-2561 (1978).
14. G.D. Prestwich, "Isotrinervi-2 $\beta$ -ol. Structural Isomers in the Defense Secretions of Allopatric Populations of the Termite *Trinervitermes gratiosus*," *Experientia*, **34**, 682-683 (1978).
15. J. Meinwald, G.D. Prestwich, K. Nakanishi, and I. Kubo, "Chemical Ecology: Studies from East Africa," *Science*, **199**, 1167-1173 (1978).
16. G.D. Prestwich, "Termites: Dweller in the Dark," *National Geographic*, **153**, 532-547 (April 1978).
17. D.F. Wiemer, J. Meinwald, G.D. Prestwich, and I. Miura, "Cembrene A and (3*Z*)-Cembrene A: Diterpenes from a Termite Soldier (Isoptera:Termitidae: Termitinae)," *J. Org. Chem.*, **44**, 3950-3952 (1979).
18. G.D. Prestwich, "Interspecific Variation in the Defence Secretions of *Nasutitermes* Soldiers," *Biochem. Syst. Ecol.*, **7**, 211-221 (1979).
19. G.D. Prestwich, "Defence Secretion of the Black Termite, *Grallatotermes africanus* (Termitidae, Nasutitermitinae)," *Insect Biochem.*, **9**, 563-567 (1979).
20. G.D. Prestwich, J.W. Lauher, and M.S. Collins, "Two New Tetracyclic Diterpenes from the Defense Secretion of the Neotropical Termites *Nasutitermes octopilis*," *Tetrahedron Lett.*, 3827-3830 (1979).
21. G.D. Prestwich, "Las Termitas: El Increible Mundo de Milliones de Seres Ciegos, Sordos y Mudos," *GeoMundo*, **2**, 704-720 (January 1979).
22. G.D. Prestwich, "Chemical Defense by Termite Soldiers," *J. Chem. Ecol.*, **5**, 459-480 (1979).
23. G.D. Prestwich, "Termite Chemical Defense: New Natural Products and Chemosystematics," *Sociobiology*, **4**, 127-138 (1979).
24. G.D. Prestwich and J. Vrkoc, "Standard Nomenclature for Termite Diterpenes," *Sociobiology*, **4**, 139-140 (1979).
25. D.F. Wiemer, J. Meinwald, G.D. Prestwich, B.A. Solheim, and J. Clardy, "Biflora-4,10(19),15-triene: A New Diterpene from a Termite Soldier (Isoptera: Termitidae: Termitinae)," *J. Org. Chem.*, **45**, 191-192 (1980).
26. G.D. Prestwich, S.G. Spanton, J.W. Lauher, and J. Vrkoc, "Structure of 3 $\alpha$ -Hydroxy-15-rippertene. Evidence for a 1,2-Methyl Migration During Biogenesis of a Tetracyclic Diterpene in Termites," *J. Am. Chem. Soc.*, **102**, 6825-6828 (1980).
27. G.D. Prestwich, K.A. Plavcan, and M. Melcer, "Synthesis of Fluorolipids: 1-*O*-Alkyl-2,3-*O*-Diacylglycerides as Targeted Insecticides," *J. Agric. Food Chem.*, **29**, 1018-1022 (1981).

28. G.D. Prestwich, M.E. Melcer, K.A. Plavcan, "Fluorolipids as Targeted Termiticides and Biochemical Probes," *J. Agric. Food Chem.*, **29**, 1023-1027 (1981).
29. G.D. Prestwich, B.L. Bentley, and E.J. Carpenter, "Nitrogen Sources of Neotropical Nasute Termites: Fixation and Selective Foraging," *Oecologia*, **46**, 397-401 (1980).
30. G.D. Prestwich and D. Chen, "Soldier Defense Secretions of *Trinervitermes bettonianus* (Isoptera, Nasutitermitinae): Chemical Variation in Allopatric Populations," *J. Chem. Ecol.*, **7**, 147-157 (1981).
31. G.D. Prestwich, S.H. Goh, and Y.P. Tho, "Termite Soldier Chemotaxonomy. A New Diterpene from Malaysian Nasute Termite *Bulbitermes singaporensis*," *Experientia*, **37**, 11-12 (1981).
32. G.D. Prestwich and M.S. Collins, "Chemotaxonomy of *Subulitermes* and *Nasutitermes* Termite Soldier Defense Secretions. Evidence Against the Hypothesis of Diphyletic Evolution of the Nasutitermitinae," *Biochem. Syst. Ecol.*, **9**, 83-88 (1981).
33. G.D. Prestwich, S.G. Spanton, S.H. Goh, and Y.P. Tho, "New Tricyclic Diterpene Propionate Esters from a Termite Soldier Defense Secretion," *Tetrahedron Lett.* **22**, 1563-1566 (1981).
34. G.D. Prestwich, R.W. Jones, and M.S. Collins, "Terpene Biosynthesis by Nasute Termite Soldiers (Isoptera: Nasutitermitinae)," *Insect Biochem.*, **11**, 331-336 (1981).
35. G.D. Prestwich and M.S. Collins, "A Novel Enolic  $\beta$ -Ketoaldehyde in the Defense Secretion of the Termite *Rhinotermes hispidus*," *Tetrahedron Lett.*, **21**, 5001-5002 (1980).
36. G.D. Prestwich and B.L. Bentley, "Nitrogen Fixation by Intact Colonies of the Termite *Nasutitermes corniger*," *Oecologia*, **49**, 249-251 (1981).
37. G.D. Prestwich and M.S. Collins, "3-Oxo-(Z)-9-Hexadecenal: An Unusual Enolic  $\beta$ -Keto Aldehyde from a Termite Soldier Defense Secretion," *J. Org. Chem.*, **46**, 2383-2385 (1981).
38. H.-M. Shieh and G.D. Prestwich, "Stereoselective Alkylation and Aldol Reactions of (S)-(-)- $\beta$ -Hydroxy- $\gamma$ -butyrolactone Dianion," *J. Org. Chem.*, **46**, 4319-4321 (1981).
39. G.D. Prestwich and M.S. Collins, "Macrocyclic Lactones as the Defense Substances of the Termite Genus *Armitermes*," *Tetrahedron Lett.*, **22**, 4587-4590 (1981).
40. S.G. Spanton and G.D. Prestwich, "Chemical Self-Defense by Termite Workers: Prevention of Autotoxication in Two Rhinotermitids," *Science*, **214**, 1363-1365 (1981).
41. G.D. Prestwich and M.S. Collins, "Chemical Defense Secretions of the Termite Soldiers of *Acorhinotermes* and *Rhinotermes* (Isoptera, Rhinotermitinae): Ketones, Vinyl Ketones, and  $\beta$ -Ketoaldehydes Derived from Fatty Acids," *J. Chem. Ecol.*, **8**, 147-161 (1982).
42. G.D. Prestwich, "From Tetracycles to Macrocycles: Chemical Diversity in the Defense Secretions of Nasute Termites," *Tetrahedron*, Symposium-in-Print, **38**, 1911-1919 (1982).

43. S.G. Spanton and G.D. Prestwich, "Chemical Defense and Self-Defense: Biochemical Transformations of Contact Insecticides Produced by Soldier Termites," *Tetrahedron*, Symposium-in-Print, **38**, 1921-1930 (1982).
44. J.F. Carvalho and G.D. Prestwich, "Evidence for Stereoselective Lipolysis in a Termite. Toxicity of Enantiomeric  $\omega$ -Fluorinated Alkyldiacylglycerols to *Reticulitermes flavipes*," *Insect Biochem.*, **12**, 343-348 (1982).
45. G.D. Prestwich, G.E. Kovalick, and J.K. Koeppe, "Photoaffinity Labelling of Juvenile Hormone Binding Proteins in the Cockroach *Leucophaea maderae*," *Biochem. Biophys. Res. Commun.*, **107**, 966-973 (1982).
46. G.D. Prestwich, "Termite Soldiers: Warriors with Chemical Weapons," *The Science Teacher*, **49**, 50-53 (1982).
47. G.D. Prestwich, "The Total Termite," *The Science Teacher*, **49**, 29-33 (1982).
48. T.B. Kline and G.D. Prestwich, "Side Chain Modified Sterols as Probes into Insect Molting Hormone Metabolism. I. Synthesis of Monofluorophytosterols," *Tetrahedron Lett.*, **23**, 3043-3046 (1982).
49. G.D. Prestwich and B.L. Bentley, "Ethylene Production by the Fungus Comb of Macrotermitines (Isoptera, Termitidae): A Caveat for the Use of the Acetylene Reduction Assay for Nitrogenase Activity," *Sociobiology*, **7**, 145-152 (1982).
50. Y. Naya, G.D. Prestwich, and S.G. Spanton, "Sesquiterpenes from Termite Soldiers. Structure of Amiteol, A New  $5\beta$ ,  $7\beta$ ,  $10\beta$  Eudesmane from *Amitermes excellens*," *Tetrahedron Lett.*, **23**, 3047-3050 (1982).
51. H.-M. Shieh and G.D. Prestwich, "Chiral, Biomimetic Total Synthesis of (-)-Aplysistatin," *Tetrahedron Lett.*, **23**, 4643-4646 (1982).
52. M.S. Collins and G.D. Prestwich, "Defense in *Nasutitermes octopilis* Banks (Isoptera, Termitidae, Nasutitermitinae): Comparative Effectiveness of Soldier Secretion," *Insectes Sociaux*, **30**, 70-81 (1983).
53. G.D. Prestwich, J.K. Mauldin, J.B. Engstrom, J.F. Carvalho, and D.Y. Cupo, "Comparative Toxicity of Fluorinated Lipids and Their Evaluation as Bait-Block Toxicants for the Control of *Reticulitermes* spp. (Isoptera: Rhinotermitidae)," *J. Econ. Entomol.*, **76**, 690-695 (1983).
54. G.D. Prestwich, H.-M. Shieh, and A.K. Gayen, "Side Chain Modified Sterols as Probes into Insect Molting Hormone Metabolism. II. Synthesis of Monofluorocholesterols," *Steroids*, **41**, 79-94 (1983).
55. G.D. Prestwich, "The Chemical Defenses of Termites," *Scientific American*, pp. 78-87 (August 1983).
56. G.D. Prestwich and S. Phirwa, "Synthesis of 29-Fluorophytosterols: A Novel Class of Insect-Activated Selective Poisons," *Tetrahedron Lett.*, **24**, 2461-2464 (1983).



57. G.D. Prestwich, A.K. Singh, J.F. Carvalho, J.K. Koeppe, and G.E. Kovalick, "Photoaffinity Labels for Insect Juvenile Hormone Binding Proteins: Synthesis and Evaluation *In Vitro*" *Tetrahedron*, Symposium-in-Print, **40**, 529-537 (1984).
58. C.H. Chuah, S.H. Goh, G.D. Prestwich, and Y.P. Tho, "Soldier Defense Secretions of the Malaysian Termite *Hospitalitermes umbrinus* (Isoptera, Nasutitermitinae)," *J. Chem. Ecol.*, **9**, 347-356 (1983).
59. S.H. Goh, C.H. Chuah, Y.P. Tho, and G.D. Prestwich, "Extreme Intraspecific Chemical Variability in Soldier Defense Secretions of Allopatric and Sympatric Colonies of *Longipeditermes longipes*," *J. Chem. Ecol.*, **10**, 929-944 (1984).
60. J.K. Koeppe, G.E. Kovalick, and G.D. Prestwich, "A Specific Photoaffinity Label for Hemolymph and Ovarian Juvenile Hormone-binding Proteins in *Leucophaea maderae*," *J. Biol. Chem.*, **259**, 3219-3223 (1984).
61. G.D. Prestwich, A.K. Gayen, S. Phirwa, and T.B. Kline, "29-Fluorophytosterols: Novel Pro-insecticides Which Cause Death by Dealkylation," *Bio/Technology*, **1**, 62-65 (1983).
62. J.F.A. Traniello, B.L. Thorne, and G.D. Prestwich, "Chemical Composition and Efficacy of the Cephalic Gland Secretion of *Armitermes chagresi* (Isoptera: Termitidae)," *J. Chem. Ecol.*, **10**, 531-543 (1984).
63. J.F. Carvalho and G.D. Prestwich, "Synthesis of  $\omega$ -Tritiated and  $\omega$ -Fluorinated Analogues of the Trail Pheromone of Subterranean Termites," *J. Org. Chem.*, **49**, 1251-1258 (1984).
64. G.D. Prestwich, W.-s. Eng, R.M. Roe, and B.D. Hammock, "Synthesis and Bioassay of Isoprenoid 3-Alkylthio-1,1,1-trifluoro-2-propanones: Potent, Selective Inhibitors of Juvenile Hormone Esterase," *Arch. Biochem. Biophys.*, **228**, 639-645 (1984).
65. G.D. Prestwich, "Interspecific Variation of Diterpene Composition of *Cubitermes* Soldier Defense Secretions," *J. Chem. Ecol.*, **10**, 1219-1231 (1984).
66. G.D. Prestwich, R. Yamaoka, S. Phirwa, and A. De Palma, "Isolation of 2-Fluorocitrate Produced by *In Vivo* Dealkylation of 29-Fluorostigmasterol in an Insect," *J. Biol. Chem.*, **259**, 11022-11026 (1984).
67. M.S. Tempesta, J.K. Pawlak, T. Iwashita, Y. Naya, K. Nakanishi, and G.D. Prestwich, "Cubugene: A Diterpenoid with a Novel Carbon Skeleton from a Termite Soldier (Isoptera, Termitidae, Termitinae)" *J. Org. Chem.*, **49**, 2077-2079 (1984).
68. G.D. Prestwich, W.-s. Eng, E. Deaton, and D. Wichern, "Structure-Activity Relationships Among Aromatic Analogs of the Trail-following Pheromone of Subterranean Termites," *J. Chem. Ecol.*, **10**, 1201-1217 (1984).
69. G.D. Prestwich, M.S. Tempesta, and C. Turner, "Longipenol, a Novel Tetracyclic Diterpene from the Termite Soldier *Longipeditermes longipes*," *Tetrahedron Lett.*, **25**, 1531-1532 (1984).

70. G.D. Prestwich, F.A. Golec, and N.H. Andersen, "Synthesis of a Highly Tritiated Photoaffinity Labeled Pheromone Analog for the Moth *Antheraea polyphemus*," *J. Labelled Compd. Radiopharm.*, **21**, 593-601 (1984).
71. J.K. Koeppe, G.D. Prestwich, J.J. Brown, W.G. Goodman, G.E. Kovalick, T. Briers, M.D. Pak, and L.I. Gilbert, "Photoaffinity Labeling of the Hemolymph Juvenile Hormone Binding Protein of *Manduca sexta*," *Biochemistry*, **23**, 6674-6679 (1984).
72. E.S. Chang, M.A. Bruce, and G.D. Prestwich, "Further Characterization of the Juvenile Hormone Binding Protein from the Cytosol of a *Drosophila* Cell Line: Use of a Photoaffinity Label," *Insect Biochem.*, **15**, 197-204 (1985).
73. G.D. Prestwich, I. Lucarelli, S.-K. Park, D.N. Loury, D.E. Moody, and B.D. Hammock, "Cyclopropyl Oxiranes: Reversible Inhibitors of Cytosolic and Microsomal Epoxide Hydrolases," *Arch. Biochem. Biophys.*, **237**, 361-372 (1985).
74. G.D. Prestwich, R. Yamaoka, and J.F. Carvalho, "Metabolism of Tritiated  $\omega$ -Fluorofatty Acids and Alcohols in the Termite *Reticulitermes flavipes* (Kollar) (Isoptera, Rhinotermitidae)," *Insect Biochem.*, **15**, 205-209 (1985).
75. T.J. Gush, B.L. Bentley, G.D. Prestwich, and B.L. Thorne, "Chemical Variation in Defensive Secretions of Four Species of *Nasutitermes* ," *Biochem. Syst. Ecol.*, **13**, 329-336 (1985).
76. G.D. Prestwich and B.D. Hammock, "Rapid Purification of Cytosolic Epoxide Hydrolase from Normal and Clofibrate-treated Mice by Affinity Chromatography," *Proc. Natl. Acad. Sci. USA*, **82**, 1663-1667 (1985).
77. G.D. Prestwich, R.G. Vogt, and L.M. Riddiford, "Binding and Hydrolysis of Radiolabeled Pheromone and Several Analogs by Male-specific Antennal Proteins of the Moth *Antheraea polyphemus*," *J. Chem. Ecol.*, **12**, 323-333 (1986).
78. R.G. Vogt, L.M. Riddiford, and G.D. Prestwich, "The Kinetic Properties of a Pheromone Degrading Enzyme: The Sensillar Esterase of *Antheraea polyphemus*," *Proc. Natl. Acad. Sci. USA*, **82**, 8827-8831 (1985).
79. G.D. Prestwich, J.-w. Kuo, S.-K. Park, D.N. Loury, and B.D. Hammock, "Inhibition of Epoxide Metabolism by  $\alpha,\beta$ -Epoxyketones and Isosteric Analogs," *Arch. Biochem. Biophys.*, **242**, 11-15 (1985).
80. G.D. Prestwich, M. Angelastro, A. De Palma, and M.A. Perino, "Fucosterol Epoxide Lyase of Insects: Synthesis of Labeled Substrates and Development of a Partition Assay," *Analyt. Biochem.* **151**, 315-326 (1985).
81. G.D. Prestwich and C. Wawrzenczyk, "High Specific Activity Enantiomerically Enriched Juvenile Hormones: Synthesis and Binding Assay," *Proc. Natl. Acad. Sci. USA*, **82**, 5290-5294 (1985).

82. B.D. Hammock, G.D. Prestwich, D.N. Lounsbury, P.K. Cheung, W.-s. Eng, S.-K. Park, D.E. Moody, and M.H. Silva, "Comparison of Crude and Affinity-Purified Cytosolic Epoxide Hydrolase from Hepatic Tissue of Control and Clofibrate-Fed Mice," *Arch. Biochem. Biophys.*, **244**, 292-309 (1986).
83. Y.-S. Ding and G.D. Prestwich, "Metabolic Transformations of Tritium-Labeled Pheromone by Tissues of *Heliothis virescens* Moths," *J. Chem. Ecol.*, **12**, 411-429 (1986).
84. G.D. Prestwich, "Molecular Communication of Insects," *Quart. Rev. Biol.*, **60**, 437-456 (1985).
85. A.K. Singh and G.D. Prestwich, "Synthesis of Tritium-Labeled Cembrene-A," *J. Labelled Compd. Radiopharm.*, **23**, 377-382 (1986).
86. G.D. Prestwich, "Fluorinated Sterols, Hormones, and Pheromones: Enzyme-Targeted Disruptants in Insects," *Pestic. Sci.*, **37**, 430-440 (1986).
87. G.D. Prestwich, S. Robles, C. Wawrzencyk, and A. Bühler, "Hemolymph JH-Binding Proteins of Lepidopterous Larvae: Enantiomeric Selectivity and Photoaffinity Labeling," *Insect Biochem.*, **17**, 551-560 (1987).
88. G.D. Prestwich, J.F. Carvalho, Y.-S. Ding, and D.E. Hendricks, "Acyl Fluorides as Reactive Mimics of Aldehyde Pheromones: Hyperactivation and Aphrodisia in *Heliothis virescens* ," *Experientia*, **42**, 964-966 (1986).
89. W.-s. Eng and G.D. Prestwich, "Synthesis of Radiolabeled Juvenile Hormone Analogs and Chiral Homologs," *Bull. Soc. Chim. Belg.*, **95**, 895-914 (1986).
90. M.F. Boehm and G.D. Prestwich, "Synthesis of Radioiodinated Juvenile Hormone Analogs," *J. Org. Chem.*, **51**, 5447-5450 (1986).
91. G.D. Prestwich, W.-s. Eng, M.F. Boehm, and C. Wawrzencyk, "High Specific Activity Tritium- and Iodine-Labeled JH Homologs and Analogs for Receptor Binding Studies," *Insect Biochem.*, **17**, 1033-1037 (1987).
92. J.R. Wisniewski, C. Wawrzencyk, G.D. Prestwich, and M. Kochman, "Juvenile Hormone Binding Protein from the Epidermis of *Galleria mellonella*," *Insect Biochem.*, **18**, 29-36 (1988).
93. R.G. Vogt and G.D. Prestwich, "Variation in Olfactory Proteins: Evolvable Elements Encoding Insect Behavior," *Ann. N.Y. Acad. Sci.*, **510**, 689-691 (1987).
94. M.F. Boehm and G.D. Prestwich, "Synthesis of High Specific Activity Hydroprene: Use of an Iron Carbonyl Adduct to Protect an (*E,E*)-dienoate During Homogeneous Tritiation," *J. Org. Chem.*, **52**, 1349-1351 (1987).
95. G.D. Prestwich, "Chemistry of Pheromone and Hormone Metabolism in Insects," *Science*, **237**, 999-1006 (1987).
96. F.X. Webster and G.D. Prestwich, "Synthesis of Carrier-Free Tritium-Labeled Queen Bee Pheromone," *J. Chem. Ecol.*, **14**, 957-962 (1988).

97. G.D. Prestwich and L. Streinz, "Haloacetate Analogs of Pheromones: Effects on Catabolism and Electrophysiology in *Plutella xylostella*," *J. Chem. Ecol.*, **14**, 1003-1021 (1988).
98. Y.A.I. Abdel-Aal, T.N. Hanzlik, B.D. Hammock, L.G. Harshman, and G.D. Prestwich, "Juvenile Hormone Esterases in Two Heliothines: Kinetic, Biochemical and Immunogenic Characterization," *Comp. Biochem. Physiol.*, **90B**, 117-124 (1988).
99. G.D. Prestwich, W.-C. Sun, and J.C. Dickens, "Fluorinated Analogs of the Aldehyde Components of the Boll Weevil Pheromone: Synthesis and Biological Activity," *J. Chem. Ecol.*, **14**, 1427-1439 (1988).
100. Y.-S. Ding and G.D. Prestwich, "Chemical Studies of Proteins That Degrade Pheromones: Cyclopropanated, Fluorinated, and Electrophilic Analogs of Unsaturated Aldehyde Pheromones," *J. Chem. Ecol.*, **14**, 2033-2046 (1988).
101. M.F. Boehm and G.D. Prestwich, "Synthesis of [8,9-<sup>3</sup>H<sub>2</sub>]-Methoprene, a Juvenile Hormone Analog, by Selective Reduction of a Protected Trienoate," *J. Labelled Cmpnd. Radiopharm.*, **25**, 653-659 (1988).
102. G.D. Prestwich, W.-s. Eng, S. Robles, R.G. Vogt, J. Wisniewski, and C. Wawrzenczyk, "Synthesis and Binding Affinity of an Iodinated Juvenile Hormone," *J. Biol. Chem.*, **263**, 1398-1404 (1988).
103. W.-s. Eng and G.D. Prestwich, "A Short Radiosynthesis of Natural Juvenile Hormone III, [12-<sup>3</sup>H]-(10*R*)-Methyl 10,11-Epoxyfarnesoate," *J. Labelled Cmpnd. Radiopharm.*, **25**, 627-633 (1988).
104. J.C. Dickens and G.D. Prestwich, "Differential Recognition of Geometrical Isomers by the Boll Weevil *Anthonomus grandis* BOH. (Coleoptera: Curculionidae): Evidence for Only Three Essential Components in Aggregation Pheromone," *J. Chem. Ecol.*, **15**, 529-540 (1989).
105. R.G. Vogt, G.D. Prestwich, and L.M. Riddiford, "Sex Pheromone Receptor Proteins: Visualization Using a Radiolabeled Photoaffinity Analog," *J. Biol. Chem.*, **263**, 3952-3959 (1988).
106. P. Kulcsár and G.D. Prestwich, "Detection and Microsequencing of Juvenile Hormone Binding Proteins of an Insect By Use of an Iodinated JH Analog," *FEBS Lett.*, **228**, 49-52 (1988).
107. G.D. Prestwich, "The Chemicals of Termite Societies," *Sociobiology*, **14**, 175-191 (1988).
108. P. Kulcsár and G.D. Prestwich, "Fluorography of Tritium-Labeled Proteins in Silver-Stained Polyacrylamide Gels," *Analyt. Biochem.*, **170**, 528-531 (1988).
109. M.F. Boehm and G.D. Prestwich, "Synthesis of Tritium-Labeled Fenoxcarb and S-31183, Two Phenoxypheyl Ether Insect Growth Regulators," *J. Labelled Cmpnd. Radiopharm.*, **25**, 1007-1015 (1988).

110. B. Latli and G.D. Prestwich, "Synthesis of a Tritium-Labeled Photoaffinity Analog of the Tussock Moth Pheromone: Tritium NMR of (*E*) and (*Z*) Alkene Isomers," *J. Org. Chem.*, **53**, 4603-4605 (1988).
111. X.-y. Xiao, S.-K. Park, and G.D. Prestwich, "Phenylsulfone-Directed Diastereoselective Cyclization of an Epoxy Allylsilane System," *J. Org. Chem.*, **53**, 4869-4872 (1988).
112. M.F. Boehm and G.D. Prestwich, "Fluorinated Analogs and Tritiated Enantiomers of Inositol (1,3,4)-Trisphosphate," *Tetrahedron Lett.*, **29**, 5217-5220 (1988).
113. G.D. Prestwich, S.McG. Graham, J.-w. Kuo, and R.G. Vogt, "Tritium-Labeled Enantiomers of Disparlure: Synthesis and *in Vitro* Metabolism," *J. Am. Chem. Soc.*, **111**, 636-642 (1989).
114. G.D. Prestwich, S.McG. Graham, B. Latli, M. Handley, L. Streinz, and M.L. Tasayco J., "Enzymatic Processing of Pheromones and Pheromone Analogs," *Experientia*, **45**, 263-270 (1989).
115. M.A. Mohamed, K.A. Lerro, and G.D. Prestwich, " Polyacrylamide Gel Miniaturization Improves Protein Visualization and Autoradiographic Detection," *Analyt. Biochem.*, **177**, 287-290 (1989).
116. G.D. Prestwich, "Bio-organic Studies of Insect Olfaction," *Pure Appl. Chem.* **61**, 551-554 (1989).
117. S.E. Sen and G.D. Prestwich, "Trisnorsqualene Alcohol, A Potent Inhibitor of Vertebrate Squalene Oxidase," *J. Am. Chem. Soc.*, **111**, 1508-1510 (1989).
118. R.G. Vogt, A.C. Koehne, J.T. Dubnau, and G.D. Prestwich, "Expression of Pheromone Binding Proteins During Development in the Gypsy Moth *Lymantria dispar*," *J. Neurosci.*, **9**, 3332-3348 (1989).
119. G.D. Prestwich and C. Wawrzenczyk, "Synthesis of Allyl Vinyl Silanes. Preparation of 12-(Dimethylsila)squalene," *Tetrahedron Lett.*, **30**, 403-406 (1989).
120. S.R. Palli, E. Osir, M.F. Boehm, W.-s. Eng, M. Edwards, P. Kulcsár, I. Ujváry, K. Hiruma, G.D. Prestwich, and L.M. Riddiford, "Juvenile Hormone Receptors in Larval Epidermis: Identification by Photoaffinity Labeling," *Proc. Natl. Acad. Sci. USA*, **87**, 796-800 (1990).
121. G.D. Prestwich, S.McG. Graham, and W.A. Koenig, "Enantioselective Opening of (+) and (-) Disparlure by Epoxide Hydrolases in Gypsy Moth Antennae," *J. Chem. Soc., Chem. Commun.*, 575-577 (1989).
122. S.E. Sen and G.D. Prestwich, "Squalene Analogs Containing Isopropylidene Mimics as Potential Inhibitors of Pig Liver Squalene Epoxidase and Oxidosqualene Cyclase," *J. Med. Chem.*, **32**, 2152-2158 (1989).
123. J.F. Marecek and G.D. Prestwich, "Synthesis of Tritium Labeled Enantiomers of *myo*-Inositol (1,4,5) Triphosphate," *J. Labelled Compd. Radiopharm.*, **27**, 917-925 (1989).

124. I. Ujváry, W.-s. Eng, and G.D. Prestwich, "Syntheses of Homologous, Tritium-Labeled Analogs of the Natural Juvenile Hormones JH I, JH II, and JH III," *J. Labelled Compnd. Radiopharm.*, **28**, 65-72 (1990).
125. J.F. Marecek and G.D. Prestwich, "Fluorinated Analogs of Ins(1,4,5)P<sub>3</sub>," *Tetrahedron Lett.*, **30**, 5401-5404 (1989).
126. G.D. Prestwich, W.-C. Sun, M.S. Mayer, and J.C. Dickens, "Perfluorinated Moth Pheromones: Synthesis and Electrophysiological Activity," *J. Chem. Ecol.*, **16**, 1761-1778 (1990).
127. I. Ujváry and G.D. Prestwich, "An Efficient Synthesis of the Crustacean Hormone [12-<sup>3</sup>H]-Methyl Farnesoate and its Photolabile Analog [13-<sup>3</sup>H]-Farnesyl Diazomethyl Ketone," *J. Labelled Compnd. Radiopharm.*, **28**, 167-174 (1990).
128. S.E. Sen and G.D. Prestwich, "Trisnorsqualene Cyclopropylamine: A Reversible, Tight- Binding Inhibitor of Squalene Epoxidase," *J. Am. Chem. Soc.*, **111**, 8761-8762 (1989).
129. M.L. Tasayco J. and G.D. Prestwich, "Aldehyde Oxidizing Enzymes in an Adult Moth. *in Vitro* Study of Pheromone Degradation in *Heliothis virescens*," *Arch. Biochem. Biophys.*, **278**, 444-451 (1990).
130. S.E. Sen, C. Wawrzenczyk and G.D. Prestwich, "Inhibition of Vertebrate Squalene Epoxidase by Extended and Truncated Analogs of Trisnorsqualene Alcohol," *J. Med. Chem.*, **33**, 1698-1701 (1990).
131. G.D. Prestwich, M.J. Bruce, I. Ujváry, and E.S. Chang, "Binding Proteins for Methyl Farnesoate in Lobster Tissues: Detection by Photoaffinity Labeling," *Gen. Comp. Endocrinol.*, **80**, 232-237 (1990).
132. W.-C. Sun and G.D. Prestwich, "Partially Fluorinated Analogs of (*Z*)-9-Dodecenyl Acetate: Probes for Pheromone Hydrophobicity Requirements," *Tetrahedron Lett.*, **31**, 801-804 1990).
133. M.L. Tasayco J. and G.D. Prestwich, "A Specific Affinity Reagent to Distinguish Aldehyde Dehydrogenases and Oxidases. Enzymes Catalyzing Aldehyde Oxidation in an Adult Moth," *J. Biol. Chem.*, **265**, 3094-3101 (1990).
134. X.-y. Xiao, S.E. Sen, and G.D. Prestwich, "Vinyl Oxirane Analog of (3*S*)-2,3-Epoxy-squalene: A Substrate for Oxidosqualene Cyclases from Yeast and from Hog Liver," *Tetrahedron Lett.*, **31**, 2097-2100 (1990).
135. A. Momar, P. Kulcsár, and G.D. Prestwich, "Effective Removal of Excess Coomassie Blue from Polyacrylamide Gels," *BioTechniques*, **9**, 534-535 (1990).
136. G.D. Prestwich, "Photoaffinity Labeling and Biochemical Characterization of Binding Proteins for Pheromones, Juvenile Hormones, and Peptides," *Insect Biochem.*, **21**, 27-40 (1991).
137. K.A. Lerro and G.D. Prestwich, "Cloning and Sequencing of a cDNA for the Hemolymph Juvenile Hormone Binding Protein of Larval *Manduca sexta*," *J. Biol. Chem.*, **265**, 19800-19806 (1990).

138. M.L. Tasayco J. and G.D. Prestwich, "Aldehyde Dehydrogenases and Aldehyde Oxidases in Five Moth Species," *Insect Biochem.*, **20**, 691-700 (1990).
139. W.G. King, C.P. Downes, G.D. Prestwich, and S.E. Rittenhouse, "Ca<sup>2+</sup>-Stimulatable and Protein Kinase C-Inhibitable Accumulation of Inositol 1,3,4,6-Tetrakisphosphate in Human Platelets," *Biochem. J.*, **270**, 125-131 (1990).
140. E.E. Blatter, M.L. Tasayco, G.D. Prestwich, and R. Pietruszko, "Chemical Modification of Aldehyde Dehydrogenase by a Vinyl Ketone Analogue of an Insect Pheromone," *Biochem. J.*, **272**, 351-358 (1990).
141. I. Valterová, M. Budesinsky, J. Vrkoc, and G.D. Prestwich, "(8Z)-1(15),8(9)-Tri-nervitadien-3 $\alpha$ -ol from *Nasutitermes nigriceps* Termites. The Revised Structure for a Defense Compound of *Trinervitermes graciosus*," *Coll. Czech. Chem. Commun.*, **55**, 1580-1585 (1990).
142. M. Bengtsson, S. Rauscher, H. Arn, W.-C. Sun, and G.D. Prestwich, "Fluorine-Substituted Pheromone Components Affect the Behavior of the Grape Berry Moth," *Experientia*, **46**, 1211-1213 (1990).
143. G.D. Prestwich and J.K. Atkinson, "Rapid Purification and N-Terminal Amino Acid Sequence of a Photoaffinity-Labeled Juvenile Hormone Binding Protein from an Arctiid Moth Larva, *Platyrepia virginalis*," *Insect Biochem.*, **20**, 801-807 (1990).
144. G.D. Prestwich, J.F. Marecek, R.J. Mourey, A.B. Theibert, C.D. Ferris, S.K. Danoff, and S.H. Snyder, "Tethered IP<sub>3</sub>. Synthesis and Biochemical Applications of the 1-O-(3-Amino-propyl) Ester of Inositol (1,4,5) Trisphosphate," *J. Am. Chem. Soc.*, **113**, 1822-1825 (1991).
145. E.S. Chang, G.D. Prestwich, and M.J. Bruce, "Amino Acid Sequence of a Peptide with Both Molt-Inhibiting and Hyperglycemic Activities in the Lobster, *Homarus americanus*," *Biochem. Biophys. Res. Comm.*, **171**, 818-826 (1990).
146. R.G. Vogt, G.D. Prestwich, and M.R. Lerner, "Odorant-Binding-Protein Subfamilies Associate with Distinct Classes of Olfactory Receptor Neurons in Insects," *J. Neurobiol.*, **22**, 74-84 (1991).
147. X.-y. Xiao and G.D. Prestwich, "Minimizing Geometric Isomerization During Oxidation of Allylic Alcohols to Aldehydes," *Syn. Commun.*, **20**, 3125-3130 (1990).
148. G.D. Prestwich, M.J. Bruce, and E.S. Chang, "Binding Proteins for a Peptide Hormone in the Shrimp *Sicyonia ingentis*: Evidence from Photoaffinity Labeling with Red Pigment Concentrating Hormone Analogs," *Gen. Comp. Endocrinol.*, **83**, 473-480 (1991).
149. E.O. Osir, G.C. Unnithan, and G.D. Prestwich, "Juvenile Hormone Binding to a 500-K Diapause-Associated Protein of the Stem-Borer, *Busseola fusca*," *Comp. Biochem. Physiol.*, **99B**, 165-169 (1991).
150. B.M. Okot-Kotber, I. Ujváry, R. Mollaaghababa, F. Szurdoki, G. Matolscy, and G.D. Prestwich, "Physiological Influence of Fenoxycarb Pro-Insecticides and Soldier Head Extracts of Various Termite Species on Soldier Differentiation in *Reticulitermes flavipes* (Isoptera)," *Sociobiology*, **19**, 77-90 (1991).

151. W.-C. Sun, C.-S. Ng, and G.D. Prestwich, "Synthesis of Partially Fluorinated Analogues of (Z)-5-Decenyl Acetate: Probes for Hydrophobic Interaction in Pheromone Reception," *J. Org. Chem.*, **57**, 132-137 (1992).
152. A.B. Theibert, V.A. Estevez, C.D. Ferris, S.K. Danoff, R.K. Barrow, G.D. Prestwich, and S.H. Snyder, "Inositol 1,3,4,5-Tetrakisphosphate and Inositol Hexakisphosphate Receptor Proteins: Isolation and Characterization from Rat Brain," *Proc. Natl. Acad. Sci., USA*, **88**, 3165-3169 (1991).
153. J.C. Dickens, G.D. Prestwich, W.-C. Sun, and K. Mori, "Receptor Site Analysis Using Neurosensory Responses of the Boll Weevil to Analogs of the Cyclohexylideneethanol Component of its Aggregation Pheromone," *Chem. Senses*, **16**, 239-250 (1991).
154. J.C. Dickens, G.D. Prestwich, and W.-C. Sun, "Behavioral and Neurosensory Responses to the Boll Weevil, *Anthonomus grandis* Boh. (Coleoptera: Curculionidae) to Fluorinated Analogs of Aldehyde Components of its Pheromone," *J. Chem. Ecol.*, **17**, 1007-1020 (1991).
155. V.A. Estevez and G.D. Prestwich, "Affinity Probes for Ins(1,3,4,5)P<sub>4</sub> Receptors," *Tetrahedron Lett.*, **32**, 1623-1626 (1991).
156. J.F. Marecek and G.D. Prestwich, "Synthesis of Tethered Phytic Acid," *Tetrahedron Lett.*, **32**, 1863-1866 (1991).
157. X.-y. Xiao and G.D. Prestwich, "Regio- and Stereo-Controlled Synthesis of [24,30-<sup>14</sup>C]-Labeled 2,3-Epoxy-squalene," *J. Labelled Compnd. Radiopharm.*, **29**, 883-890 (1991).
158. B.M. Okot-Kotber and G.D. Prestwich, "Juvenile Hormone Binding Proteins of Termites Detected by Photoaffinity Labeling: Comparison of *Zootermopsis nevadensis* with Two Rhinotermitids," *Arch. Insect Biochem. Physiol.*, **17**, 119-128 (1991).
159. J.-w. Kuo, D.A. Swann, G.D. Prestwich, "Chemical Modification of Hyaluronic Acid by Carbodiimides," *Bioconjugate Chem.*, **2**, 232-241 (1991).
160. B.M. Okot-Kotber and G.D. Prestwich, "Identification of a Juvenile Hormone Binding Protein in the Castes of the Termite, *Reticulitermes flavipes*, by Photoaffinity Labeling," *Insect Biochem.*, **21**, 775-784 (1991).
161. B. Latli and G.D. Prestwich, "Metabolically-Blocked Analogs of the Housefly Sex Pheromone. I. Synthesis of Alternative Substrates for the Cuticular Monooxygenases," *J. Chem. Ecol.*, **17**, 1745-1768 (1991).
162. L. Guo, B. Latli, G.D. Prestwich, and G.J. Blomquist, "Metabolically-Blocked Analogs of the Housefly Sex Pheromone. II. Biochemical Metabolism Studies," *J. Chem. Ecol.*, **17**, 1769-1782 (1991).
163. G.M. Anstead, S.E. Sen, and G.D. Prestwich, "Evaluation of Squalene Analogs Bearing Photoreactive Groups as Photoaffinity Labels for Squalene Epoxidase and Oxidosqualene Cyclase," *Bioorganic Chem.*, **19**, 300-313 (1991).



164. M. Bai, X.-y. Xiao, and G.D. Prestwich, "26-Hydroxysqualene and Derivatives: Substrate and Inhibitor of Squalene Epoxidase," *Bioorg. Med. Chem. Lett.*, **1**, 227-232 (1991).
165. B. Latli and G.D. Prestwich, "Synthesis of Labeled (10*R*)-Juvenile Hormone III Bisepoxide, and Its Photoaffinity Analog, [12-<sup>3</sup>H]-(10*R*)-6,7,10,11-Bisepoxyfarnesyl Diazoacetate (BEFDA)," *J. Labelled Compd. Radiopharm.*, **29**, 1167-1173 (1991).
166. S.M. Graham and G.D. Prestwich, "Tissue Distribution and Substrate Specificity of an Epoxide Hydrase in the Gypsy Moth, *Lymantria dispar*," *Experientia*, **48**, 19-21 (1992).
167. D.L. Kalinoski, S.B. Aldinger, A.G. Boyle, T. Huque, J.F. Marecek, G.D. Prestwich, and D. Restrepo, "Characterization of a Novel Inositol 1,4,5-Trisphosphate Receptor in Isolated Olfactory Cilia," *Biochem. J.*, **281**, 449-456 (1992).
168. K. Naumann, M.L. Winston, K.N. Slessor, G.D. Prestwich, and F.X. Webster, "Production and Transmission of Honey Bee Queen (*Apis mellifera* L.) Mandibular Gland Pheromone," *Behav. Ecol. Sociobiol.*, **29**, 321-332 (1991).
169. A.B. Theibert, V.A. Estevez, R.J. Mourey, J.F. Marecek, R.K. Barrow, G.D. Prestwich, and S.H. Snyder, "Photoaffinity Labeling and Characterization of Isolated Inositol 1,3,4,5-Tetrakisphosphate- and Inositol Hexakisphosphate-binding Proteins," *J. Biol. Chem.*, **267**, 9071-9079 (1992).
170. X.-y. Xiao and G.D. Prestwich, "29-Methylidene-2,3-oxidosqualene: A Potent Mechanism-Based Inactivator of Oxidosqualene Cyclase," *J. Am. Chem. Soc.*, **113**, 9673-9674 (1991).
171. V.A. Estevez and G.D. Prestwich, "Synthesis of Chiral, P-1 Tethered Inositol Tetrakisphosphate Affinity Labels *via* a Ferrier Rearrangement," *J. Am. Chem. Soc.*, **113**, 9885-9887 (1991).
172. X.-y. Xiao and G.D. Prestwich, "Enzymatic Cyclizations of 26- and 29-Hydroxy-2,3-Oxidosqualenes Give 19- and 21-Hydroxylanosterols," *Tetrahedron Lett.*, **32**, 6843-6846 (1991).
173. J. Krieger, K. Raming, G.D. Prestwich, D. Frith, S. Stabel, and H. Breer, "Expression of a Pheromone Binding Protein in Insect Cells Using a Baculovirus Vector," *Eur. J. Biochem.*, **203**, 161-166 (1992).
174. M. Bai and G.D. Prestwich, "Inhibition and Activation of Porcine Squalene Epoxidase," *Arch. Biochem. Biophys.*, **293**, 305-313 (1992).
175. M. Cusson, G.D. Prestwich, B. Stay, and S.S. Tobe, "Photoaffinity Labeling of Allatostatin Receptor Proteins in the Corpora Allata of the Cockroach *Diploptera punctata*," *Biochem. Biophys. Res. Commun.*, **181**, 736-742 (1991).
176. K. Touhara and G.D. Prestwich, "Binding Site Mapping of a Photoaffinity-Labeled Juvenile Hormone Binding Protein," *Biochem. Biophys. Res. Commun.*, **182**, 466-473 (1992).

177. J.F. Marecek, V.A. Estevez, and G.D. Prestwich, "New Tetherable Derivatives of *myo*-Inositol 2,4,5- and 1,3,4-Trisphosphates," *Carbohydr. Res.*, **234**, 65-73 (1992).
178. C. Linn, W.L. Roelofs, W.-C. Sun, and G.D. Prestwich, "Activity of Perfluorobutyl-Containing Components in Pheromone Blend of Cabbage Looper Moth, *Trichoplusia ni*," *J. Chem. Ecol.*, **18**, 737-748 (1992).
179. T. Pouyani, J.-w. Kuo, G.S. Harbison, and G.D. Prestwich, "Solid-State NMR of *N*-Acylureas Derived from the Reaction of Hyaluronic Acid with Isotopically-Labeled Carbodiimides," *J. Am. Chem. Soc.*, **114**, 5972-5976 (1992).
180. J. Chase, K. Touhara, G.D. Prestwich, C. Schal, and G.J. Blomquist, "Biosynthesis and Endocrine Control of the Production of the German Cockroach Sex Pheromone, 3,11-Dimethylnonacosane to 3,11-Dimethylnonacosan-2-one," *Proc. Natl. Acad. Sci., USA*, **89**, 6050-6054 (1992).
181. D. Restrepo, J.H. Teeter, E. Honda, A.G. Boyle, J.F. Marecek, G.D. Prestwich, and D.L. Kalinoski, "Evidence for an IP<sub>3</sub>-Gated Channel Protein in Isolated Rat Olfactory Cilia," *Am. J. Physiol. Cell Physiol.*, C667-C673 (1992).
182. M. Bai, X.-y. Xiao, and G.D. Prestwich, "Epoxidation of 2,3-Oxidosqualene to 2,3,22,23-Squalene Dioxide by Squalene Epoxidase," *Biochem. Biophys. Res. Commun.*, **185**, 323-329 (1992).
183. W. Wu, M. Bengtsson, B.S. Hansson, T. Liljefors, C. Löfstedt, G.D. Prestwich, W.-C. Sun, and M. Svensson, "Electrophysiological and Behavioral Responses of Turnip Moth Males, *Agrotis segetum*, to Fluorinated Pheromone Analogs," *J. Chem. Ecol.*, **19**, 143-157 (1992).
184. M. Abdullah, P.J. Hughes, A. Craxton, R. Gigg, J.F. Marecek, G.D. Prestwich, and S.B. Shears, "Purification and Characterization of Inositol (1,3,4) Trisphosphate 5/6 Kinase from Rat Liver Using an Inositol Hexakisphosphate Affinity Column," *J. Biol. Chem.*, **267**, 22340-22345 (1992).
185. I. Abe, M. Bai, X.-y. Xiao, and G.D. Prestwich, "Affinity Labeling of Vertebrate Oxidosqualene Cyclases with a Tritiated Suicide Substrate," *Biochem. Biophys. Res. Commun.*, **187**, 32-38 (1992).
186. S.M. Voglmaier, J.H. Keen, J. Murphy, C.D. Ferris, G.D. Prestwich, S.H. Snyder, and A.B. Theibert, "Inositol Hexakisphosphate Receptor Identified as the Clathrin Assembly Protein AP-2," *Biochem. Biophys. Res. Commun.*, **187**, 158-163 (1992).
187. B.S. Coller, P. Ward, M. Ceruso, L.E. Scudder, K. Springer, J. Kutok, and G.D. Prestwich, "Thrombin Receptor Activating Peptides: Importance of the N-Terminal Serine and its Ionization State as Judged by pH Dependence, Nuclear Magnetic Resonance Spectroscopy, and Cleavage by Aminopeptidase M," *Biochemistry*, **31**, 11713-11720 (1992).
188. K. Naumann, M.L. Winston, K.N. Slessor, B. Latli, and G.D. Prestwich, "Intra-nest Transmission of Aromatic Honey Bee Queen Mandibular Gland Pheromone Components. Movement as a Unit," *Can. Ent.*, **124**, 917-934 (1992).

189. K. Touhara, K.A. Lerro, B.C. Bonning, B.D. Hammock, and G.D. Prestwich, "Ligand Binding by a Recombinant Insect Juvenile Hormone Binding Protein," *Biochemistry*, **32**, 2068-2075 (1993).
190. G.D. Prestwich, "Bacterial Expression and Photoaffinity Labeling of a Pheromone Binding Protein," *Protein Sci.*, **2**, 420-428 (1993).
191. R.J. Mourey, V.A. Estevez, J.F. Marecek, R.K. Barrow, G.D. Prestwich, and S.H. Snyder, "Inositol 1,4,5-Trisphosphate Receptors: Mapping the Inositol 1,4,5-Trisphosphate Binding Site with Photoaffinity Ligands," *Biochemistry*, **32**, 1719-1726 (1993).
192. B.M. Okot-Kotber, G.D. Prestwich, A. Strambi, and C. Strambi, "Changes in Morphogenetic Hormone Titrers in Isolated Workers of the Termite *Reticulitermes flavipes* (Kollar)," *Gen. Comp. Endocrinol.*, **90**, 290-295 (1993).
193. G.D. Prestwich, "Chemical Studies of Pheromone Receptors in Insects," *Arch. Insect Biochem. Physiol.*, **22**, 75-86 (1993).
194. M.P. Mayer, G.D. Prestwich, J.M. Dolence, P.D. Bond, H.-y. Wu, and C.D. Poulter, "Protein Farnesyltransferase. Production in *Escherichia coli* and Immunoaffinity Purification of the Heterodimer from *Saccharomyces cerevisiae*," *Gene*, **132**, 41-47 (1993).
195. W.A. König, B. Gehrcke, M.G. Peter, and G.D. Prestwich, "Direct Gas Chromatographic Enantiomeric Resolution of Juvenile Hormones I - III," *Tetrahedron Asymmetry*, **4**, 165-168 (1993).
196. G.M. Anstead, H.-K. Lin, and G.D. Prestwich, "Trisnorsqualene Methyl Hydroxylamine: A Potent Dual Inhibitor of Mammalian Squalene Epoxidase and Oxidosqualene Cyclase," *Bioorg. Med. Chem. Lett.*, **3**, 1319-1322 (1993).
197. K. Touhara and G.D. Prestwich, "Juvenile Hormone Epoxide Hydrolase: Photoaffinity Labeling, Purification, and Characterization from Tobacco Hornworm Eggs," *J. Biol. Chem.*, **268**, 19604-19609 (1993).
198. I. Abe, M. Rohmer, and G.D. Prestwich, "Enzymatic Cyclization of Squalene and Oxidosqualene to Sterols and Triterpenes," *Chem. Rev.*, **93**, 2189-2206 (1993).
199. B.S. Coller, K.T. Springer, L.E. Scudder, J.L. Kutok, M. Ceruso, and G.D. Prestwich, "Substituting Isoleucine for Serine in the Thrombin Receptor Activation Peptide SFLLRN Confers Resistance to Aminopeptidase M-Induced Cleavage and Inactivation," *J. Biol. Chem.*, **268**, 20741-20743 (1993).
200. K. Touhara and G.D. Prestwich, "Role of Juvenile Hormone Binding Protein in Modulating Function of JH Epoxide Hydrolase in Eggs of *Manduca sexta*," *Insect Biochem. Molec. Biol.*, **24**, 641-646 (1994).
201. K. Touhara, V. Soroker, and G.D. Prestwich, "Photoaffinity Labeling of Juvenile Hormone Epoxide Hydrolase and JH-Binding Proteins during Ovarian and Egg Development in *Manduca sexta*," *Insect Biochem. Molec. Biol.*, **24**, 633-640 (1994).

202. K. Touhara, H. Wojtasek, and G.D. Prestwich, "Covalent Modification of Juvenile Hormone Binding Proteins by Photoaffinity Labeling: An Unexpected Gel Shift Effect," *Arch. Insect Biochem. Physiol.*, **26**, 287-297 (1994).
203. J.C. Dickens, G.D. Prestwich, C.-S. Ng, and J.H. Visser, "Selectively Fluorinated Analogs Reveal Differential Olfactory Reception and Inactivation of Green Leaf Volatiles in Insects," *J. Chem. Ecol.*, **19**, 1981-1991 (1993).
204. D. Borovsky, D. Carlson, I. Ujváry, and G.D. Prestwich, "Biosynthesis of (10*R*)-Juvenile Hormone III from Farnesoic Acid by *Aedes aegypti* Ovary," *Arch. Insect Biochem. Physiol.*, **27**, 11-25 (1994).
205. I. Abe and G.D. Prestwich, "Active Site Mapping of Affinity-Labeled Rat Oxidosqualene Cyclase," *J. Biol. Chem.*, **269**, 802-804 (1994).
206. S.R. Palli, K. Touhara, J.-P. Charles, B.C. Bonning, J.K. Atkinson, S.C. Trowell, K. Hiruma, W.G. Goodman, T. Kyriakides, G.D. Prestwich, B.D. Hammock, and L.M. Riddiford, "A Nuclear Juvenile Hormone-Binding Protein from Larvae of *Manduca sexta*: A Putative Receptor for the Metamorphic Action of Juvenile Hormone," *Proc. Natl. Acad. Sci., USA*, **91**, 6191-6195 (1994).
207. I. Abe, J.C. Tomesch, S. Wattanasin, and G.D. Prestwich, "Inhibitors of Squalene Biosynthesis and Metabolism," *Natural Prod. Rept.*, 279-302 (1994).
208. G.D. Prestwich, K. Touhara, L.M. Riddiford, and B. D. Hammock, "Larva Lights: A Decade of Photoaffinity Labeling with Juvenile Hormone Analogues," *Insect Biochem. Molec. Biol.*, **24**, 747-761 (1994).
209. T. Pouyani and G.D. Prestwich, "Functionalized Derivatives of Hyaluronic Acid Oligosaccharides: Drug Carriers and Novel Biomaterials," *Bioconjugate Chem.*, **5**, 339-347 (1994).
210. T. Pouyani and G.D. Prestwich, "Biotinylated Hyaluronic Acid: A New Tool for Probing Hyaluronate-Receptor Interactions," *Bioconjugate Chem.*, **5**, 370-372 (1994).
211. G. Du, C.-S. Ng, and G.D. Prestwich, "Odorant Binding by a Pheromone Binding Protein: Active Site Mapping by Photoaffinity Labeling," *Biochemistry*, **33**, 4812-4819 (1994).
212. S.M. Graham and G.D. Prestwich, "Synthesis and Inhibitory Properties of Pheromone Analogues for the Epoxide Hydrolase of the Gypsy Moth," *J. Org. Chem.*, **59**, 2956-2966 (1994).
213. K. Touhara, B.C. Bonning, B.D. Hammock, and G.D. Prestwich, "Action of Juvenile Hormone (JH) Esterase on the JH-JH Binding Protein Complex. An *In Vitro* Model of JH Metabolism in a Caterpillar," *Insect Biochem. Molec. Biol.*, **25**, 727-734 (1995).
214. K. Poralla, A. Hewelt, G.D. Prestwich, I. Abe, I. Reipen, and G. Sprenger, "A Specific Amino Acid Repeat in Squalene and Oxidosqualene Cyclases" *Trends Biochem. Sci.*, **19**, 157-158 (1994).

215. G. Dormán and G.D. Prestwich, "Benzophenone Photophores in Biochemistry," *Biochemistry*, **33**, 5661-5673 (1994).
216. T. Pouyani, G.S. Harbison, and G.D. Prestwich, "Novel Hydrogels of Hyaluronic Acid: Synthesis, Surface Morphology, and Solid-State NMR," *J. Am. Chem. Soc.*, **116**, 7515-7522 (1994).
217. B.A. Madden and G.D. Prestwich, "Asymmetric Synthesis of a Mechanism-Based Inhibitor of Oxidosqualene Cyclase," *J. Org. Chem.* **59**, 5488-5490 (1994).
218. M. Ceruso and G.D. Prestwich, "Novel Non-Squalenoid Photoaffinity Labels for Mammalian Squalene Epoxidase," *Bioorg. Med. Chem. Lett.*, **4**, 2179-2184 (1994).
219. V.L. Sevala, K.G. Davey, and G.D. Prestwich, "Photoaffinity Labeling and Characterization of a Juvenile Hormone Binding Protein in the Membranes of Follicle Cells of *Locusta migratoria*," *Insect Biochem. Molec. Biol.*, **25**, 267-273 (1995).
220. B. Koutek, G.D. Prestwich, A.C. Howlett, S.A. Chin, D. Salehani, N. Akhavan, and D.G. Deutsch, "Inhibitors of Arachidonoyl Ethanolamide Hydrolysis," *J. Biol. Chem.*, **269**, 22937-22940 (1994).
221. A. Chaudhary, G. Dormán and G.D. Prestwich, "Synthesis of P-5 Tethered Inositol-1,2,6-Trisphosphate, An Affinity Reagent for  $\alpha$ -Trinositol Receptors," *Tetrahedron Lett.*, **35**, 7521-7524 (1994).
222. I. Abe and G.D. Prestwich, "Identification of the Active Site of Vertebrate Oxidosqualene Cyclase," *Lipids*, **30**, 231-234 (1995).
223. P. Denner-Ancona, M. Bai, H.-K. Lee, I. Abe, and G.D. Prestwich, "Purification of Pig and Rat Liver Squalene Epoxidase by Affinity Chromatography," *Bioorg. Med. Chem. Lett.*, **5**, 481-486 (1995).
224. J.F. Andersen, M. Ceruso, G.C. Unnithan, E. Kuwano, G.D. Prestwich, and R. Feyereisen, "Photoaffinity Labeling of Methyl Farnesoate Epoxidase in Cockroach Corpora Allata," *Insect Biochem. Molec. Biol.*, **25**, 713-719 (1995).
225. M.L. Grieneisen, T.D. Kieckbusch, A. Mok, G. Dormán, B. Latli, G.D. Prestwich, and D.A. Schooley, "Characterization of the Juvenile Hormone Epoxide Hydrolase (JHEH) and Juvenile Hormone Diol Phosphotransferase (JHDPT) from *Manduca sexta* Malpighian Tubules," *Arch. Insect Physiol. Biochem.*, **30**, 255-270 (1995).
226. H. Wojtasek and G.D. Prestwich, "Key Disulfide Bonds in an Insect Hormone Binding Protein: cDNA Cloning of a Juvenile Hormone Binding Protein of *Heliothis virescens* and Ligand Binding by Native and Mutant Forms," *Biochemistry*, **34**, 5234-5241 (1995).
227. G.D. Prestwich, G. Du, and S. LaForest, "How is Pheromone Specificity Encoded in Proteins?," *Chem. Senses*, **20**, 461-469 (1995).

228. G. Dormán, D.G. Ahern, Y. Hong, J.D. Olszewski, and G.D. Prestwich, "Synthesis of Highly Tritiated 4-Benzoyl-L-phenylalanine, a Photoactivatable Amino Acid," *J. Org. Chem.*, **60**, 2292-2297 (1995).
229. J.D. Olszewski, G. Dormán, J.T. Elliott, Y. Hong, D.G. Ahern, and G.D. Prestwich, "Tethered Benzophenone Reagents for the Synthesis of Photoactivatable Ligands," *Bioconjugate Chem.*, **6**, 395-400 (1995).
230. G. Du and G.D. Prestwich, "Protein Structure Encodes the Ligand Binding Specificity in Pheromone Binding Proteins," *Biochemistry*, **34**, 8726-8732 (1995).
231. L.E. King, Q. Ding, G.D. Prestwich, and S.S. Tobe, "The Characterization of a Haemolymph Methyl Farnesoate Binding Protein and the Assessment of Methyl Farnesoate Metabolism by the Haemolymph and Other Tissues from *Procambrus clarkii*," *Insect Biochem. Molec. Biol.*, **25**, 495-501 (1995).
232. I. Abe and G.D. Prestwich, "Molecular Cloning, Characterization, and Functional Expression of Rat Oxidosqualene Cyclase cDNA," *Proc. Natl. Acad. Sci., USA*, **92**, 9274-9278 (1995).
233. J.-P. Charles, H. Wojtasek, A.J. Lentz, B.A. Thomas, B.C. Bonning, S.R. Palli, A.G. Parker, G. Dormán, B.D. Hammock, G.D. Prestwich, and L.M. Riddiford, "Purification and Reassessment of Ligand Binding by the Recombinant, Putative Juvenile Hormone Receptor of the Tobacco Hornworm, *Manduca sexta*," *Arch. Insect Biochem. Physiol.*, **31**, 371-393 (1996).
234. J. Feixas, G.D. Prestwich, and A. Guerrero, "Ligand Specificity of Pheromone-Binding Proteins of the Processionary Moth," *Eur. J. Biochem.*, **234**, 521-526 (1995).
235. I. Ojima, O. Duclos, G. Dormán, B. Simonot, G.D. Prestwich, S. Rao, K.A. Lerro, and S.B. Horwitz, "A New Paclitaxel Photoaffinity Analog with a 3-(4-Benzoylphenyl)propanoyl Probe for Characterization of Drug-Binding Sites on Tubulin and P-Glycoprotein," *J. Med. Chem.*, **38**, 3891-3894 (1995).
236. G.D. Prestwich, "Proteins That Smell: Pheromone Recognition and Signal Transduction" *Bioorg. Med. Chem.*, **4**, 505-513 (1996).
237. B.A. Clark and G.D. Prestwich, "Evidence for a C-Terminal Turn in PBAN: An NMR and Distance Geometry Study," *Int. J. Peptide Protein Res.*, **47**, 361-368 (1996).
238. G. Dormán, J. Chen, and G.D. Prestwich, "Synthesis of D-*myo*-P-1-(*O*-Aminopropyl)-Inositol-1,4,5-Trisphosphate Affinity Probes from  $\alpha$ -D-Glucose," *Tetrahedron Lett.*, **36**, 8719-8722 (1995).
239. J. Chen, G. Dormán, and G.D. Prestwich, "Asymmetric Total Synthesis of D-*myo*-Inositol-1,2,4,5-Tetrakisphosphate and its P-2-(*O*-Aminopropyl) Derivative," *J. Org. Chem.*, **61**, 393-397 (1996).
240. R. Boer, M. Dichtl, C. Borchers, W.R. Ulrich, J.F. Marecek, G.D. Prestwich, H. Glossmann, and J. Striessnig, "Reversible Labeling of a Chemosensitizer Binding Domain of *p*-Glycoprotein with a Novel 1,4-Dihydropyridine Drug Transport Inhibitor," *Biochemistry*, **35**, 1387-1396 (1996).

241. G.D. Prestwich, H. Wojtasek, A.J. Lentz, and J.M. Rabinovich, "Biochemistry of Proteins That Bind and Metabolize Juvenile Hormones," *Arch. Insect Biochem. Physiol.* (JH VI issue), **32**, 407-419 (1996).
242. K. Touhara, H. Wojtasek, and G.D. Prestwich, "In Vitro Modeling of the Ternary Interaction in Juvenile Hormone Metabolism," *Arch. Insect Biochem. Physiol.* (JH VI issue), **32**, 399-406 (1996).
243. S.M. Voglmaier, M.E. Bembenek, A.I. Kaplin, G. Dormán, J.D. Olszewski, G.D. Prestwich, and S.H. Snyder, "Purified Inositol Hexakisphosphate Kinase is an ATP Synthase: Diphosphoinositol Pentakisphosphate as a High-Energy Phosphate Donor," *Proc. Natl. Acad. Sci., USA*, **93**, 4305-4310 (1996).
244. H. Wojtasek and G.D. Prestwich, "An Insect Juvenile Hormone-Specific Epoxide Hydrolase is Related to Vertebrate Microsomal Epoxide Hydrolases," *Biochem. Biophys. Res. Commun.*, **220**, 323-329 (1996).
245. G.D. Prestwich, G. Dormán, J.T. Elliott, D.M. Marecak, and A. Chaudhary, "Benzophenone Photoprobes for Phosphoinositides, Peptides, and Drugs," *Photochem. Photobiol.*, **65**, 222-234 (1997).
246. L.P. Hammonds-Odie, T. R. Jackson, A. A. Profit, I.J. Blader, C. W. Turck, G. D. Prestwich, and A.B. Theibert, "Identification and Cloning of Centaurin  $\alpha$ : A Novel Phosphatidyl-inositol 3,4,5-Trisphosphate-Binding Protein from Rat Brain," *J. Biol. Chem.*, **271**, 18859-18868 (1996).
247. G.D. Prestwich "Touching All the Bases: Inositol Polyphosphate and Phosphoinositide Affinity Probes from Glucose," *Acc. Chem. Res.*, **29**, 503-513 (1996).
248. J. Chen, A.A. Profit, and G.D. Prestwich, "Synthesis of Photoactivatable 1,2-*O*-Diacyl-*sn*-glycerol Derivatives of 1-*L*-Phosphatidyl-*D*-*myo*-inositol 4,5-Bisphosphate (PtdInsP<sub>2</sub>) and 3,4,5-Trisphosphate (PtdInsP<sub>3</sub>)," *J. Org. Chem.*, **61**, 6305-6312 (1996). 249. J. Chen and G.D. Prestwich, "Synthesis of a P-1-Tethered Photoaffinity Label for Inositol Hexakisphosphate Binding Proteins," *J. Labelled Compnd. Radiopharm.*, **38**, 1113-1119 (1996).
250. I. Abe, W. Liu, A.C. Oehlschlager, and G.D. Prestwich, "Mechanism-Based Active Site Modification of Oxidosqualene Cyclase by Tritium-Labeled 18-Thia-2,3-Oxidosqualene," *J. Am. Chem. Soc.* **118**, 9180-9181 (1996).
251. M. Glaser, S. Wanaski, C.A. Buser, V. Boguslavsky, W. Rashidzada, A. Morris, M. Rebecchi, S.F. Scarlata, L. W. Runnels, G.D. Prestwich, J. Chen, A. Aderem, J. Ahn, and S. McLaughlin, "Myristoylated Alanine-rich C Kinase Substrate (MARCKS) Produces Reversible Inhibition of Phospholipase C by Sequestering Phosphatidylinositol 4,5-Bisphosphate in Lateral Domains," *J. Biol. Chem.*, **271**, 26187-26193 (1996).
252. G. Schiavo, Q.-M. Gu, G.D. Prestwich, T.H. Söllner, and J.E. Rothman, "Calcium-Dependent Switching of the Specificity of Phosphoinositide Binding to Synaptotagmin" *Proc. Natl. Acad. Sci., USA*, **93**, 13327-13332 (1996).

253. D. Stach, Y.F. Zheng, A.L. Perez, A.C. Oehlschlager, I. Abe, G.D. Prestwich, and P.G. Hartman, "Synthesis and Inhibition Studies of Sulfur-Substituted Squalene Oxide Analogues as Mechanism-Based Inhibitors of 2,3-Oxidosqualene-Lanosterol Cyclase," *J. Med. Chem.*, **40**, 201-209 (1997).
254. S.L. Tamone, G.D. Prestwich, and E.S. Chang, "Identification and Characterization of Methyl Farnesoate Binding Proteins from the Crab, *Cancer magister*," *Gen. Comp. Endocrinol.*, **105**, 168-175 (1997).
255. Q.-M. Gu and G.D. Prestwich, "Synthesis of Phosphotriester Analogues of the Phosphoinositides PtdIns(4,5)P<sub>2</sub> and PtdIns(3,4,5)P<sub>3</sub>," *J. Org. Chem.*, **61**, 8642-8647 (1996).
256. H. Kiefer, J. Krieger, J. D. Olszewski, G. von Heijne, G.D. Prestwich, and H. Breer, "Expression of an Olfactory Receptor in *E. coli*: Purification, Reconstitution, and Ligand Binding," *Biochemistry*, **35**, 16077-16084 (1996).
257. D.G. Deutsch, R. Omeir, G. Arreaza, D. Salehani, G.D. Prestwich, Z. Huang, and A. Howlett, "Methyl Arachidonyl Fluorophosphonate: A Potent Irreversible Inhibitor of Anandamide Amidase," *Biochem. Pharmacol.*, **53**, 255-260 (1997).
258. J. Chen and G.D. Prestwich, "Synthesis of a Tritium-Labelled Diether Analog of Phosphatidylinositol 4,5-Bisphosphate," *J. Labelled Compnd. Radiopharm.*, **39**, 251-258 (1997).
259. O. Thum, J.Chen, and G.D. Prestwich, "Synthesis of a Photoaffinity Analogue of Phosphatidylinositol 3,4-Bisphosphate, an Effector in the Phosphoinositide 3-Kinase Signaling Pathway," *Tetrahedron Lett.*, **37**, 9017-9020 (1996).
260. B.A. Madden and G.D. Prestwich, "Potency and Inactivation Rates of Analogues of an Irreversible Inhibitor of Vertebrate Oxidosqualene Cyclase," *Bioorg. Med. Chem. Lett.*, **7**, 309-314 (1997).
261. S.M. Hammond, J.M. Jenco, S. Nakashima, K. Cadwallader, Q.-M. Gu, S. Cook, Y. Nozawa, G.D. Prestwich, M.A. Frohman, and A.J. Morris, "Characterization of Two Alternately-Spliced Forms of Phospholipase D1. Activation of the Purified Enzymes by Phosphatidylinositol 4,5-Bisphosphate, ARF and Rho Family Monomeric GTP-Binding Proteins and Protein Kinase C- $\alpha$ ," *J. Biol. Chem.* **272**, 3860-3868 (1997).
262. J. Chen and G. D. Prestwich, "Regioselective Synthesis of Photolabile P(1,2)- and P(4,5)-(*o*-Nitrobenzyl) Esters of *myo*-Inositol 1,2,3,4,5,6-Hexakisphosphate," *Tetrahedron Lett.*, **38**, 969-972 (1997).
263. B. Mehrotra, J.T. Elliott, J. Chen, J.D. Olszewski, A.A. Profit, A. Chaudhary, M. Fukuda, K. Mikoshiba, and G.D. Prestwich, "Selective Photoaffinity Labeling of the Inositol Polyphosphate Binding C2B Domains of Synaptotagmins," *J. Biol. Chem.*, **272**, 4237-4244 (1997).
264. Q.-M. Gu and G.D. Prestwich, "Efficient Peptide Ladder Sequencing by MALDI-TOF Mass Spectrometry Using Allyl Isothiocyanate," *Int. J. Peptide Protein Res.*, **49**, 484-491 (1997).



265. G.D. Prestwich, D.M. Marecak, J.F. Marecek, K.P. Vercruyssen, and M.R. Ziebell, "Controlled Chemical Modification of Hyaluronic Acid: Synthesis, Applications, and Biodegradation of Hydrazide Derivatives," *J. Controlled Rel.*, **53**, 93-103 (1998).
266. L. Feng and G.D. Prestwich, "Expression and Characterization of a Lepidopteran General Odorant Binding Protein," *Insect Biochem. & Molec. Biol.*, **27**, 405-412 (1997).
267. W. Hao, Z. Tan, K. Prasad, K.K. Reddy, J. Chen, G.D. Prestwich, J.R. Falck, S.B. Shears, and E.M. Lafer, "Regulation of AP-3 Function by Inositides: Identification of Phosphatidylinositol 3,4,5-Trisphosphate as a Potent Ligand," *J. Biol. Chem.*, **272**, 6393-6398 (1997).
268. E. Tall, G. Dormán, P. Garcia, L. Runnels, S. Shah, J. Chen, A.A. Profit, Q.-M. Gu, A. Chaudhary, G.D. Prestwich, and M.J. Rebecchi, "Phosphoinositide Binding Specificity Among Phospholipase C Isozymes as Determined by Photo-Cross-Linking to Novel Substrate and Product Analogs," *Biochemistry*, **36**, 7239-7248 (1997).
269. L.A. Flanagan, C.C. Cunningham, J. Chen, G.D. Prestwich, K.S. Kosik, and P.A. Janmey, "The Structure of Divalent Cation-Induced Aggregates of PIP<sub>2</sub> and Their Alteration by Gelsolin and Tau," *Biophys. J.*, **73**, 1440-1447 (1997).
270. X. Zhang, J.C. Loijens, I.V. Boronenkov, G.J. Parker, F.A. Norris, J. Chen, O. Thum, G.D. Prestwich, P.W. Majerus, and R.A. Anderson, "Phosphatidylinositol-4-phosphate 5-Kinase Isozymes Catalyze the Synthesis of 3-Phosphate-containing Phosphatidylinositol Signaling Molecules," *J. Biol. Chem.*, **272**, 17756-17761 (1997).
271. A. Chaudhary and G.D. Prestwich, "Photoaffinity Analogue for the Anti-inflammatory Drug  $\alpha$ -Trinositol: Synthesis and Identification of Putative Molecular Targets," *Bioconjugate Chem.*, **8**, 680-685 (1997).
272. A. Chaudhary, B. Mehrotra, and G.D. Prestwich, "Rapid Purification of Reporter Group-Tagged-Inositol Hexakisphosphate on Ion Exchange Membrane Adsorbers," *BioTechniques*, **23**, 427-430 (1997).
273. T.J.S. Merritt, S. LaForest, G.D. Prestwich, J.M. Quattro, and R. G. Vogt, "Patterns of Gene Duplication in Lepidopteran Pheromone Binding Proteins," *J. Mol. Evol.*, **46**, 272-276 (1998).
274. K.P. Vercruyssen, D.M. Marecak, J.F. Marecek, and G.D. Prestwich, "Synthesis and *In vitro* Degradation of New Polyvalent Hydrazide Cross-Linked Hydrogels of Hyaluronic Acid," *Bioconjugate Chem.*, **8**, 686-694 (1997).
275. D.M. Marecak, Y. Horiuchi, H. Arai, M. Shimonaga, Y. Maki, T. Koyama, K. Ogura, and G.D. Prestwich, "Benzoylphenoxy Analogs of Isoprenoid Diphosphates as Photoactivatable Substrates For Bacterial Prenyltransferases," *Bioorg. Med. Chem. Lett.*, **7**, 1973-1978 (1997).
276. J.T. Elliott, R.A. Jurenka, G.D. Prestwich, and W.L. Roelofs, "Identification of Soluble Binding Proteins for an Insect Neuropeptide," *Biochem. Biophys. Res. Commun.*, **238**, 925-930 (1997).

277. I. Abe, T. Dang, Y.F. Zheng, B.A. Madden, C. Feil, K. Poralla, and G. D. Prestwich, "Cyclization of (3S)29-Methylidene-2,3-oxidosqualene by Bacterial Squalene:Hopene Cyclase: Irreversible Enzyme Inactivation and Isolation of an Unnatural Dammarenoid," *J. Am. Chem. Soc.*, **119**, 11333-11334 (1997).
278. B. J. Robustell, I. Abe, and G.D. Prestwich, "Synthesis and Enzymatic Cyclization of (3S)11-Fluoro-2,3-oxidosqualene," *Tetrahedron Lett.*, **39**, 957-960 (1998).
279. A. Chaudhary, J. Chen, Q.-M. Gu, W. Witke, D.J. Kwiatkowski, and G.D. Prestwich, "Probing the Phosphoinositide 4,5-bisphosphate Binding Site of Human Profilin I," *Chem. & Biol.* **5**, 273-281 (1998).
280. I. J. Blader, A.A. Profit, T.R. Jackson, A.F. Greenwood, G.D. Prestwich, and A.B. Theibert, "GCS1, An Arf Guanosine Triphosphatase Protein In *Saccharomyces cerevisiae*, Is Required for Normal Actin Cytoskeletal Organization *In Vivo* and Stimulates Actin Polymerization *In Vitro*," *Molec. Biol. Cell*, **10**, 581-596 (1999).
281. A. Chaudhary, Q.-M. Gu, O. Thum, A.A. Profit, Y. Qing, L. Jeyakumar, S. Fleischer, and G.D. Prestwich, "Specific Interaction of Golgi Coatomer  $\alpha$ -COP with Phosphatidylinositol 3,4,5-Trisphosphate," *J. Biol. Chem.*, **273**, 8344-8350 (1998).
282. E. Darrouzet, B. Mauchamp, G. D. Prestwich, L. Kerhoas, I. Ujváry, and F. Couillaud, "Hydroxy Juvenile Hormones: New Putative Juvenile Hormones Biosynthesized by Locust Corpora Allata *in Vitro*," *Biochem. Biophys. Res. Commun.*, **240**, 752-758 (1997).
283. J. Chen and G.D. Prestwich, "Asymmetric Synthesis of Water-Soluble, Nonhydrolyzable Phosphonate Analogue of Phosphatidylinositol 4,5-Bisphosphate," *J. Org. Chem.*, **63**, 430-431 (1998).
284. K.F. Tolias, L.E. Rameh, H. Ishihara, Y. Shibasaki, J. Chen, G.D. Prestwich, L.C. Cantley, and C.L. Carpenter, "Type I Phosphatidylinositol-4-phosphate 5-Kinases Synthesize the Novel Lipids Phosphatidylinositol 3,5-Bisphosphate and Phosphatidylinositol 5-Phosphate," *J. Biol. Chem.*, **273**, 18040-18046 (1998).
285. S.-H. Chung, W.-J. Song, K. Kim, J.J. Bednarski, J. Chen, G.D. Prestwich, and R.W. Holz, "The C2 Domains of Rabphilin3A Specifically Bind Phosphatidylinositol 4,5-Bisphosphate Containing Vesicles in a  $Ca^{2+}$ -dependent Manner: *In Vitro* Characteristics and Possible Physiological Significance," *J. Biol. Chem.*, **273**, 10240-10248 (1998).
286. Y.F. Zheng, I. Abe, and G.D. Prestwich, "Inhibition Kinetics and Affinity Labeling of Bacterial Squalene:Hopene Cyclase by Thia-Substituted Analogs of 2,3-Oxidosqualene," *Biochemistry*, **37**, 5981-5987 (1998).
287. S. Debernard, C. Morisseau, T.F. Severson, L. Feng, H. Wojtasek, G.D. Prestwich, and B.D. Hammock, "Expression and Characterization of the Recombinant Juvenile Hormone Epoxide Hydrolase (JHEH) from *Manduca sexta*," *Insect Biochem. & Molec. Biol.*, **28**, 409-419 (1998).
288. K.P. Vercruyse and G.D. Prestwich, "Hyaluronate Derivatives in Drug Delivery," *Crit. Rev. Ther. Drug Carr. Syst.*, **15**, 513-555 (1998).

289. Y.F. Zheng, I. Abe, and G.D. Prestwich, "Inactivation of Two Triterpene Cyclases by 18(E)-(3S)-29-Methylidene-2,3-oxidosqualene," *J. Org. Chem.*, **63**, 4872-4873 (1998).
290. I. Abe, Y.F. Zheng, and G.D. Prestwich, "Photoaffinity Labeling of Oxidosqualene Cyclase and Squalene Cyclase by a Benzophenone-Containing Inhibitor," *Biochemistry*, **37**, 5779-5784 (1998).
291. G.D. Prestwich and K.P. Vercruyse, "Therapeutic Applications of Hyaluronic Acid and Hyaluronan Derivatives," *Pharmaceut. Sci. & Technol. Today*, **1**, 42-43 (1998).
292. K.M. Loyet, J.A. Kowalchuk, A. Chaudhary, J. Chen, G.D. Prestwich, and T.F.J. Martin, "Specific Binding of Phosphatidylinositol 4,5-Bisphosphate to Calcium-dependent Activator Protein for Secretion (CAPS), a Potential Phosphoinositide Effector Proteins for Regulated Exocytosis," *J. Biol. Chem.*, **273**, 8337-8343 (1998).
293. J. Peng and G.D. Prestwich, "Synthesis of L- $\alpha$ -Phosphatidyl-D-*myo*-inositol 5-Phosphate and L- $\alpha$ -Phosphatidyl-D-*myo*-inositol 3,5-Bisphosphate," *Tetrahedron Lett.*, **39**, 3965-3968 (1998).
294. A.A. Profit, J. Chen, Q.-M. Gu, A. Chaudhary, K. Prasad, E.M. Lafer, and G.D. Prestwich, "Probing the Phosphoinositide Binding Site of the Clathrin Assembly Protein AP-2 with Photoaffinity Labels," *Arch. Biochem. Biophys.*, **357**, 85-94 (1998).
295. I. Abe and G.D. Prestwich, "Development of New Cholesterol-Lowering Drugs," *Drug Discovery Today (Monitor)*, **3**, 389-390 (1998).
296. I. Abe, Y.F. Zheng, and G.D. Prestwich, "Mechanism-Based Inhibitors and Other Active-Site Targeted Inhibitors of Oxidosqualene Cyclase and Squalene Cyclase," *J. Enzyme Inhibition*, **13**, 385-398 (1998).
297. M.A. Kearns, D.E. Monks, M. Fang, M.P. Rivas, P.D. Courtney, J. Chen, G.D. Prestwich, A.B. Theibert, R.E. Dewey, and V.A. Bankaitis, "Novel Developmentally Regulated Phosphoinositide Binding Proteins from Soybean Whose Expression Bypasses the Requirement for an Essential Phosphatidylinositol Transfer Protein in Yeast," *EMBO J.*, **17**, 4004-4017 (1998).
298. J. Chen, L. Feng, and G.D. Prestwich, "Asymmetric Total Synthesis of Diacyl- and Head Group-Modified Phosphatidylinositol 3-Phosphate and 4-Phosphate Derivatives," *J. Org. Chem.*, **63**, 6511-6522 (1998).
299. Y.-W. Zhang, T. Koyama, D.M. Marecak, G.D. Prestwich, Y. Maki, and K. Ogura, "Two Subunits of Heptaprenyl Diphosphate Synthase of *Bacillus subtilis* Form a Catalytically Active Complex," *Biochemistry*, **37**, 13411-13420 (1998).
300. G.D. Prestwich, I. Abe, Y.F. Zheng, B.J. Robustell, and T. Dang, "Enzymatic Cyclization of Squalene Analogs," *Pure Appl. Chem.*, **71**, 1127-1131 (1999).
301. E.K.J. Tuominen, J.M. Holopainen, J. Chen, G.D. Prestwich, P.R. Bachiller, P.K.J. Kinnunen, and P.A. Janmey, "Fluorescent Phosphoinositide Derivatives Reveal Specific Binding of Gelsolin and Other Actin Regulatory Proteins to Mixed Lipid Bilayers," *Eur. J. Biochem.*, **263**, 85-92 (1999).

302. H.M. Bömmel, A. Reif, L.G. Fröhlich, A. Frey, H. Hofmann, D.M. Marecak, V. Groehn, P. Kotsonis, M. Meinecke, M. Bernhardt, M. Weeger, O. Klingler, G.D. Prestwich, W. Pfeleiderer, and H.H.H.W. Smith, "Anti-pterins as Tools to Characterize the Function of Tetrahydrobiopterin in NO Synthase," *J. Biol. Chem.*, **273**, 33142-33149 (1998).
303. B.J. Robustell, I. Abe, and G.D. Prestwich, "Synthesis and Enzymatic Cyclization of (3S)-14-Fluoro-2,3-oxidosqualene," *Tetrahedron Lett.*, **39**, 9385-9388 (1998).
304. J.T. Elliott, W.J. Hoekstra, B.E. Maryanoff, and G.D. Prestwich, "Photoactivatable Peptides Based on BMS-197525, A Potent Antagonist of the Human Thrombin Receptor (PAR-1)," *Bioorg. Med. Chem. Lett.*, **9**, 279-284 (1999).
305. L. Collis, C. Hall, L. Lange, M.R. Ziebell, G.D. Prestwich, and E.A. Turley, "Rapid Hyaluronan Uptake is Associated with Enhanced Motility: Implications for an Intracellular Mode of Action," *FEBS Lett.*, **440**, 444-449 (1998).
306. H.P. Bayley and G.D. Prestwich, "Une Liaison Dangereuse: The Lasting Affair Between Chemistry and Biology," *Curr. Opin. Chem. Biol.*, **3**, 61-63 (1999).
307. Q. Yan, G.D. Prestwich, and W.J. Lennarz, "The Ost1p Subunit of Yeast Oligosaccharyl Transferase Recognizes the Peptide Glycosylation Site Sequence, -Asn-X-Ser/Thr-," *J. Biol. Chem.*, **274**, 5021-5025 (1999).
308. S.M. LaForest, G.D. Prestwich, and C. Löfstedt, "Intraspecific Nucleotide Variation at the Pheromone Binding Protein Locus in the Turnip Moth, *Agrotis segetum*," *Insect Mol. Biol.* **8**, 481-490 (1999).
309. T. Dang, I. Abe, Y.F. Zheng, and G.D. Prestwich, "The Binding Site for an Inhibitor of Squalene:Hopene Cyclase Determined Using Photoaffinity Labeling and Molecular Modeling," *Chem. & Biol.*, **6**, 333-341 (1999).
310. K.P. Vercruyse, M.R. Ziebell, and G.D. Prestwich, "Control of Enzymatic Degradation of Hyaluronan by Divalent Cations," *Carbohydr. Res.*, **318**, 26-37 (1999).
311. B. Ganem, Y. Dong, Y.F. Zheng, and G.D. Prestwich, "Amidrazone and Amidoxime Inhibitors of Squalene Hopene Cyclase," *J. Org. Chem.*, **64**, 5441-5446 (1999).
312. S.M. Jones, R. Klinghoffer, G.D. Prestwich, A. Toker, and A. Kazlauskas, "PDGF Induces an Early and a Late Wave of PI 3-Kinase Activity, and Only the Late Wave is Required for Progression Through G1," *Curr. Biol.*, **9**, 512-521 (1999).
313. C.L. Thomas, J. Steel, G.D. Prestwich, and G. Schiavo, "Generation of Phosphatidylinositol-specific Antibodies and Their Characterization," *Biochem. Soc. Trans.*, **27**, 648-652 (1999).
314. Y. Luo and G.D. Prestwich, "Synthesis and Cytotoxicity of a Hyaluronic Antitumor Bioconjugate," *Bioconjugate Chem.*, **10**, 755-763 (1999).
315. M. Mason, K.P. Vercruyse, K.R. Kirker, R. Frisch, D.M. Marecak, G.D. Prestwich, and W.G. Pitt, "Hyaluronic Acid-Modified Polypropylene, Polystyrene, and Polytetrafluoroethylene," *Biomaterials*, **21**, 31-36 (2000).

316. B. Sims, D. Mahnke-Zizelman, A.A. Profit, G.D. Prestwich, R.L. Sabina, and A.B. Theibert, "Regulation of AMP Deaminase by Phosphoinositides," *J. Biol. Chem.*, **274**, 25701-25707 (1999).
317. G. Dormán and G.D. Prestwich, "Using Photolabile Ligands in Drug Discovery and Development," *Trends in Biotechnology*, **18**, 64-77 (2000).
318. V.A. Sciorra, S.A. Rudge, G.D. Prestwich, M.A. Frohman, J. Engebrecht, and A.J. Morris, "Identification of a Phosphoinositide Binding Motif that Mediates Activation of Yeast and Mammalian Phospholipase D Isoenzymes," *EMBO J.*, **20**, 5911-5921 (1999).
319. V.R. Rao, M.N. Corradetti, J. Yuan, J. Chen, J. Peng, J. Yuan, G.D. Prestwich, and J.S. Brugge, "Expression Cloning of Protein Targets for 3-Phosphorylated Phosphoinositides," *J. Biol. Chem.*, **274**, 37893-37900 (1999).
320. Y. Luo, M.R. Ziebell, and G.D. Prestwich, "A Hyaluronic Acid - Taxol<sup>®</sup> Antitumor Bioconjugate Targeted to Cancer Cells," *Biomacromolecules*, **1**, 208-218 (2000).
321. T. Rochács, J. Chen, G.D. Prestwich, and D.E. Logothetis, "Distinct Specificities of Inwardly Rectifying K<sup>+</sup> Channels for Phosphoinositides," *J. Biol. Chem.*, **274**, 36065-36072 (1999).
322. A. Arbusova, K. Martushova, G. Hangyas-Mihalyne, A.J. Morris, S. Ozaki, G.D. Prestwich, and S. McLaughlin, "Fluorescently Labeled Neomycin as a Probe of Phosphatidylinositol-4,5-Bisphosphate in Membranes," *Biochim. Biophys. Acta*, **1464**, 35-48 (2000).
323. J.A. Greenwood, A.B. Theibert, G.D. Prestwich, and J.E. Murphy-Ullrich, "Restructuring of Focal Adhesion Plaques by PI-3 Kinase: Regulation by PtdIns(3,4,5)P<sub>3</sub> Binding to  $\alpha$ -Actinin," *J. Cell Biol.*, **150**, 627-641 (2000).
324. J. Peng, P.Y. Chen, R.B. Marchase, and G.D. Prestwich, "Preparation and Use of a Photoactivatable Glucose-6-Phosphate Analogue," *Bioorg. Med. Chem. Lett.*, **10**, 535-539 (2000).
325. R.W. Holz, M.D. Hlubek, S.D. Sorenson, S.K. Fisher, T. Balla, S. Ozaki, G.D. Prestwich, E.L. Stuenkel, and M.A. Bittner, "A Pleckstrin Homology Domain Specific for PtdIns-4,5-P<sub>2</sub> and Fused to Green Fluorescent Protein Identifies Plasma Membrane PtdIns-4,5-P<sub>2</sub> as Being Important in Exocytosis," *J. Biol. Chem.*, **275**, 17878-17885 (2000).
326. B. Mehrotra, D.G. Myszka, and G.D. Prestwich, "Binding Kinetics and Ligand Specificity for the Interactions of the C2B Domain of Synaptogmin II with Inositol Polyphosphates and Phosphoinositides," *Biochemistry*, **39**, 9679-9686 (2000).
327. X.-h. Liu, H.-k. Wang, J.N. Herron, and G.D. Prestwich, "Photopatterning of Antibodies on Biosensors," *Bioconjugate Chem.*, **11**, 755-761 (2000).
328. J.T. Elliott and G.D. Prestwich, "Maleimide-Functionalized Lipids that Anchor Polypeptides to Lipid Bilayers and Membranes," *Bioconjugate Chem.*, **11**, 832-841 (2000).
329. E. Plettner, J. Lazar, E. G. Prestwich, and G. D. Prestwich, "Discrimination of Pheromone Enantiomers by Two Pheromone Binding Proteins from the Gypsy Moth, *Lymantria dispar*," *Biochemistry*, **39**, 8953-8962 (2000).

330. D.B. DeWald, H. Hama, C. Jones, J. Thompson, A. Cangelosi, and G.D. Prestwich, "Rapid Accumulation of Phosphatidylinositol 4,5-Bisphosphate and Inositol 1,4,5-Trisphosphate Correlates with Calcium Mobilization in Salt-Stressed *Arabidopsis*," *Plant Physiol.*, **126**, 759-769 (2001).
331. S. Ozaki, D.B. DeWald, J.C. Shope, J. Chen, and G.D. Prestwich, "Intracellular Delivery of Phosphoinositides and Inositol Phosphates using Polyamine Carriers," *Proc. Natl. Acad. Sci., USA*, **97**, 11286-11291 (2000).
332. H.-K. Lee, P. Denner-Ancona, J. Sakakibara, T. Ono, and G.D. Prestwich, "Photoaffinity Labeling and Site-Directed Mutagenesis of Rat Squalene Epoxidase," *Arch. Biochem. Biophys.*, **381**, 43-52 (2000).
333. Y. Luo, K.R. Kirker, and G.D. Prestwich, "Cross-Linked Hyaluronic Acid Hydrogel Films: New Biomaterials for Drug Delivery," *J. Controlled Rel.*, **69**, 169-184 (2000).
334. T. Dang and G.D. Prestwich, "Site-directed Mutagenesis of Squalene-Hopene Cyclase: Altered Substrate Specificity and Product Distribution," *Chem. & Biol.*, **7**, 643-649 (2000).
335. A.J. Day and G.D. Prestwich, "Hyaluronan-binding Proteins: Tying Up the Giant," *J. Biol. Chem.*, **277**, 4585-4588 (2002).
336. G.D. Prestwich, "Biomaterials from Chemically-Modified Hyaluronan," *Glycoforum* <http://glycoforum.gr.jp/science/hyaluronan/HA18/HA18E.html> (2001).
337. J.T. Elliott, W.J. Hoekstra, C.K. Derian, D.G. Ahern, M.F. Addo, B.E. Maryanoff, and G.D. Prestwich, "Tritiated Photoactivatable Analogs of the Native Human Thrombin Receptor (PAR-1) Agonist Peptide, SFLLRN-NH<sub>2</sub>," *J. Peptide Res.*, **57**, 494-506 (2001).
338. L. Feng, M. Mejillano, H.L. Yin, J. Chen, and G.D. Prestwich, "Full-Contact Domain Labeling: Identification of a Novel Phosphoinositide Binding Site on Gelsolin That Requires the Complete Protein," *Biochemistry*, **40**, 904-913 (2001).
339. S.S. Davies, A.V. Pontsler, G.K. Marathe, K.A. Harrison, R.C. Murphy, J.C. Hinshaw, G.D. Prestwich, A. St. Hilaire, S.M. Prescott, G.A. Zimmerman, and T.M. McIntyre, "Oxidized Alkyl Phospholipids are Specific, High Affinity Peroxisome Proliferator-activated Receptor  $\gamma$  Ligands and Agonists," *J. Biol. Chem.*, **276**, 16015-16023 (2001).
340. Y. Luo and G.D. Prestwich, "Novel Biomaterials for Drug Delivery," *Exp. Opin. Ther. Patents*, **11**, 1395-1410 (2001).
341. M.R. Ziebell, Z.-G. Zhao, B. Luo, Y. Luo, E.A. Turley, and G.D. Prestwich, "Peptides that Mimic Glycosaminoglycans: High Affinity Ligands for A Hyaluronan Binding Domain," *Chem. & Biol.*, **8**, 1081-1084 (2001).
342. Y. Luo and G.D. Prestwich, "Hyaluronic Acid-*N*-Hydroxysuccinimide: A Useful Intermediate for Bioconjugation," *Bioconjugate Chem.*, **12**, 1085-1088 (2001).
343. X.-h. Liu and G.D. Prestwich, "Didehydrogeranylgeranyl ( $\Delta\Delta$ GG): A Fluorescent Probe for Protein Prenylation," *J. Am. Chem. Soc.*, **124**, 20-21 (2002).

344. E.L. Chaikof, H. Matthew, J. Kohn, A.G. Mikos, G.D. Prestwich, and C.M. Yip, "Biomaterials and Scaffolds in Reparative Medicine," *Ann. New York Acad. Sci.*, **961**, 96-105 (2002).
345. G.D. Prestwich and H. Matthew, "Hybrid, Composite, and Complex Biomaterials," *Ann. New York Acad. Sci.*, **961**, 106-108 (2002).
346. Y. Luo, N.J. Bernshaw, Z.-R. Lu, J. Kopecek, and G.D. Prestwich, "HPMA Copolymer-Hyaluronan-Doxorubicin Bioconjugates: Targeted Delivery of an Anti-cancer Agent," *Pharm. Res.*, **19**, 396-402 (2002).
347. M.P. Scheid, M. Huber, J.E. Damen, M. Hughes, V.H. Kang, P.O. Nielsen, G.D. Prestwich, G. Krystal, and V. Duronio, "Phosphatidylinositol(3,4,5)P<sub>3</sub> is Essential But Not Sufficient for PKB Activation: Phosphatidylinositol(3,4)P<sub>2</sub> is Required for PKB Phosphorylation at Ser473. Studies Using Cells from SHIP Knockout Mice," *J. Biol. Chem.*, **277**, 9027-9035 (2002).
348. M.D. Muniruzzaman, A. Marin, Y. Luo, G.D. Prestwich, W.G. Pitt, G. Hussein, and N.Y. Rapoport, "Intracellular Uptake of Pluronic Copolymer: Effect of the Aggregation State," *Colloids and Surfaces B: Biointerfaces*, **25**, 233-241 (2002).
349. Y. Luo and G.D. Prestwich, "Cancer-Targeted Polymeric Drugs," *Curr. Cancer Drug Targ.*, **2**, 209-226 (2002).
350. G.D. Prestwich, R. Chen, L. Feng, S. Ozaki, C.G. Ferguson, B.E. Drees, D.W. Neklason, M.J. Mostert, P.A. Porter-Gill, V.H. Kang, J.C. Shope, P.O. Nielsen, and D.B. DeWald, "In Situ Detection of Phospholipid and Phosphoinositide Metabolism," *Advan. Enzyme Regul.*, **42**, 19-38 (2002).
351. M.D. Muniruzzaman, N.Y. Rapoport, A. Marin, Y. Luo, and G.D. Prestwich, "Intracellular Uptake and Trafficking of Pluronic Micelles in Drug-Sensitive and MDR Cells: Effect on the Intracellular Drug Localization," *J. Pharm. Sci.*, **91**, 157-170 (2002).
352. G.S. Kular, A. Chaudhary, G.D. Prestwich, P. Swigart, S. Cockcroft, and R. Wetzker, "Co-operation of Phosphatidylinositol Transfer Protein with Phosphoinositide 3-Kinase  $\gamma$  in the Generation of 3-Phosphorylated Inositol Lipids," *Advan. Enzyme Regul.* **42**, 53-61 (2002).
353. R. Chen, V.H. Kang, J. Chen, J.C. Shope, J. Torabinejad, D.B. DeWald, and G.D. Prestwich, "A Monoclonal Antibody to Visualize PtdIns(3,4,5)P<sub>3</sub> in Cells," *J. Histochem. Cytochem.*, **50**, 697-708 (2002).
354. K.R. Kirker, Y. Luo, J.H. Nielson, J. Shelby, and G.D. Prestwich, "Glycosaminoglycan Hydrogel Films as Biointeractive Dressings for Wound Healing," *Biomaterials*, **23**, 3661-3671 (2002).
355. P. Whitley, A.M. Gibbard, F. Koumanov, S. Oldfield, E.E. Kilgour, G.D. Prestwich, and G.D. Holman, "Identification of Centaurin- $\alpha$ 2: A Phosphatidylinositide-Binding Protein Present in Fat, Heart, and Skeletal Muscle," *Eur. J. Cell. Biol.*, **81**, 222-230 (2002).

356. M.E. Rauch, C.G. Ferguson, G.D. Prestwich, and D.S. Cafiso, "Myristoylated Alanine-rich C Kinase Substrate (MARCKS) Sequesters Spin-labeled Phosphatidylinositol 4,5-Bisphosphate in Lipid Bilayers," *J. Biol. Chem.*, **277**, 14068-14076 (2002).
357. X. Li, M.P. Rivas, M. Fang, J. Marchena, B. Mehrotra, A. Chaudhary, L. Feng, G.D. Prestwich, and V.A. Bankaitis, "Analysis of Oxysterol Binding Protein Homologue Kes1p Function in Regulation of Sec14p-dependent Protein Transport from the Yeast Golgi Complex," *J. Cell Biol.*, **157**, 63-77 (2002).
358. P.W. Rzepecki and G.D. Prestwich, "Synthesis of Hybrid Lipid Probes: Derivatives of Phosphatidylethanolamine-Extended Phosphatidylinositol 4,5-Bisphosphate (Pea-PIP<sub>2</sub>)," *J. Org. Chem.*, **67**, 5454-5460 (2002).
359. O.D. Weiner, P.O. Neilsen, G.D. Prestwich, M.W. Kirschner, L.C. Cantley, and H.R. Bourne, "A PI(3,4,5)P<sub>3</sub>/Rho GTPase Positive Feedback Loop Regulates Neutrophil Polarity," *Nature Cell Biol.*, **4**, 509-513 (2002).
360. K.P. Vercruyse, H. Li, Y. Luo, and G.D. Prestwich, "Thermosensitive Lanthanide Complexes of Hyaluronan," *Biomacromolecules*, **3**, 639-643 (2002).
361. L. Feng, K. Manabe, J.C. Shope, S. Widmer, D.B. DeWald, and G.D. Prestwich, "A Real-Time Fluorogenic Phospholipase A<sub>2</sub> Assay for Biochemical and Cellular Activity Measurements," *Chem. & Biol.*, **9**, 795-803 (2002).
362. X. Z. Shu, Y. Liu, Y. Luo, M.C. Roberts, and G.D. Prestwich, "Disulfide Crosslinked Hyaluronan Hydrogels," *Biomacromolecules*, **3**, 1304-1311 (2002).
363. Y. Xu and G.D. Prestwich, "Concise Synthesis of Acyl Migration-Blocked 1,1-Difluorinated Analogues of Lysophosphatidic Acid," *J. Org. Chem.*, **67**, 7158-7161 (2002).
364. J. Lazar, D.R. Greenwood, L.E.L. Rasmussen, and G.D. Prestwich, "Molecular and Functional Characterization of the Odorant Binding Protein of the Asian Elephant, *Elephas maximus*: Implications for the Role of Lipocalins in Mammalian Olfaction," *Biochemistry*, **41**, 11786-11794 (2002).
365. C. Picart, J. Mutterer, L. Richert, Y. Luo, G.D. Prestwich, P. Schaaf, J.-C. Voegel, and P. Lavalle, "Molecular Basis for the Explanation of the Exponential Growth of Polyelectrolyte Multilayers," *Proc. Natl. Acad. Sci., USA*, **99**, 12531-12535 (2002).
366. Y. Xu and G.D. Prestwich "Synthesis of Chiral ( $\alpha,\alpha$ -Difluoroalkyl)phosphonate Analogues of (Lyso)phosphatidic Acid *via* Hydrolytic Kinetic Resolution," *Organic Lett.*, **4**, 4021-4024 (2002).
367. M. Inoue, Y. Sakamoto, N. Fujishiro, I. Imanaga, S. Ozaki, G.D. Prestwich and A. Warashina, "Homogeneous Ca<sup>2+</sup> Stores in Rat Adrenal Chromaffin Cells," *Cell Calcium*, **33**, 19-26 (2003).



368. T.M. McIntyre, A.V. Pontstler, A.R. Silva, A. St. Hilaire, Y. Xu, J.C. Hinshaw, G.A. Zimmerman, K. Hama, J. Aoki, H. Arai, and G.D. Prestwich, "Identification of an Intracellular Receptor for Lysophosphatidic Acid (LPA): LPA is a Transcellular PPAR $\gamma$  Agonist," *Proc. Natl. Acad. Sci., USA*, **100**, 131-136 (2003).
369. O. Gozani, P. Karuman, D.R. Jones, D. Ivanov, J. Cha, A.A. Lugovskoy, C.L. Baird, H. Zhu, S.J. Field, S.L. Lessnick, J. Villasenor, B. Mehrotra, J. Chen, V.R. Rao, J.S. Brugge, C.G. Ferguson, B. Payrastra, D.G. Myszka, L.C. Cantley, G. Wagner, N Divecha, G.D. Prestwich, and J. Yuan, "The PHD Finger of the Chromatin-Associated Protein ING2 Functions as a Nuclear Phosphoinositide Receptor," *Cell*, **114**, 99-111 (2003).
370. J.R. Couchman, S. Vogt, S.-T. Lim, Y. Lim, E.-S. Oh, G.D. Prestwich, A. Theibert, W. Lee, and A. Woods, "Regulation of Inositol Phospholipid Binding and Signaling Through Syndecan-4," *J. Biol. Chem.*, **277**, 49296-49303 (2002).
371. D.McV. Ward, S.L. Shiflett, D. Huynh, M.B Vaughn, G. Prestwich, and J. Kaplan, "Use of Expression Constructs to Dissect the Functional Domains of the CHS/Beige Protein: Identification of Multiple Phenotypes," *Traffic* 2003, **4**, 403-415 (2003).
372. X.Z. Shu, Y. Liu, F. Palumbo, and G.D. Prestwich, "Disulfide-Crosslinked Hyaluronan-Gelatin Hydrogel Films: A Covalent Mimic of the Extracellular Matrix for in vitro Cell Growth," *Biomaterials*, **24**, 3825-3834 (2003).
373. B.E. Drees, A. Weipert, H. Hudson, C.G. Ferguson, L. Chakravarty, and G.D. Prestwich, "Competitive Fluorescence Polarization Assays for the Detection of Phosphoinositide Kinase and Phosphatase Activity," *Comb. Chem. High Throughput Scree.n*, **6**, 321-330 (2003).
374. Y. Liu, X.Z. Shu, S.D. Gray, and G.D. Prestwich, "Disulfide-Crosslinked Hyaluronan-Gelatin Sponge: Growth of Fibrous Tissue *in vivo*," *J. Biomed. Mater. Res.*, **68A**, 142-149 (2004).
375. W.G. Pitt, R.N. Morris, M.L. Mason, M.W. Hall, Y. Luo, and G.D. Prestwich, "Attachment of Hyaluronic Acid to Metallic Surfaces," *J. Biomed. Mater. Res.*, **68A**, 95-106 (2004).
376. N. Honson, M.A. Johnson, J.E. Oliver, G.D. Prestwich, and E. Plettner, "Structure-Activity Studies with Pheromone-binding Proteins of the Gypsy Moth, *Lymantria dispar*," *Chem. Senses*, **28**, 479-489 (2003).
377. Y. Xu, L. Qian, and G. D. Prestwich, "Synthesis of Monofluorinated Analogues of Lysophosphatidic Acid," *J. Org. Chem.*, **68**, 5320-5330 (2003).
378. K.R. Kirker, Y. Luo, S.E. Morris, J. Shelby, and G.D. Prestwich, "Glycosaminoglycan Hydrogels as Supplemental Wound Dressings for Donor Sites," *J. Burn Care Rehabil.*, **25**, 276-286 (2004).
379. Y. Xu, L. Qian, and G.D. Prestwich, "Synthesis of  $\alpha$ -Fluorinated Phosphonates from  $\alpha$ -Fluorovinylphosphonates: A New Route to Analogues of Lysophosphatidic Acid," *Organic Lett.*, **5**, 2267-2270 (2003).

380. F. Lemtiri-Chlieh, E.A.C. MacRobbie, A.A.R. Webb, N.F. Manison, C. Brownlee, J.N. Skepper, J. Chen, G.D. Prestwich, and C.A. Brearley, "Inositol Hexakisphosphate Mobilizes an Endomembrane Store of Calcium in Guard Cells," *Proc. Natl. Acad. Sci., USA*, **100**, 10091-10095 (2003).
381. J.C. Hinshaw, D.-Y. Suh, P. Garnier, F.S. Buckner, R.T. Eastman, S.P.T. Matsuda, B.M. Joubert, I. Coppens, K.A. Joiner, S. Merali, T.E. Nash, and G.D. Prestwich, "Oxidosqualene Cyclase Inhibitors as Antimicrobial Agents," *J. Med. Chem.*, **46**, 4240-4243 (2003).
382. S.S. Smyth, V.A. Sciorra, Y.J. Sigal, Z. Pamuklar, Z. Wang, Y. Xu, G.D. Prestwich, and A.J. Morris, "Lipid Phosphate Phosphatases Regulate Lysophosphatidic Acid Production and Signaling in Platelets," *J. Biol. Chem.*, **278**, 43214-43223 (2003).
383. H. Zhang, X.-h. Liu, K. Zhang, C.-K. Chen, J.M. Frederick, G.D. Prestwich, and W. Baehr, "Photoreceptor cGMP Phosphodiesterase  $\delta$  Subunit (PDE $\delta$ ) Functions as a Prenyl-binding Protein," *J. Biol. Chem.*, **279**, 407-413 (2004).
384. X.Z. Shu, Y. Liu, F. Palumbo, Y. Luo, and G.D. Prestwich, "In situ Crosslinkable Hyaluronan Hydrogels for Tissue Engineering," *Biomaterials*, **25**, 1339-1348 (2004).
385. X.Z. Shu, K. Ghosh, Y. Liu, F.S. Palumbo, Y. Luo, R.A. Clark, and G.D. Prestwich, "Attachment and Spreading of Fibroblasts on an RGD Peptide-Modified Injectable Hyaluronan Hydrogel," *J. Biomed. Mat. Res.*, **68A**, 365-375 (2003).
386. L. Feng, G.B. Mills, and G.D. Prestwich, "Modulators of Lysophosphatidic Acid Signalling," *Expert Opin. Ther. Patents*, **13**, 1619-1634 (2003).
387. T.G. Kutateladze, D.G.S. Capelluto, C.G. Ferguson, M.L. Cheever, A.G. Kutateladze, G.D. Prestwich, and M. Overduin, "Multivalent Mechanism of Membrane Insertion by the FYVE Domain," *J. Biol. Chem.*, **279**, 3050-3057 (2004).
388. R.A. Peattie, A.P. Nayate, M.A. Firpo, J. Shelby, R.J. Fisher, and G.D. Prestwich, "Stimulation of *In Vivo* Angiogenesis by Cytokine-loaded Hyaluronic Acid Hydrogel Implants," *Biomaterials*, **25**, 2789-2798 (2004).
389. L. Qian, Y. Xu, H. Arai, J. Aoki, T.M. McIntyre, and G.D. Prestwich, "Synthesis of Migration-Resistant Hydroxyethoxy Analogues of Lysophosphatidic Acid," *Org. Lett.*, **5**, 4685-4688 (2003).
390. L. Qian, Y. Xu, Y. Hasegawa, J. Aoki, G.B. Mills, and G.D. Prestwich, "Enantioselective Responses to a Phosphorothioate Analogue of Lysophosphatidic Acid with LPA<sub>3</sub> Receptor-Selective Agonist Activity," *J. Med. Chem.*, **46**, 5575-5578 (2003).
391. S. Cai, J.L. Dufner-Beattie, and G.D. Prestwich, "A Selective Protein Sensor for Heparin Detection," *Analyt. Biochem.*, **326**, 33-41 (2004).
392. Y. Xu, L. Qian, A.V. Pontsler, T.M. McIntyre, and G.D. Prestwich, "Synthesis of Difluoromethyl Substituted Lysophosphatidic Acid Analogues," *Tetrahedron*, **60**, 43-49 (2004).

393. P.Y. Lum, C.D. Armour, S.B. Stepaniants, G. Cavet, M.K. Wolf, J.S. Butler, J.C. Hinshaw, P. Garnier, G.D. Prestwich, A. Leonardson, P. Garrett-Engele, C.M. Rush, M. Bard, G. Schimmack, J.W. Phillips, C.J. Roberts, and D.D. Shoemaker, "Discovering Modes of Action for Therapeutic Compounds Using a Genome-Wide Screen of Yeast Heterozygotes," *Cell*, **116**, 121-137 (2004).
394. G.D. Prestwich, "Visualizing Signalling by Phosphoinositide 3-Kinase Pathway Lipids," *Biochem. Soc. Trans.*, **32**, 336-337 (2004).
395. X.-h. Liu, D.-Y. Suh, J. Call, and G.D. Prestwich, "Antigenic Prenylated Peptide Conjugates and Polyclonal Antibodies to Detect Protein Prenylation," *Bioconjugate Chem.*, **15**, 270-277 (2004).
396. Y. Liu, K. Webb, K.R. Kirker, N.J. Bernshaw, P.A. Tresco, S.D. Gray, and G.D. Prestwich, "Composite Articular Cartilage Engineered on a Chondrocyte-Seeded Aliphatic Polyurethane Sponge," *Tissue Eng.*, **10**, 1084-1092 (2004).
397. H. Zhou, H. Xiong, H. Li, S.E. Plevy, P.D. Walden, M. Sassaroli, G.D. Prestwich, and J.C. Unkeless, "Microtubule-associated serine/threonine Kinase-205 kDa and Fc $\gamma$  Receptor Control IL-12 p40 Synthesis and NF- $\kappa$ B Activation," *J. Immunol.*, **172**, 2559-2568 (2004).
398. M. Umezo-Goto, J. Tanyi, J. Lahad, S. Liu, S. Yu, R. Lapushin, Y. Hasegawa, Y. Lu, R. Trost, T. Bevers, E. Jonasch, K. Aldape, J. Liu, R.D. James, C.G. Ferguson, Y. Xu, G.D. Prestwich, and G.B. Mills, "Lysophosphatidic Acid Production and Action: Validated Targets in Cancer?," *J. Cell. Biochem.*, **92**, 1115-1140 (2004).
399. Y. Xu, Y. Fang, J. Chen, and G.D. Prestwich, "Activation of mTOR Signaling by Novel Fluoromethylene Phosphonate Analogues of Phosphatidic Acid," *Bioorg. Med. Chem. Lett.*, **14**, 1461-1464 (2004).
400. H.-K. Lee, Y.F. Zheng, X.-y. Xiao, M. Bai, J. Sakakibara, T. Ono, and G.D. Prestwich, "Photoaffinity Labeling Identifies the Substrate-Binding Site of Mammalian Squalene Epoxidase," *Biochem. Biophys. Res. Commun.*, **315**, 1-9 (2004).
401. L. Richert, P. Lavalle, E. Payan, X.Z. Shu, G.D. Prestwich, J.-F. Stoltz, P. Schaaf, J.-C. Voegel, and C. Picart, "Layer by Layer Buildup of Polysaccharide Films: Physical Chemistry and Cellular Adhesion Aspects," *Langmuir*, **20**, 448-458 (2004).
402. K.R. Kirker and G.D. Prestwich, "Physical Properties of Glycosaminoglycan Hydrogels," *J. Polym. Sci. Part B: Polym. Phys.*, **42**, 4344-4356 (2004).
403. M.E Gilbert, K.R. Kirker, S.D. Gray, P. Ward, J.G. Szakacs, G.D. Prestwich, and R.R. Orlandi, "Chondroitin Sulfate Hydrogel and Wound Healing in Rabbit Maxillary Sinus Mucosa," *Laryngoscope*, **114**, 1406-1409 (2004).
404. H. Li, Y. Liu, X.Z. Shu, S.D. Gray, and G.D. Prestwich, "Synthesis and Biological Evaluation of a Cross-Linked Hyaluronan-Mitomycin C Hydrogel," *Biomacromolecules*, **5**, 895-902 (2004).

405. X.-h. Liu and G.D. Prestwich, "Didehydrofarnesyl Diphosphate: An Intrinsically Fluorescent Inhibitor of Protein Farnesyltransferase," *Bioorg. Med. Chem. Lett.*, **14**, 2137-2140 (2004).
406. B.E. Drees, G.B. Mills, C. Rommel, and G.D. Prestwich, "Therapeutic Potential of Phosphoinositide 3-Kinase Inhibitors," *Expert Opin. Ther. Patents*, **14**, 703-732 (2004).
407. G.D. Prestwich, "Phosphoinositide Signaling: From Affinity Probes to Pharmaceutical Targets," *Chem. & Biol.*, **11**, 619-637 (2004).
408. C. Zhang, D.L. Baker, S. Yasuda, N. Makarova, L.R. Johnson, L. Balazs, G.K. Marathe, T.M. McIntyre, Y. Xu, G.D. Prestwich, H.-S. Byun, R. Bittman, and G. Tigyi, "Lysophosphatidic Acid Induces Neointima Formation Through PPAR $\gamma$  Activation," *J. Exper. Med.*, **199**, 763-774 (2004).
409. O. Gozani, S.J. Field, C.G. Ferguson, M. Ewalt, C. Mahlke, L.C. Cantley, G.D. Prestwich, and J. Yuan, "Modification of Protein Sub-nuclear Localization by Synthetic Phosphoinositides: Evidence for Nuclear Phosphoinositide Signaling Mechanisms," *Advan. Enzyme Regul.*, **45**, 171-185 (2005).
410. Q. Chen, S. Cai, K.G. Shadrach, G.D. Prestwich, and J.G. Hollyfield, "Spacrcan Binding to Hyaluronan and Other Glycosaminoglycans," *J. Biol. Chem.*, **279**, 23142-23150 (2004).
411. R. Schneider, B. Brügger, C.M. Amann, G.D. Prestwich, R.F. Epand, G. Zellnig, F.T. Wieland, and R.M. Epand, "Identification and Biophysical Characterization of a Very-long-chain-fatty-acid-substituted Phosphatidylinositol in Yeast Subcellular Membranes," *Biochem. J.*, **381**, 941-949 (2004).
412. G. Sweeney, R.R. Garg, R.B. Ceddia, D. Li, M. Ishiki, R. Somwar, L. Foster, P.O. Neilsen, G.D. Prestwich, A. Rudich, and A. Klip, "Intracellular Delivery of Phosphatidylinositol (3,4,5)-Trisphosphate Causes Incorporation of GLUT4 into the Plasma Membrane of Muscle and Fat Cells without Increasing Glucose Uptake," *J. Biol. Chem.*, **279**, 32233-32242 (2004).
413. J. Lazar, L.E.L. Rasmussen, D.R. Greenwood, I.-S. Bang, and G.D. Prestwich, "Elephant Albumin: A Multi-purpose Pheromone Shuttle," *Chem. & Biol.*, **11**, 1093-1100 (2004).
414. Y. Xu, M. Tanaka, H. Arai, J. Aoki, and G.D. Prestwich, "Alkyl Lysophosphatidic Acid and Fluoromethylene Phosphonate Analogs as Metabolically-Stabilized Agonists for LPA Receptors," *Bioorg. Med. Chem. Lett.*, **14**, 5323-5328 (2004).
415. M.R. Ziebell and G.D. Prestwich, "Interactions of Peptide Mimics of Hyaluronic Acid with the Receptor for Hyaluronan Mediated Motility (RHAMM)," *J. Computer-Aided Molec. Design*, **18**, 597-614 (2004).
416. Y. Liu, H. Li, X.Z. Shu, S.D. Gray, G.D. Prestwich, "Crosslinked Hyaluronan Hydrogels Containing Mitomycin C Reduce Postoperative Abdominal Adhesions," *Fertil. & Steril.*, **83**, 1275-1283 (2005).

417. H. Hama, J. Torabinejad, G.D. Prestwich, and D.B. DeWald, "Measurement and Immunofluorescence of Cellular Phosphoinositides," *Methods Mol. Biol.*, **284**, 243-258 (2004).
418. M. Proctor, K. Proctor, X.Z. Shu, L.D. McGill, G.D. Prestwich, and R.R. Orlandi, "Composition of Hyaluronan Affects Wound Healing in the Rabbit Maxillary Sinus," *Am. J. Rhinol.*, **20**, 206-211 (2006).
419. Y. Xu, J. Aoki, K. Shimizu, M. Umezu-Goto, K. Hama, T. Takanezawa, S. Yu, G.B. Mills, H. Arai, L. Qian, and G.D. Prestwich, "Structure-activity Relationships of Fluorinated Lysophosphatidic Acid Analogues," *J. Med. Chem.*, **48**, 3319-3327 (2005).
420. Y. Liu, X.Z. Shu, and G.D. Prestwich, "Biocompatibility and Stability of Disulfide-Crosslinked Hyaluronan Films," *Biomaterials*, **26**, 4737-4746 (2005).
421. H. Lin, S. Ozaki, N. Fujishiro, K. Takeda, I. Imanaga, G.D. Prestwich, and M. Inoue, "Subunit Composition and Role of Na<sup>+</sup>, K<sup>+</sup>-ATPases in Adrenal Chromaffin Cells," *J. Physiol.*, **564**, 161-172 (2005).
422. S. Cai, Y. Liu, X.Z. Shu, and G.D. Prestwich, "Injectable Glycosaminoglycan Hydrogels for Controlled Release of Human Basic Fibroblast Growth Factor," *Biomaterials*, **26**, 6054-6067 (2005).
423. G.D. Prestwich, Y. Xu, L. Qian, J. Gajewiak, and G. Jiang, "New Metabolically Stabilized Analogues of Lysophosphatidic Acid: Agonists, Antagonists, and Enzyme Inhibitors," *Biochem. Soc. Trans.*, **33**, 1357-1361 (2005).
424. V. Mironov, V. Kasyanov, X.Z. Shu, C. Eisenberg, L. Eisenberg, S. Gonda, T. Trusk, R.R. Markwald, and G.D. Prestwich, "Fabrication of Tubular Tissue Constructs by Centrifugal Casting of Cells Suspended in an In Situ Crosslinkable Hyaluronan-Gelatin Hydrogel," *Biomaterials*, **26**, 7628-7635 (2005).
425. K. Ghosh, X.D. Ren, X.Z. Shu, G.D. Prestwich, and R.A.F. Clark, "Fibronectin Functional Domains Coupled to Hyaluronan Stimulate Adult Human Dermal Fibroblast Responses Critical for Wound Healing," *Tissue Eng.*, **12**, 601-613 (2006).
426. K. Ghosh, X.Z. Shu, R. Mou, J. Lombardi, G.D. Prestwich, M.H. Rafailovich, and R.A.F. Clark, "Rheological Characterization of in Situ Cross-Linkable Hyaluronan Hydrogels," *Biomacromolecules*, **6**, 2857-2865 (2005).
427. S.K. Elkin, D. Ivanov, M. Ewalt, C.G. Ferguson, S.G. Hyberts, Z.-Y. J. Sun, G.D. Prestwich, J. Yuan, G. Wagner, M.A. Oettinger, and O.P. Gozani, "A PHD Finger Motif in the C Terminus of RAG2 Modulates Recombination Activity," *J. Biol. Chem.*, **280**, 28701-28710 (2005).
428. S. Desmaret, L. Qian, B. Vanloo, K. Meerschaert, J. Van Damme, J. Grooten, J. Vandekerckhove, G.D. Prestwich, and J. Gettemans, "Lysophosphatidic Acid Affinity Chromatography Reveals Pyruvate Kinase as a Specific LPA-Binding Protein," *Biol. Chem.*, **386**, 1137-1147 (2005).

429. J.K. Hansen, S.L. Thibeault, J.F. Walsh, X.Z. Shu, and G.D. Prestwich, "In Vivo Engineering of the Vocal Fold Extracellular Matrix with Injectable Hyaluronic Acid Hydrogels: Early Effects on Tissue Repair and Biomechanics in a Rabbit Model," *Ann. Otol. Rhinol. Laryngol.*, **114**, 662-670 (2005).
430. G. Jiang, Y. Xu, T. Falguières, J. Gruenberg, and G.D. Prestwich, "Concise Synthesis of Ether Analogues of Lysobisphosphatidic Acid," *Organic Lett.*, **7**, 3837-3840 (2005).
431. D.B. DeWald, S. Ozaki, S. Malaviya, J.C. Shope, K. Manabe, L. Crosby, P. Neilsen, D. Johnston, S. Harihar, and G.D. Prestwich, "Cellular Calcium Mobilization in Response to Phosphoinositide Delivery," *Cell Calcium*, **38**, 59-72 (2005).
432. G.D. Prestwich, "Visualization and Perturbation of Phosphoinositide and Phospholipid Signaling," *Prostaglandins other Lipid Mediat.*, **77**, 168-178 (2005).
433. C.G. Ferguson, R.D. James, C.S. Bigman, D.A. Shepard, Y. Abdiche, P.S. Katsamba, D.G. Myszka, and G.D. Prestwich, "Phosphoinositide-Containing Polymerized Liposomes: Stable Membrane-Mimetic Vesicles for Protein-Lipid Binding Analysis," *Bioconjugate Chem.*, **16**, 1475-1483 (2005).
434. Y. Xu, X.-h. Liu, and G.D. Prestwich, "Synthesis of Phosphatase-resistant Analogues of Phytic Acid (InsP<sub>6</sub>)," *Tetrahedron Lett.*, **46**, 8311-8314 (2005).
435. D. Jiang, J. Liang, J. Fan, S. Yu, S. Chen, Y. Luo, G.D. Prestwich, M.M. Mascarenhas, H.G. Garg, D.A. Quinn, R.J. Homer, D.R. Goldstein, R. Bucala, P.J. Lee, R. Medzhitov, and P.W. Noble, "Regulation of Lung Injury and Repair by Toll-like Receptors and Hyaluronan," *Nat. Med.*, **11**, 1173-1179 (2005).
436. R.A. Peattie, E. Rieke, E. Hewett, R.J. Fisher, X.Z. Shu, and G.D. Prestwich, "Dual Growth Factor-Induced Angiogenesis In Vivo Using Hyaluronan Hydrogel Implants," *Biomaterials*, **27**, 1868-1875 (2006).
437. C. Sondrup, Y. Liu, X.Z. Shu, G.D. Prestwich, and M.E. Smith, "Cross-linked Hyaluronan-coated Stents in the Prevention of Airway Stenosis," *Otolaryngol.-Head & Neck Surg.*, **135**, 28-35 (2006).
438. R. Brunecky, S. Lee, P.W. Rzepecki, M. Overduin, G.D. Prestwich, A.G. Kutateladze, and T.G. Kutateladze, "Investigation of the Binding Geometry of a Peripheral Membrane Protein," *Biochemistry*, **44**, 16064-16071 (2005).
439. S. Duflo, S.L. Thibeault, W. Li, X.Z. Shu, and G.D. Prestwich, "Vocal Fold Tissue Repair *in Vivo* Using a Synthetic Extracellular Matrix," *Tissue Eng.*, **12**, 2171-2180 (2006).
440. V. Mironov, V.A. Kasyanov, M.J. Yost, R. Visconti, W. Twal, T. Trusk, X. Wen, I. Ozolanta, A. Kadish, G.D. Prestwich, L. Terracio, and R.R. Markwald, "Cardiovascular Tissue Engineering I. Perfusion Bioreactors: A Review," *J. Long-Term Eff. Med. Implants*, **16**, 111-130 (2006).
441. Y. Liu, S. Ahmad, X.Z. Shu, R.K. Sanders, S.A. Kopesec, and G.D. Prestwich, "Accelerated Repair of Cortical Bone Defects Using a Synthetic Extracellular Matrix to Deliver Human Demineralized Bone Matrix," *J. Orthoped. Res.*, **24**, 1454-1462 (2006).

442. G. Jiang, Y. Xu, and G.D. Prestwich, "Practical Enantiospecific Syntheses of Lysobisphosphatidic Acid and Its Analogues," *J. Org. Chem.*, **71**, 934-939 (2006).
443. Y. Xu, S.A. Lee, T.G. Kutateladze, D. Sbrissa, A. Shisheva, and G.D. Prestwich, "Chemical Synthesis and Molecular Recognition of Phosphatase-Resistant Analogues of Phosphatidylinositol-3-phosphate," *J. Am. Chem. Soc.*, **128**, 885-897 (2006).
444. L. Qian, Y. Xu, T. Simper, G. Jiang, J. Aoki, M. Umezo-Goto, H. Arai, S. Yu, G.B. Mills, R. Tsukahara, N. Makarova, Y. Fujiwara, G. Tigyi, and G.D. Prestwich, "Phosphorothioate Analogues of Alkyl Lysophosphatidic Acid as LPA<sub>3</sub> Receptor-Selective Agonists," *Chem. Med. Chem.*, **1**, 376-383 (2006).
445. J. Ren, Y.-j. Xiao, L.S. Singh, X. Zhao, Z. Zhao, L. Feng, T.M. Rose, G.D. Prestwich, and Y. Xu, "Lysophosphatidic Acid is Constitutively Produced by Human Peritoneal Mesothelial Cells and Enhances Adhesion, Migration, and Invasion of Ovarian Cancer Cells," *Cancer Res.*, **66**, 3006-3014 (2006).
446. A.L. Brown, M.J. Ringuette, G.D. Prestwich, D.J. Bagli, and K.A. Woodhouse, "Effects of Hyaluronan and SPARC on Fibroproliferative Events Assessed in an In Vitro Bladder Acellular Matrix Model," *Biomaterials*, **27**, 3825-3835 (2006).
447. X.Z. Shu, S. Ahmad, Y. Liu, and G.D. Prestwich, "Synthesis and Evaluation of Injectable, *in situ* Crosslinkable Synthetic Extracellular Matrices for Tissue Engineering," *J. Biomed. Mater. Res.* **79A**, 902-912 (2006).
448. T.M. Rose and G.D. Prestwich, "Fluorogenic Phospholipids as Head Group-Selective Reporters of Phospholipase A Activity," *ACS Chemical Biology*, **1**, 63-92 (2006).
449. H. Zhang, K. Shibuya, H. Hemmi, T. Nishino, and G.D. Prestwich, "Total Synthesis of Geranylgeranylglyceryl Phosphate Enantiomers: Substrates for Characterization of 2,3-*O*-Digeranylgeranylglyceryl Phosphate Synthase," *Organic Lett.*, **8**, 943-946 (2006).
450. A.H. Park, C.W. Hughes, A. Jackson, L. Hunter, L. McGill, S.E. Simonsen, S.C. Alder, X.Z. Shu, and G.D. Prestwich, "Crosslinked Hydrogels for Tympanic Membrane Repair," *Otolaryngol.-Head Neck Surg.*, **135**, 877-883 (2006).
451. A.H. Park, A. Jackson, L. Hunter, L. McGill, S.E. Simonsen, S.C. Alder, X.Z. Shu, and G.D. Prestwich, "Cross-Linked Hydrogels for Middle Ear Packing," *Otol. Neurotol.*, **27**, 1170-1175 (2006).
452. G.D. Prestwich, Y. Liu, B. Yu, X.Z. Shu, and A. Scott, "3-D Culture in Synthetic Extracellular Matrices: New Tissue Models for Drug Toxicology and Cancer Drug Discovery," *Adv. Enz. Reg.*, **47**, 196-207 (2007).
453. Y. Ji, K. Ghosh, X.Z. Shu, B. Li, J.C. Sokolov, G.D. Prestwich, R.A.F. Clark, and M.H. Rafailovich, "Electrospun Three-Dimensional Hyaluronic Acid Nanofibrous Scaffolds," *Biomaterials*, **27**, 3782-3792 (2006).
454. T.D. Mehra, K. Ghosh, X.Z. Shu, G.D. Prestwich, and R.A.F. Clark, "Molecular Stenting with a Crosslinked Hyaluronan Derivative Inhibits Collagen Gel Contraction," *J. Invest. Dermatol.*, **126**, 2202-2209 (2006).

455. S. Duflo, S.L. Thibeault, W. Li, X.Z. Shu, and G.D. Prestwich, "Effect of a Synthetic Extracellular Matrix on Vocal Fold Lamina Propria Gene Expression in Early Wound Healing," *Tissue Eng.*, **12**, 3201-3207 (2006).
456. A.L. Brown, E.M. Srokowski, X.Z. Shu, G.D. Prestwich, and K.A. Woodhouse, "Development of a Model Bladder Extracellular Matrix Combining Disulfide Cross-linked Hyaluronan with Decellularized Bladder Tissue," *Macromol. Biosci.*, **6**, 648-657 (2006).
457. J. Gajewiak, S. Cai, X.Z. Shu, and G.D. Prestwich, "Aminoxy Pluronic: Synthesis and Preparation of Glycosaminoglycan Adducts," *Biomacromolecules*, **7**, 1781-1789 (2006).
458. H. Zhang, Y. Xu, Z. Zhang, E.R. Liman, and G.D. Prestwich, "Synthesis and Biological Activity of Phospholipase C-Resistant Analogues of Phosphatidylinositol 4,5-bisphosphate," *J. Am. Chem. Soc.*, **128**, 5642-5643 (2006).
459. Y. Liu, X.Z. Shu, and G.D. Prestwich, "Reduced Postoperative Intra-abdominal Adhesions Using Carbylan-SX, a Semisynthetic Glycosaminoglycan Hydrogel," *Fertil. & Steril.*, **87**, 940-948 (2007).
460. C.G. Ferguson, C.S. Bigman, R.D. Richardson, L.A. van Meeteren, W.H. Moolenaar, and G.D. Prestwich, "Fluorogenic Phospholipid Substrate to Detect Lysophospholipase D/Autotaxin Activity," *Organic Lett.*, **8**, 2023-2026 (2006).
461. D.B. Pike, S. Cai, K.R. Pomraning, M.A. Firpo, R.J. Fisher, X.Z. Shu, G.D. Prestwich, and R.A. Peattie, "Heparin-regulated Release of Growth Factors *In Vitro* and Angiogenic Response *In Vivo* to Implanted Hyaluronan Hydrogels Containing VEGF and bFGF," *Biomaterials*, **27**, 5242-5251 (2006).
462. T.M. Rose and G.D. Prestwich, "Synthesis and Evaluation of Fluorogenic Substrates for Phospholipase D and Phospholipase C," *Organic Lett.*, **8**, 2575-2578 (2006).
463. J. Gajewiak, Y. Xu, S.A. Lee, T.G. Kutateladze, and G.D. Prestwich, "Synthesis and Molecular Recognition of Phosphatidylinositol-3-methylenephosphate," *Organic Lett.*, **8**, 2811-2813 (2006).
464. H. Zhang, R. Tsukahara, G. Tigyi, and G.D. Prestwich, "Synthesis of Cyclic Phosphate Analogues of (Lyso)phosphatidic Acid Using a Ring-Closing Metathesis Reaction," *J. Org. Chem.*, **71**, 6061-6066 (2006).
465. Y. Liu, X.Z. Shu, and G.D. Prestwich, "Osteochondral Defect Repair with Autologous Bone Marrow-Derived Mesenchymal Stem Cells in an Injectable, *in situ* Crosslinked Synthetic Extracellular Matrix," *Tissue Eng.*, **12**, 3405-3416 (2006).
466. Y. Xu, G. Jiang, R. Tsukahara, Y. Fujiwara, G. Tigyi, and G.D. Prestwich, "Phosphonothioate and Fluoromethylene Phosphonate Analogues of Cyclic Phosphatidic Acid: Novel Antagonists of Lysophosphatidic Acid Receptors," *J. Med. Chem.*, **49**, 5309-5315 (2006).
467. G.D. Prestwich and J.-w. Kuo, "Chemically-Modified HA for Therapy and Regenerative Medicine," invited article, *Curr. Pharm. Biotech.*, **9**, 242-245 (2008).



468. C.M. Riley, P.W. Fuegy, M.A. Firpo, X.Z. Shu, G.D. Prestwich, and R.A. Peattie, "Stimulation of *In Vivo* Angiogenesis Using Dual Growth Factor-loaded Crosslinked Glycosaminoglycan Hydrogels," *Biomaterials*, **27**, 5935-5943 (2006).
469. X. Zhao, D. Wang, Z. Zhao, Y. Xiao, S. Sengupta, Y. Xiao, R. Zhang, K. Lauber, S. Wesselborg, L. Feng, T.M. Rose, Y. Shen, J. Zhang, G. Prestwich, and Y. Xu, "Caspase-3-dependent Activation of Calcium-independent Phospholipase A<sub>2</sub> Enhances Cell Migration in Non-apoptotic Ovarian Cancer Cells," *J. Biol. Chem.*, **281**, 29357-29368 (2006).
470. J. Gajewiak and G.D. Prestwich, "Phosphomimetic Sulfonamide and Sulfonamidoxo Analogues of (Lyso)Phosphatidic Acid," *Tetrahedron Lett.*, **47**, 7607-7609 (2006).
471. H. Zhang, N. Markadieu, R. Beauwens, C. Erneux, and G.D. Prestwich, "Synthesis and Biological Activity of PTEN-Resistant Analogues of Phosphatidylinositol 3,4,5-trisphosphate," *J. Am. Chem. Soc.*, **128**, 16464-16465 (2006).
472. G.D. Prestwich, X.Z. Shu, Y. Liu, S. Cai, J.F. Walsh, C.W. Hughes, S. Ahmad, K.R. Kirker, B. Yu, R.R. Orlandi, A.H. Park, S.L. Thibeault, and M.E. Smith, "Injectable Synthetic Extracellular Matrices for Tissue Engineering and Repair," *Adv. Exp. Med. Biol.*, **585**, 125-133 (2006).
473. Y. Liu, X.Z. Shu, and G.D. Prestwich, "Tumor Engineering: Orthotopic Cancer Models in Mice Using Cell-Loaded, Injectable, Cross-linked Hyaluronan-Derived Hydrogels," *Tissue Eng.*, **13**, 1091-1101 (2007).
474. Y. Liu, S. Cai, X.Z. Shu, J. Shelby, and G.D. Prestwich, "Release of Basic Fibroblast Growth Factor from a Crosslinked Glycosaminoglycan Hydrogel Promotes Wound Healing," *Wound Rep. Reg.*, **15**, 245-251 (2007).
475. Y. Endo, K. Harada, N. Fujishiro, H. Funahashi, S. Shioda, G.D. Prestwich, K. Mikoshiba, and M. Inoue, "Organelles Containing Inositol Trisphosphate Receptor Type 2 in Adrenal Medullary Cells," *J. Physiol. Sci.*, **56**, 415-423 (2006).
476. E.M. Horn, M. Beaumont, X.Z. Shu, A. Harvey, G.D. Prestwich, K.M. Horn, A.R. Gibson, M.C. Preul, and A. Panitch, "Influence of Cross-Linked Hyaluronic Acid Hydrogels on Neurite Outgrowth and Recovery from Spinal Cord Injury," *J. Neurosurg. Spine*, **6**, 133-140 (2007).
477. G. Jiang, Y. Xu, Y. Fujiwara, T. Tsukahara, R. Tsukahara, J. Gajewiak, G. Tigyi, and G.D. Prestwich, "α-Substituted Phosphonate Analogues of Lysophosphatidic Acid (LPA) Selectively Inhibit Production and Action of LPA," *Chem. Med. Chem.*, **2**, 679-690 (2007).
478. R.C. Connors, J.J. Muir, Y. Liu, G.R. Reiss, P.C. Kouretas, M.G Whitten, T.K. Sorenson, G.D. Prestwich, and D.A. Bull, "Postoperative Pericardial Adhesion Prevention Using Carbylan-SX in a Rabbit Model," *J. Surg. Res.*, **140**, 237-242 (2007).
479. V. Mironov, G.D. Prestwich, and G. Forgacs, "Bioprinting Living Structures," *J. Mater. Chem.*, **17**, 2054-2060 (2007).
480. R.R. Orlandi, X.Z. Shu, L. McGill, E. Petersen, and G.D. Prestwich, "Structural Variations in a Single Hyaluronan Derivative Significantly Alter Wound-Healing Effects in the Rabbit Maxillary Sinus," *Laryngoscope*, **117**, 1288-1295 (2007).

481. W. Huang, H. Zhang, F. Davrazou, T.G. Kutateladze, X. Shi, O. Gozani, and G.D. Prestwich, "Stabilized Phosphatidylinositol-5-Phosphate Analogues as Ligands for the Nuclear Protein ING2: Chemistry, Biology, and Molecular Modelling," *J. Am. Chem. Soc.*, **129**, 6498-6506 (2007).
482. G.D. Prestwich, "Simplifying the Extracellular Matrix for 3-D Cell Culture and Tissue Engineering: A Pragmatic Approach," *J. Cell. Biochem.*, **101**, 1370-1383 (2007).
483. L. Zhang, W. Huang, A. Tanimura, T. Morita, S. Harihar, D.B. DeWald, and G.D. Prestwich, "Synthesis and Biological Activity of Metabolically Stabilized Cyclopentyl Trisphosphate Analogues of D-*myo*-Ins(1,4,5)P<sub>3</sub>," *Chem. Med. Chem.*, **2**, 1281-1289 (2007).
484. Y. Liu, A. Skardal, X.Z. Shu, and G.D. Prestwich, "Prevention of Peritendinous Adhesions Following Flexor Tendon Injury with Carbylan™-SX, a Semisynthetic Glycosaminoglycan Hydrogel," *J. Orthopedic Res.*, **26**, 562-569 (2008).
485. C. Pasquali, D. Bertschy-Meier, C. Chabert, M.-L. Curchod, C. Arod, R.A. Booth, K. Mechtler, F. Vilbois, I. Xenarios, C.G. Ferguson, G.D. Prestwich, M. Camps, and C. Rommel, "A Chemical Proteomics Approach to Phosphatidylinositol 3-Kinase Signaling in Macrophages," *Molec. Cellular Proteomics*, **6**, 1829-1841 (2007).
486. G.D. Prestwich, "Evaluating Drug Toxicity and Efficacy in Three Dimensions: Using Synthetic Extracellular Matrices in Drug Discovery," *Acc. Chem. Res.*, **41**, 139-148 (2008).
487. M.A. Serban and G.D. Prestwich, "Synthesis of Hyaluronan Haloacetates and Biology of Novel Cross-Linker-Free Synthetic Extracellular Matrix Hydrogels," *Biomacromolecules*, **8**, 2821-2828 (2007).
488. J. Gajewiak, R. Tsukahara, T. Tsukahara, Y. Fujiwara, S. Yu, Y. Lu, M. Murph, G.B. Mills, G. Tigyi, and G.D. Prestwich, "Alkoxymethylenephosphonate Analogues of (Lyso)Phosphatidic Acid Stimulate Signaling Networks Coupled To The LPA<sub>2</sub> Receptor," *Chem. Med. Chem.*, **2** 1789-1798 (2007).
489. L. Flynn, G.D. Prestwich, J.L. Semple, and K.A. Woodhouse, "Adipose Tissue Engineering with Naturally-derived Scaffolds and Adipose-derived Stem Cells," *Biomaterials*, **28**, 3834-3842 (2007).
490. J.L. Vanderhooft, B.K. Mann, and G.D. Prestwich, "Synthesis and Characterization of Novel Thiol-Reactive Poly(ethylene glycol) Cross-linkers for Extracellular Matrix Mimetic Biomaterials," *Biomacromolecules*, **8**, 2883-2889 (2007).
491. E.A. Crowder, M.S. Saha, R.W. Pace, H. Zhang, G.D. Prestwich, and C.A. Del Negro, "Phosphatidylinositol 4,5-Bisphosphate Regulates Inspiratory Burst Activity in the Neonatal Mouse preBötzing Complex," *J. Physiol.*, **582**, 1047-1058 (2007).
492. G.D. Prestwich, "Organ Printing," *Chem. Biol.*, **2**, B33-B40 (2007).
493. C. Costa, L. Barberis, C. Ambrogio, A.D. Manazza, E. Patrucco, O. Azzolino, P.O. Nielsen, E. Ciruolo, F. Altruda, G.D. Prestwich, R. Chiarle, M. Wymann, A. Ridley, and E. Hirsch, "Negative Feedback Regulation of Rac in Leukocytes from Mice Expressing a Constitutively Active Phosphatidylinositol 3-Kinase  $\gamma$ ," *Proc. Natl. Acad. Sci. USA*, **104**, 14354-14359 (2007).

494. R. Bhandari, A. Saiardi, Y. Ahmadibeni, A.M. Snowman, A.C. Resnick, T.Z. Kristiansen, H. Molina, A. Pandey, J.K. Werner Jr., K.R. Juluri, Y. Xu, G.D. Prestwich, K. Parang, and S.H. Snyder, "Protein Pyrophosphorylation by Inositol Pyrophosphates is a Posttranslational Event," *Proc. Natl. Acad. Sci. USA*, **104**, 15305-15310 (2007).
495. C. Zhao, M.J. Fernandez, G.D. Prestwich, M. Turgeon, J. Di Battista, T. Clair, P.E. Poubelle, and S.G. Bourgoin, "Regulation of Lysophosphatidic Acid Receptor Expression and Function in Human Synoviocytes: Implications for Rheumatoid Arthritis?," *Molec. Pharm.*, **73**, 587-600 (2008).
496. M.A. Serban, Y. Liu, and G.D. Prestwich, "Effects of Synthetic Extracellular Matrices on Primary Human Fibroblast Behavior," *Acta Biomaterialia*, **4**, 67-75 (2008).
497. C.L. Scaife, J.E. Shea, Q. Dai, M.A. Firpo, G.D. Prestwich, and S.J. Mulvihill, "Synthetic Extracellular Matrix Enhances Tumor Growth and Metastasis in an Orthotopic Mouse Model of Pancreatic Adenocarcinoma," *J. Gastrointest. Surg.*, **12**, 1074-1080 (2008).
498. H. Zhang, Y. Xu, N. Markadiou, R. Beauwens, C. Erneux, G. D. Prestwich, "Synthesis and Biological Activity of Phosphatidylinositol 3, 4, 5-Trisphosphorothioate," *Bioorg. Med. Chem. Lett.*, **18** 762-766 (2008).
499. V. Mironov, V. Kasyanov, R. R. Markwald and G.D. Prestwich, "Bioreactor-free tissue engineering: directed tissue assembly by centrifugal casting," *Exp. Opin. Biol. Ther.*, **8**, 143-152 (2008).
500. M.A. Serban, G. Yang, and G.D. Prestwich, "Synthesis, Characterization and Chondroprotective Properties of a Novel Hyaluronan Thioethyl Ether Derivative," *Biomaterials*, **29**, 1388-1399 (2008).
501. M.A. Serban, G. D. Prestwich, "Making Modular Extracellular Matrices: Solutions for the Puzzle," *Methods*, **45**, 93-98 (2008).
502. W.S. Turner, C. Seagle, J. Galanko, O. Favorov, G.D. Prestwich, J.M. Macdonald, and L.M. Reid, "Nuclear Magnetic Resonance Metabolomic Footprinting of Human Hepatic Stem Cells and Hepatoblasts Cultured in Hyaluronan Hydrogels," *Stem Cells*, **26**, 1547-1555 (2008).
503. L. Flynn, G. D. Prestwich, J. L. Semple, K. A. Woodhouse, "Proliferation and Differentiation of Adipose-derived Stem Cells on Naturally-Derived Scaffolds," *Biomaterials*, **29**, 1862-1871 (2008).
504. S.M. Butterfield, D. Tran, H. Zhang, G. D. Prestwich, S. Matile, "Fluorometric Detection of Inositol Phosphates and the Activity of their Enzymes with Synthetic Pores: Discrimination of IP<sub>7</sub> and IP<sub>6</sub> and Phytate Sensing in Complex Matrices," *J. Am. Chem. Soc.*, **130**, 3270-3271 (2008).
505. L. Hosack, M. A. Firpo, J. A. Scott, G. D. Prestwich, R. A. Peattie, "Microvascular Maturity Elicited in Tissue Treated with Cytokine-loaded Hyaluronan-based Hydrogels," *Biomaterials*, **29**, 2336-2347 (2008).
506. J. Gajewiak, R. Tsukahara, Y. Fujiwara, G. Tigyi, G. D. Prestwich, "Synthesis, Pharmacology and Cell Biology of *sn*-2-Aminoxy Analogues of Lysophosphatidic Acid," *Org. Lett.*, **10**, 1111-1114 (2008).

507. M. A. Serban, J. A. Scott, G. D. Prestwich, "Use of Hyaluronan-Derived Hydrogels for 3-D Cell Culture and Tumor Xenografts," *Curr. Protocols Cell Biol.*, **40**, 10.14.1-10.14.21 (2008).
508. G. D. Prestwich, J. Gajewiak, H. Zhang, G. Yang, M. A. Serban, "Phosphatase-Resistant Analogues of Lysophosphatidic Acid: Agonists Promote Healing, Antagonists and Autotaxin Inhibitors Treat Cancer," *Biochim. Biophys. Acta*, **1781**, 588-594 (2008).
509. L. Flynn, G. D. Prestwich, J. L. Semple, K. A. Woodhouse, "Adipose Tissue Engineering *In Vivo* with Adipose-Derived Stem Cells on Naturally Derived Scaffolds," *J. Biomed. Mater. Res.*, **29**, 1862-1871 (2008).
510. R. A. Peattie, B. Yu, S. Cai, D. B. Pike, M. A. Firpo, R. J. Fisher, X. Z. Shu, G. D. Prestwich, "Effect of Gelatin on Heparin Regulation of Cytokine Release from Hyaluronan-based Hydrogels," *Drug Delivery*, **15**, 363-371 (2008).
511. G. D. Prestwich, "Engineering a Clinically-Useful Matrix for Cell Therapy," *Organogenesis*, **4**, 42-47 (2008).
512. A.K. Ekapurta, G.D. Prestwich, S. Cool, and D.W. Hutmacher, "Combining Electrospun Scaffolds with Electrosprayed Hydrogels leads to Three Dimensional Cellularization of Hybrid Constructs," *Biomacromolecules*, **9**, 2097-2103 (2008).
513. A.L. Khandoga, Y. Fujiwara, P. Goyal, D. Pandey, R. Tsukahara, A. Bolen, H. Guo, N. Wilke, J. Liu, W. J. Valentine, G. G. Durgam, D. D. Miller, G. Jiang, G. D. Prestwich, G. Tigyi, W. Seiss, "Lysophosphatidic Acid-induced Platelet Shape Change Revealed through LPA (1-5) Receptor-selective Probes and Albumin," *Platelets*, **19**, 415-427 (2008).
514. J. Zhang, A. Skardal, G. D. Prestwich, "Engineered Extracellular Matrices with Cleavable Crosslinkers for Cell Expansion and Easy Cell Recovery," *Biomaterials*, **29**, 4521-4531 (2008).
515. J. L. Vanderhooft, M. Acoutlabi, J. J. Magda, G. D. Prestwich, "Rheological Properties of Cross-linked Hyaluronan-Gelatin Hydrogels for Tissue Engineering," *Macromol. Biosci.*, **9**, 20-28 (2009).
516. J. Zhao, N. Zhang, J. A. Scott, G. D. Prestwich, and X. Wen, "Recruitment of Endogenous Stem Cells for Tissue Repair," *Macromol. Biosci.*, **8**, 836-842 (2008).
517. V. A. Kasyanov, J. Hodde, M. C. Hiles, C. Eisenberg, L. Eisenberg, L. E. F. De Castro, I. Ozolanta, M. Murovska, R. A. Fraughn, G. D. Prestwich, R. R. Markwald, V. Mironov, "Rapid Biofabrication of Tubular Tissue Construct by Centrifugal Casting in a Decellularized Natural Scaffold with Laser-Machined Micropores," *J. Mater. Sci: Mater Med.*, **20**, 329-337 (2008).
518. G. Sarikonda, H. Wang, K. Puan, X-h. Liu, H. K. Lee, Y. Song, M. Distefano, E. Oldfield, G. D. Prestwich, C. T. Morita, "Photoaffinity Antigens for Human  $\gamma\delta$  T Cells" *J. Immunol.*, **181**, 7739-7750 (2008).
519. S. L. Thibeault, S. A. Klemuk, M. E. Smith, C. Leugers, G. D. Prestwich, "In Vivo Comparison of Biomimetic Approaches for Tissue Regeneration of the Scarred Vocal Fold," *Tissue Eng., Part A*, **15**, 1481-1487 (2009).

520. J. Chevallier, Z. Chamoun, G. Jiang, G. D. Prestwich, N. Sakai, S. Matile, R. G. Parton, J. Gruenberg, "Lysobisphosphatidic Acid Controls Endosomal Cholesterol Levels." *J. Biol. Chem.*, **283**, 27871-27880 (2008).
521. H. Zhang, J. Thompson, G. D. Prestwich, "A Scalable Synthesis of the IP<sub>7</sub> Isomer, 5-PP-Ins(1,2,3,4,6) P<sub>5</sub>," *Org. Lett.*, **11**, 1551-1554 (2009).
522. B. Morrison, E. Lamarre, J. A. Bauer, R. Haney, J. Drazba, G. D. Prestwich, D. J. Linner, "Gene Deletion of Inositol Hexakisphosphate Kinase 2 Predisposes to Aerodigestive Tract Carcinoma," *Oncogene*, **28**, 2383-2392 (2009).
523. X. Xu, G. Yang, H. Zhang, G. D. Prestwich, "Evaluating Dual Activity LPA Receptor Pan-Antagonist/Autotaxin Inhibitors as Anti-Cancer Agents *in vivo* Using Engineered Human Tumors," *Prostaglandins other Lipid Mediat.*, **89**, 140-146 (2009).
524. H. Zhang, X. Xu, J. Gajewiak, R. Tsukarara, J. Liu, J. Fells, D. Perygin, A. Parrill, G. Tigyi, G. D. Prestwich, "Dual Activity Lysophosphatidic Acid Receptor Pan Antagonist -Lysophospholipase D Inhibitor Suppresses Breast Cancer Cell Migration and Invasion *in vitro* and causes Tumor Regression *in vivo*," *Cancer Res.*, **69**, 5441-5449 (2009).
525. G. D. Prestwich, "Clinical Biomaterials for Scar-Free Healing and Localized Delivery of Cells and Growth Factors," *Adv. Wound Care*, **1**, 394-399 (2010).
526. H. Zhang, J. He, T.G. Kutateladze, T. Sakai, T. Sasaki, N. Markadieu, C. Erneux, G. D. Prestwich, "5-Stabilized Phosphatidylinositol 3,4,5-Trisphosphate Analogues Bind Grp1 PH and Inhibit Neutrophil Migration," *ChemBioChem*, **11**, 388-395 (2010).
527. X. Xu and G. D. Prestwich, "Inhibition of Tumor Growth and Angiogenesis by a Lysophosphatidic Acid Antagonist in an Engineered Three-Dimensional Lung Cancer Xenograft Model," *Cancer* **116**, 1739-1750 (2010).
528. G. Yang, L. Espandar, N. Mamalis, G. D. Prestwich, "A Crosslinked Hyaluronan Derivative Accelerates Healing of Corneal Epithelial Abrasion and Alkali Burn Injuries in Rabbits," *Vet. Ophthalmology*, **13**, 144-150 (2010).
529. V. Gopal, W. Jia, S. Yu, H. Hall, G. B. Mills, C. McGinnis, M. G. Bartlett, G. Jiang, D. Madan, G. D. Prestwich, Y. Xu, M. A. Davies, M. M. Murph, "Targeting melanoma growth and viability reveals dualistic functionality of the phosphonothioate analogue of carba cyclic phosphatidic acid," *Molecular Cancer*, **9**, 140-149 (2010).
530. R. Elia, P. W. Fuegy, A. VanDelden, M. A. Firpo, G. D. Prestwich, and R. A. Peattie, "Stimulation of *in vivo* angiogenesis by *in situ* crosslinked, dual growth factor-loaded, glycosaminoglycan hydrogels," *Biomaterials*, **31**, 4630-4638 (2010).
531. A. Skardal, J. Zhang, L. McCoard, X. Xu, S. Oottamasathien, G. D. Prestwich, "Photocrosslinkable hyaluronan-gelatin hydrogels for two-step bioprinting," *Tissue Engineering Part A*, **16**, 2675-2685 (2010).
532. A. Skardal, J. Zhang, and G. D. Prestwich, "Bioprinting Vessel-Like Constructs Using Hyaluronan Hydrogels Crosslinked with Tetrahedral Polyethylene Glycol Tetracrylates," *Biomaterials*, **31**, 6173-6181 (2010)

533. N. V. Rao, B. Argyle, X. Xu, P. R. Reynolds, J. M. Walenga, M. Prechel, G. D. Prestwich, R. B. MacArthur, B. B. Walters, J. R. Hoidal, and T. P. Kennedy, "Low Anticoagulant Heparin Targets Multiple Sites of Inflammation, Suppresses Heparin-Induced Thrombocytopenia and Inhibits Interaction of RAGE with its Ligands," *Am. J. Physiol. Cell Physiol.*, **299**, C97-C110 (2010)
534. M. D. Best, H. Zhang, and G. D. Prestwich, "Inositol Polyphosphates, Diphosphoinositol Polyphosphates and Phosphatidylinositol Polyphosphate Lipids: Structure, Synthesis, and Development of Probes for Studying Biological Activity," *Natural Products Reviews*, **27**, 1403-1430 (2010).
535. A. Skardal, J. Zhang, L. McCoard, S. Oottamasathien, G. D. Prestwich, "Dynamically Crosslinked Gold Nanoparticle – Hyaluronan Hydrogels," *Advanced Materials*, **22**, 4736-4740 (2010)
536. A. Skardal, S. Sarker, A. Crabbé, C. A. Nickerson, G. D. Prestwich, "The Generation of 3D Tissue Models based on Hyaluronan Hydrogel-Coated Microcarriers within a Rotating Wall Vessel Bioreactor," *Biomaterials*, **31**, 8426-8435 (2010)
537. E. V. Berdyshev, J. Goya, I. Goshkova, G. D. Prestwich, H-S. Byun, R. Bittman, and V. Natarajan, "Characterization of S1P lyase activity by electrospray ionization-liquid chromatography/tandem mass spectrometry quantitation of (2E)-hexadecanal," *Analyt. Biochem.* **408**, 12-18 (2011)
538. J. Burdick, G. D. Prestwich, "Hyaluronic Acid Hydrogels for Biomedical Applications", *Advanced Materials* **23**, H41-H56 (2011)
539. J. Zhang, X. Xu, N. V. Rao, B. Argyle, L. McCoard, W. J. Rusho, T. P. Kennedy, G. D. Prestwich, and G. Krueger, "Novel Sulfated Polysaccharides Disrupt RAGE Ligation and Inhibit Cutaneous Inflammation in a Mouse Model of Rosacea", *PLoS One*, **6** (2), e16658 (2011)
540. S. Oottamasathien W. Jia, L. McCoard, S. Slack, J. Zhang, A. Skardal, A., T. P. Kennedy, R. Dull, G. D. Prestwich, "A Murine Model for Inflammatory Bladder Disease: Cathelicidin Peptide-Induced Bladder Inflammation and Treatment with Sulfated Polysaccharides," *J. Urol.*, **186**, 1684-1692 (2011).
541. G. D. Prestwich, "Clinical Biomaterials Derived from Hyaluronic Acid for Use in Cell and Molecule Delivery in Regenerative Medicine," *J. Controlled Release*, **155**, 193-199 (2011).
542. G. Jiang, D. Madan, G. D. Prestwich, "Aromatic Phosphonate Inhibitors of the Lysophospholipase D Activity of Autotaxin," *Bioorg. Med. Chem. Lett.*, **21**, 5098-5101 (2011).
543. M. Record, S. Amara, C. Subra, G. Jiang, G. D. Prestwich, F. Ferrato, I. Douchet, and F. Carriere, "Bis(monoacylglycero)phosphate interfacial properties and lipolysis by the pancreatic lipase-related protein 2 (PLRP2), an enzyme present in THP-1 human monocytes," *Biochim. Biophys. Acta Mol. Cell Biol. Lipids*, **1811**, 419-430 (2011).
544. J. He, J. Gajewiak, J. Scott, D. Gong, M. Best, G. D. Prestwich, R. Stahelin, T. Kutateladze, "Metabolically stabilized derivatives of phosphatidylinositol 4-phosphate: synthesis and applications," *Chem. Biol.*, **18**, 1312-1319 (2011).
545. O. A. Lozoya, E. Wauthier, R. Turner, C. Barbier, G. D. Prestwich, F. Guilak, R. Superfine, S. R.

- Lubkin, L. M. Reid, "Mechanical stiffness of the microenvironment regulates hepatic stem/progenitors in experimental models of the stem cell niche of the human liver", *Biomaterials*, **32**, 7389-7402 (2011).
546. A. Inoue, N. Arima, J. Ishiguro, G. D. Prestwich, H. Arai, and J. Aoki, "LPA-producing enzyme PA-PLA1 $\alpha$  regulates hair follicle development by modulating EGFR signaling", *EMBO J.*, **30**, 4248 - 4260 (2011)
547. A. K. Ekaputra, G. D. Prestwich, S. Cool, and D. W. Hutmacher, "Three-dimensional vascularization of growth factor-releasing hybrid scaffold of poly( $\epsilon$ -caprolactone)/collagen fibers and hyaluronic acid hydrogel", *Biomaterials*, **32**, 8108-8117 (2011)
548. A. Chopra, V. Lin, A. McCollough, S. Atzet, G. D. Prestwich, A. S. Wechsler, M. E. Murray, S. A. Oake, J. Y. Kresh, P. A. Janmey, "Reprogramming Cardiomyocyte Mechanosensing by Crosstalk Between Integrins and Hyaluronic Acid Receptors," *J. Biomechanics* **45**, 824-831 (2012).
549. R. Elia, D. R. Newhide, P. D. Pedevillano, G. R. Reiss, M. A. Firpo, E. W. Hsu, D. L. Kaplan, G. D. Prestwich, and R. A. Peattie, "Silk-Hyaluronate-Based Composite Hydrogels: a Novel, Securable Vehicle for Drug Delivery," *J. Biomater. Applic.* **27**, 749-762 (2011).
550. R. Bartlett, G. D. Prestwich, and S. L. Thibeault, Therapeutic potential of gel-based injectables for vocal fold regeneration, *Biomedical Materials*, **7**, 024103 IOP Publishing (2012).
551. G. Yang, B. Mann, G. D. Prestwich, "Thiolated carboxymethyl hyaluronic acid-based biomaterials enhance wound healing in rats, dogs, and horses," *ISRN Veterinary Science*, **2011**, ID 851593, 7 pp (2011).
552. A. Astashkina, B. K. Mann, G. D. Prestwich, and D. W. Grainger, "A 3-D organoid kidney culture model engineered for high throughput nephrotoxicity assays," *Biomaterials*, **33**, 4700-4711 (2012).
553. A. Astashkina, B. K. Mann, G. D. Prestwich, and D. W. Grainger, "Comparing predictive drug nephrotoxicity in kidney 3-D primary organoid culture and immortalized cell lines," *Biomaterials*, **33**, 4712-4721(2012).
554. G. D. Prestwich, "From Classroom to Courtroom: Can Academics be Effective Expert Witnesses," *Materials Today*, **15**, 406-409 (2012).
555. K. Cheng, A. Blusztajn, D. Shen, T-S. Li, B. Sun, G. Galang, T. Zarembinski, G. D. Prestwich, E. Marban, R. Ruckdeschel Smith, and L. Marban, "Enhanced Engraftment and Therapeutic Benefit of Human Cardiosphere-derived Cells Delivered in an *In Situ* Polymerizable Hydrogel", *Biomaterials* **33**, 5317-5324 (2012).
556. R. Turner, E. Wauthier, O. Lozoya, R. McClelland, J. E. Bowsher, C. Barbier, D. Gerber, G. D. Prestwich, E. Hsu, D. A Gerber and L. M. Reid, Successful Transplantation of Human Hepatic Stem Cells and with Restricted Localization to Liver Using Hyaluronan Grafts, *Hepatology*, **57**, 775-785 (2013)
557. G. Bhakta, B. Rai, Z. X. H. Lim, J. H. Hui, G. Stein, A. J. van Wijnen, V. Nurcombe, G. D. Prestwich, and S. M Cool, Ph.D., Hyaluronic acid-based hydrogels functionalized with heparin that support controlled release of bioactive BMP-2, *Biomaterials*, **33**, 6113-6122 (2012).

558. G.D. Prestwich, I. Erickson, T.I. Zarembinski, M. West, and W.P. Tew, "The Translational Imperative: Making Cell Therapy Simple and Effective," *Acta Biomaterialia*, **8**, 4200-4207 (2012).
559. N. Oikonomou, M-A. Mouratis, A. Tzouveleakis, C. Valavanis, G. Vilaras, A. Karameris, G. D. Prestwich, G. Jiang, D. Bouros and V. Aidinis, "Pulmonary autotaxin contributes to the pathogenesis of pulmonary fibrosis, *Amer. J. Resp. Crit. Care Med.*, **47**, 566-574 (2012).
560. G. D. Prestwich, S. Bhatia, C. K. Breuer, S. Dahl, C. Mason, R. McFarland, C. Mason, D. J. McQuillan, J. Sackner-Bernstein, J. Schox, W. E. Tente, and A. Trounson, "Insider Views: What is the greatest regulatory challenge in the translation of biomaterials to the clinic?" *Science Translational Medicine*, **4**, 160cm14 (2012).
561. G. Yang, H. Zhang, and G. D. Prestwich, Tissue-Engineered "Metastases": Treatment of Hepatic Colon Tumors with a Dual Action Autotaxin Inhibitor-Lysophosphatidic Acid Receptor Antagonist, *J. Cancer Res. Updates*, **1**, 69-77 (2012).
562. A. H. Park, D. Hoyt, D. Britt, S. Chase, K. Tansavatdi, L. Hunter, L. McGill, X. Sheng, A. Skardal, and G. D. Prestwich, "Crosslinked hydrogel and polyester resorbable ventilation tubes in a chinchilla model," *The Laryngoscope*, **123**, 1043-1048 (2013).
563. G. D. Prestwich, "Culture of impact: faculty as mentors for student entrepreneurs," *Science Translational Medicine* **5**, 169ed2 (2013).
564. S. Oottamasathien, W. Jia, L. McC. Roundy, J. Zhang, X. Ye., A. C. Hill, J. Savage, W. Y. Lee, A. M Hannon, S. Milner, and G. D. Prestwich, "Physiologic relevance of LL-37 induced bladder inflammation and mast cells," *J. Urology*, **190**, 1596-1602 (2013).
565. G. Jiang, A. Inoue, J. Aoki, and G. D. Prestwich, "Phosphorothioate analogues of *sn*-2 radyl lysophosphatidic acid (LPA) as metabolically stabilized agonists for LPA receptors", *Bioorg Med. Chem. Lett.* **23**, 1865-1869 (2013).
566. G. D. Prestwich, "Delivery, retention, and engraftment of progenitor cells in cell therapy," *Biomatter* **3**, 1-2 (2013).
567. L. McCoard Roundy, W. Jia, J. Zhang, X. Ye, G. D. Prestwich, S. Oottamasathien, LL-37 induced cystitis and the recept for advanced glycation endproduct (RAGE) pathway, *Adv. Biosci. Biotech.*, **4**, 1-8 (2013).
568. I. Nikipoulou, E. Kaffe, I. Sevastou, I. Sirioti, M. Samiotaki, D. Madan, G. D. Prestwich, and V. Aidinis, Metabolically-stabilized phosphonate analog of lysophosphatidic acid attenuates collagen-induced arthritis, *PLoS ONE*, **8**(7): e70941 (2013).
569. G. Bhakta, Z. X. H. Lim, B. Rai, T. Lin, J. H. Hui, G. D. Prestwich, A. J. van Wijnen, V. Nurcombe, S. M. Cool, The influence of collagen and hyaluronan matrices on the delivery and bioactivity of bone morphogenetic protein-2 and ectopic bone formation, *Acta Biomaterialia*, **9**, 9098-9106 (2013).
570. V. Swarup, T. Hsiao, J. Zhang, G. Prestwich, K. Balagurunathan, and V. Hlady, "Exploiting differential surface display of chondroitin sulfate variants for directing neuronal growth," *J. Am. Chem. Soc.*, **135**, 13488-13494 (2013).
571. D. Madan, C. G. Ferguson, W. Y. Lee, G. D. Prestwich, and C. A. Testa, Non-invasive imaging



- of autotaxin-expressing tumors using an enzyme-activated near-infrared fluorogenic substrate, *PLoS ONE*, **8**(11): e79065 (2013).
572. G.Y. Park, Y. G Lee, E. Berdyshev, S Nyenjhuis, J. Du, P. Fu, I. A Gorshkova, Y. Li, S. Chung, M Karpurapu, J. Deng, R. Rajan, L. Xiao, H. A. Jaffe, S. J. Corbridge, E. A. B. Kelly, N. N. Jarjour, J. Chun, G. D. Prestwich, V. Aidinis, A. J. Morris, S. S. Smyth, S. J. Acerman, V. Natarajan, J. W. Christman, "Autaxin production of lysophosphatidic acid mediates allergic asthmatic inflammation," *Am. J. Resp. Critical Care Med.*, **188**, 928-940 (2013).
573. A. Chopra, M. E. Murray, D. Raz-Ben Aroush, M. Mendez, R. Halleluyan, D. Restle, P. A. Galie, F. Byfield, R. Bucki, C. Marcinkiewicz, G. D. Prestwich, T. I. Zarembinski, C. S. Chen, E. Puré, J. Y. Kresh, and P. A. Janmey, "Augmentation of integrin-mediated mechanotransduction by hyaluronic acid," *Biomaterials*, **35**, 71-82 (2014).
574. W. Y. Lee, J. R. Savage, J. Zhang, W. Jia, S. Oottamasathien, and G. D. Prestwich, Prevention of anti-microbial peptide LL-37 induced ATP release in the urinary bladder by a modified glycosaminoglycan, *PLoS ONE*, **8**(10) e77854 (2013).
575. S. Misra, S. Ghatak, A. Vyas, P. O'Brien, R. R. Markwald, M. Khetmalas, V. C. Hascall, J.B. McCarthy, N. K. Karamanos, M. I. Tammi, R. H. Tammi, G. D. Prestwich, and S. Padhye, Isothiocyanate analogs targeting CD44 receptor as an effective strategy against colon cancer, *Med. Chem. Res.* **23**, 3836-3851 (2014).
576. A. Han, X. Liu, G. D. Prestwich, and L. Zang, Fluorescent sensor for Hg<sup>2+</sup> detection in aqueous solution, *Sensors & Actuators. B. Chemical*, **198**, 274-277 (2014).
577. G. D. Prestwich and Kevin Healy, "Why Cell Therapy Needs an ECM Mimetic," invited editorial, *Expert Opinion in Biological Therapy*, **15**, 3-7 (2015).
578. B. Wirostko, B. K. Mann, and G.D. Prestwich, "Clinical Development of Hyaluronan-Based Semisynthetic Extracellular Matrices," *Adv. Wound Care*, **3**, 708-716 (2014).
579. R. Zhuo, K. Kosak, S. Sankar, E. T. Wiles, Y. Sun, J. Zhang, J. Ayello, G. D. Prestwich, P. J. Shami, M. S. Cairo, S. L. Lessnick and W. Luo, "Targeting glutathione S-transferase M4 in Ewing sarcoma, *Frontiers in Pediatrics*, **2**:83. doi: 10.3389/fped.2014.00083 (2014).
580. J. Woodman, M. S. Suh, J. Zhang, Y. Kondaveeti, D. J. Burg, B. A. White, G. D. Prestwich, and L., Carboxymethylhyaluronan-stabilized nanoparticles for anticancer drug delivery, *Int. J. Cell Biol.* (Special Issue – Hyaluronan), dx.doi.org/10.1155/2015/249573 (2015).
581. J. Alt, X. Qin, A. Pulsipher, Q. Orb, R. R. Orlandi, J. Zhang, A. Schults, W. Jia, A.P. Presson, G. D. Prestwich, and S. Oottomasathien, Topical cathelicidin (LL-37), an innate immune peptide, induces acute olfactory inflammation in a mouse model, *Int. Forum Allergy Rhinitis*, **5** (12), 1141-1150 (2015)
582. M. Murph, G. W. Jiang, M. K. Altman, W. Jia, D. T. Nguyen, J. . Fambrough, W. J. Hardman, H. T. Nguyen, S. K. Tran, A. A. Alshamrani, J. Zhang, A. Madan, and G. D. Prestwich, Vinyl Sulfone Analogs of Lysophosphatidylcholine Irreversibly Inhibit Autotaxin and Prevent Angiogenesis in Melanoma *Bioorg. Med. Chem.* **23**, 5999-6013, doi: 10.1016/j.bmc.2015.06.054 (2015)
583. M-A. Mouratis, N. Oikonomou, C. Magkrioti, G. D. Prestwich, E. Kaffe, and V. Aidinis, Autotaxin-and endotoxin-induced acute lung injury, *PLOS One*, **10**(7):e0133619 (2015).

584. M. E. Skindersoe, K. A. Krogfelt, A. Blom, G. Jiang, J. Zhang, G. D. Prestwich, J. P. Mansell, Human MG63 osteoblasts and methicillin resistant *S. aureus* responses to lysophosphatidate-functionalised titanium, *PLoS ONE*, **10**(11) e0143509 (2015)
585. D. Ryskamp, A. Frye, T. Phuong, Y. Oleg, A. O. Jo, Y. Xu, M. Lakk, A. Iuso, P. Barabas, S. N. Redmon, B. K. Ambati, G. Hageman, T. Torrejon, G. D. Prestwich, and D. Krizaj, TRPV4 signals generate and transduce intraocular pressure in glaucoma, *Nature Scientific Reports* **11** (6) 30583 (2016).
586. C. B. Highley, G. D. Prestwich, and J. A. Burdick, Recent advances in hyaluronic acid hydrogels for biomedical applications, *Curr. Opin. Biotech*, **40**, 35-40 (2016)
587. J. Savage, A. Pulsipher, N. V. Rao, T. P. Kennedy, G. D. Prestwich, M. E. Ryan, and W. Y. Lee, A modified glycosaminoglycan, GM-0111, inhibits molecular signaling involved in periodontitis, *PLoS ONE*, **11** (6) e0157310 (2016).
588. G. Dorman, H. Nakamura, A. Pulsipher, and G. D. Prestwich, The life of pi star: Exploring the exciting and forbidden worlds of the benzophenone photophore, *Chem. Rev.*, **116** (24), 15284–15398; doi 10.1021/acs/chemrev.6b00342 (2016).
589. A. Pulsipher, X. Qin, A. Thomas, G. D. Prestwich, S. Oottamasathien and J. Alt, Prevention of sinonasal inflammation by a synthetic glycosaminoglycan, *Int. Forum Allergy & Rhinitis*, **7** (2), 177-184 (2017).
590. A. J. Stock, A. Kasus-Jacobi, J. D. Wren, V. H. Sjoelund, G. D. Prestwich, and H. A. Pereira, The role of neutrophil proteins on the amyloid beta-RAGE axis, *PLoS ONE*, **11** (9) e0163330 (2016).
591. W. Jia, A.J. Schults, X. Ye, J. A. Alt, G. D. Prestwich, and S. Oottamasthien, Bladder pain in LL-37 interstitial cystitis and painful bladder syndrome model, *Am. J. Clin. Exp. Urol.*, **5** (2): 10-17 (eCollection PMID 29034266) (2017)
592. M. M. Jensen, W. Jia, K. Isaacson, A. Schults, J. Cappello, G. D. Prestwich, S. Oottamasathien, and H. Ghandehari, Silk-elasticlike protein polymers enhance the efficacy of a therapeutic glycosaminoglycan for prophylactic treatment of radiation-induced proctitis, *J. Controlled Rel.*, <http://dx.doi.org/10.1016/j.jconrel.2017.02.025> (2017)
593. K. Cornish, D. J. Scott, W. Xie, C. J. D. Mau, Y-F. Z. Zheng, X-h. Liu, G. D. Prestwch, Unusual subunits are directly involved in binding substrates for natural rubber biosynthesis in multiple plant species, *Phytochem.*, **156**, 55-72 (2018)
594. J. Paderi, G. Prestwich, A. Panitch, T. Boone, and K. Stuart, Glycan Therapeutics: Resurrecting an Almost Pharma-Forgotten Drug Class, *Adv. Therapeutics*, DOI:10.1002/adtp.201800082 (2018).
595. J. A. Alt, B. M. Davis, W. Y. Lee, J. R. Savage, T. P. Kennedy, G. D. Prestwich, A. Pulsipher, A synthetic glycosaminoglycan reduces sinonasal inflammation in a murine model of chronic rhinosinusitis, *PLOS ONE*, **13** (9):e0204609 (2018).
596. H. Kabra, T. Walimbe, K. Stuart, C. Indey, S. Jalgaonkar, E. Ikwa, T. Skurnac, J. Chen, A. Wooley, N. Snead, N. Bachtell, D. Leeming, M. Karsdal, G. Prestwich, A. Panitch, J. Paderi,

- Localized inhibition of platelets and PDGF by a matrix targeted glycan mimetic significantly attenuates liver fibrosis, *Biomaterials*, **269**, 120538 (2020).
597. M J. Velasquez-Hernandez, E. Astria, S. Winkler, W. Liang, H. Amenitsch, A. Poddar, R. Shukla, G. Prestwich, J. Paderi, C. J. Doonan, P. Falcaro, Modulation of metal-azolate frameworks for the tunable release of encapsulated glycosaminoglycans, *Chem. Sci.*, **11**, 10835-10843 (2020).
598. W. Zhang, E. Wauthier, G. Lanzoni, S. Simpson, W. Pitman, A. Allen, O. Lozoya, D. Gerber, G. Prestwich, X. Wang, J. Dominguez-Bendala, Z. He, P. Sethupathy, C. Adin, K. Matthews, J. Piedrahita, L. McAdams Reid, Patch grafting. Strategies for transplantation of organoids into solid organs such as liver, *Biomaterials*, **277**, 121067 (2021).
599. Y. Gu, V. Raja, H-M. Lee, H. Hong, G. Prestwich, M. E. Ryan, Therapeutic potential of a novel semi-synthetic sulfated polysaccharide to suppress inflammatory mediators in *P. gingivalis* LPS stimulated human monocytes/macrophages, *J. Inflammation*, **18**, 26 (2021).
600. G. N. Duda, D. W. Grainger, R. E. Guldborg, G. D. Prestwich, B. Rauw, H-D. Volk, "Measuring translational impact beyond common business or academic metrics," *Science Translational Medicine*, in press (2022).
601. V. Raja, Y. Gu, H-M. Lee, J. Deng, G. Prestwich, M. E. Ryan, SAGE: Novel therapy to reduce inflammation in a naturally occurring dog model of periodontal disease, *J. Exper. Pharmacol.*, **14**, 117-129 (2022).
602. W. Zhang, G. Lanzoni, H. Hani, X. Yi, D. Overi, L. Shi, S. Simpson, A. Allen, C. Suitt, J. A. Ezzell, D. Alvaro, V. Cardinale, E. Gaudio, G. Carpino, G. Prestwich, J. Dominguez-Bendala, D. Gerber, P. Sethupathy, K. Mathews, J. Piedrahita, C. Adin, Z. He, E. Wauthier, L. Reid, Patch grafting strategies of stem/progenitor organoids. Strategies for cell therapies for solid organs, and exemplified in liver and pancreas. *Cell Stem Cell*, dx.doi.org/10.2139/ssrn.377103 (2022).
603. D. Bhere, S. H. Choi, P. van de donk, D. Hope, K. GorXzak, A. Kunnumal, J. Khalsa, E. R. Lechlch, C. Reinshagen, V. Leon, N. Nissar, W. Bi, C. Feng, H. Li, Y. S. Zhang, S. Liang, N. Vasdev, W. I. Essayd, P. Valdes, A. Golby, N. Banouni, A. Pallagina, R. Abdi, B. Fury, S. Smirnakis, A. Lowe, B. Reeve, A. Hiller, E. Chiocca, G. D. Prestwich, H. Wakimoto, G. Bauer, and K. Shah, "Target receptor identificalon and subsequent treatment of resected brain tumors with encapsulated and engineered allogeneic stem cells, *Nature Commun.*, 13:2810, doi.org/10.1038/s41467-022-30558-3 (2022).
604. Zhang W, Wang X, Lanzoni G, Wauthier E, Overi D, Wang Y, Oikawa T, Simpson S, Allen A, Suitt C, Jhirad A, Krollk J, Gerber D, Dominguez-Bendala J, Alvaro D, Cardinale V, Gaudio E, Carpino G, Prestwich G, Adin C, Mathews K, Piedrahita J, Sethupathy P, He Z and Reid L.M. The network of co-hepato/pancreatic stem/progenitors in postnatal pigs versus that in humans. *Regenerative Medicine*, <https://doi.org/10.21203/rs.3.rs-1662786/v1>
605. Zhang W, Lanzoni G, Hani H, Yi X, Overi D, Shi L, Simpson S, Allen A, Suitt C, Ezzell JA, Alvaro D, Cardinale V, Gaudio E, Carpino G, Prestwich G, Dominguez-Bendala J, Gerber D, Mathews K, Piedrahita J, Wauthier E, He Z, Adin C, Sethupathy P, and Reid L.M. Patch Grafting of Organoids of Stem/progenitors into Solid Organs Can Correct Genetic-Based Disease States, *Biomaterials*, **288**, 121647 (2022).

606. Duda GN, Grainger DW, Guldberg RE, Goldsobel, G, Prestwich, GD, Rauw, B, Volk H-D, Measuring translational research impact requires reaching beyond current metrics, *Sci. Transl. Med.* **15**, eabp8258 (2023)

### **Books and Edited Symposia**

1. G.D. Prestwich and G.J. Blomquist, editors, *Pheromone Biochemistry*, Academic Press, New York (1987).
2. G.D. Prestwich, guest editor, symposium issue on "Bio-organic Chemistry of Communication Systems," *J. Chem. Ecol.*, **12**, No. 2 (1986).
3. G.D. Prestwich and H. Bayley, section editors, "Interaction, Assembly, and Processing," *Curr. Opin. Chemical Biology* (February 1999).
4. L. Feng and G.D. Prestwich, editors, *Functional Lipidomics*, CRC Press/Taylor & Francis, New York (2006).

### **Book Chapters**

1. G.D. Prestwich, "Evolution of Chemical Defenses in Termites," in *Social Insects in the Tropics*, Universite de Paris Presse, pp. 85-95 (1982).
2. G.D. Prestwich, "Chemical Warfare by Termite Soldiers," McGraw Hill 1982 *Yearbook of Science and Technology*, pp. 451-453 (1982).
3. G.D. Prestwich, "Chemical Systematics of Termite Exocrine Secretions," *Ann. Rev. Ecol. Syst.*, **14**, 287-311 (1983).
4. G.D. Prestwich, "Defense Mechanisms of Termites," *Ann. Rev. Entomol.*, **29**, 201-232 (1984).
5. G.D. Prestwich, R. Yamaoka, S. Phirwa, A. De Palma, M. Angelastro, and A.K. Gayen, "Harnessing Insect-Specific Enzymes to Activate Novel Pro-Insecticides," *ACS Symposium Series 255: Pesticide Synthesis Through Rational Approaches* (P.S. Magee, G.K. Kohn, and J.J. Menn, eds.) pp. 127-143 (1984).
6. J.K. Koeppe, G.E. Kovalick, and G.D. Prestwich, "Photoaffinity Labeling of Juvenile Hormone-Binding Proteins in *Leucophaea maderae*," in *Biosynthesis, Metabolism and Mode of Action of Invertebrate Hormones* (J. Hoffmann and M. Porchet, eds.), pp. 438-443, Springer-Verlag, New York (1984).
7. G.D. Prestwich, "Isolation and Identification of Diterpenes from Termite Soldiers," *Methods in Enzymology (Steroids and Isoprenoids)*, **110**, 417-425 (1985).
8. G.D. Prestwich, J.K. Koeppe, G.E. Kovalick, J.J. Brown, E.S. Chang, and A.K. Singh, "Experimental Techniques for Photoaffinity Labeling of Juvenile Hormone Binding Proteins of Insects with Epoxyfarnesyl Diazoacetate," *Methods in Enzymology (Steroids and Isoprenoids)*, **111**, 509-530 (1985).

9. G.D. Prestwich, "Chemical Defense and Self-Defense in Termites," *Natural Products Chemistry* (Atta-ur-Rahman, ed.), Springer-Verlag, Berlin, pp. 318-329 (1986).
10. G.D. Prestwich, R.G. Vogt, and Y.-S. Ding, "Chemical Studies of Pheromone Catabolism and Reception," in *Molecular Entomology* (J.H. Law, ed.) Alan R. Liss, Inc., pp. 57-66 (1987).
11. G.D. Prestwich, "Chemical Studies of Pheromone Reception and Catabolism," in *Pheromone Biochemistry* (G.D. Prestwich and G.J. Blomquist, eds.) Academic Press, pp. 473-527 (1987).
12. G.D. Prestwich, W.-s. Eng, and M.F. Boehm, "Radioligands for Identification of Receptors for Juvenile Hormones and JH Analogs," *Molecular Biology of Invertebrate Development* (J.D. O'Connor, ed.), pp. 279-288 (1987).
13. G.D. Prestwich, S. Robles, and M. Mohamed, "A Biochemical Basis for Caste Differentiation," in *Chemistry and Biology of Social Insects* (J. Eder and H. Rembold, eds.), Verlag J. Peperny, Munich, pp. 314-315 (1987).
14. G.D. Prestwich, S. Sen, and A.K. Singh, "Biosynthesis of Diterpenes in *Nasutitermes*," in *Chemistry and Biology of Social Insects* (J. Eder and H. Rembold, eds.), Verlag J. Peperny, Munich, pp. 408-409 (1987).
15. M. Mohamed and G.D. Prestwich, "Hemolymph Juvenile Hormone Binding Proteins of *Reticulitermes flavipes*: Induction by Methoprene and Suppression by Pheromones," in *Endocrinological Frontiers of Physiological Insect Ecology* (F. Sehnal, A. Zabza, and D.L. Denlinger, eds.), Wroclaw Technical University Press, Wroclaw, Poland, pp. 975-981 (1988).
16. G.D. Prestwich, M.F. Boehm, W.-s. Eng, P. Kulcsár, N. Maldonado, S. Robles, U. Sinha, and C. Wawrzenczyk, "New Radioligands for Characterization of JH and IGR Receptors: Synthesis and *In Vitro* Assay," in *Endocrinological Frontiers of Physiological Insect Ecology* (F. Sehnal, A. Zabza, and D.L. Denlinger, eds.), Wroclaw Technical University Press, Wroclaw, Poland, pp. 963-973 (1988).
17. F.X. Webster, G.D. Prestwich, S.-K. Park, L.A. Deuring, A. Daljeet, and B.L. Bentley, "Isolation and Tentative Identification of Rojofuran, an Unstable Furanoditerpene from the Defense Secretion of a Venezuelan *Nasutitermes* Species," in *Endocrinological Frontiers of Physiological Insect Ecology* (F. Sehnal, A. Zabza, and D.L. Denlinger, eds.), Wroclaw Technical University Press, Wroclaw, Poland, pp. 449-452 (1988).
18. G.D. Prestwich, R.G. Vogt, Y.-S. Ding, S.McG. Graham, L. Streinz, W.-C. Sun, M.L. Tasayco J., and F.X. Webster, "Disruption of Pheromone Binding and Catabolism: Enzyme Inhibitors and Receptor Affinity Labels," in *Endocrinological Frontiers of Physiological Insect Ecology* (F. Sehnal, A. Zabza, and D.L. Denlinger, eds.), Wroclaw Technical University Press, Wroclaw, Poland, pp. 983-995 (1988).
19. P. Kulcsár, G.D. Prestwich, and D.E. Sonenshine, "Detection of Binding Proteins for Juvenile Hormone-Like Substances in Ticks by Photoaffinity Labeling," for *Host Regulated Developmental Mechanisms in Vector Arthropods. II.*, University of Florida-IFAS, Vero Beach, Florida, pp. 18-23 (1989).

20. D. Borovsky, D.A. Carlson, I. Ujváry, and G.D. Prestwich, "Synthesis and Degradation of JH III in the Mosquito *Aedes aegypti*," for *Host Regulated Developmental Mechanisms in Vector Arthropods II*, University of Florida-IFAS, Vero Beach, Florida, pp. 24-32 (1989).
21. G.D. Prestwich, "Proinsecticides: Metabolically Activated Toxicants," in *Safer Pesticides: Development and Use*, (E. Hodgson and R. Kuhr, eds., Marcel Dekker, Inc., pp. 279-333 (1990).
22. G.D. Prestwich, "Molecular Control of Behaviour and Gene Expression in Insects: How Pheromones and Hormones Work," in *Advances in the Chemistry of Insect Control*, (L. Crombie, ed.) Royal Society of Chemistry, Cambridge, England, pp. 235-246 (1990).
23. G.D. Prestwich, "Tritium-Labeled Hormones, Pheromones, and Photoaffinity Labels," in *Isotopes in the Physical and Biomedical Sciences, Vol. 1B* (J.R. Jones and E. Buncel, eds.) Elsevier, pp. 137-178 (1991).
24. E.S. Chang, W.A. Hertz, and G.D. Prestwich, "Reproductive Endocrinology of the Penaeid Shrimp, *Sicyonia ingentis*: Steroid, Peptide, and Terpenoid Hormones," Proc. U.S.-Japan Natural Resources Conference on Aquaculture, *NOAA Technical Reports NMFS 106*, 1-6 (1992).
25. G.D. Prestwich, "Adventures in Photoaffinity Labeling, Hormone Carriers and Receptors in Arthropods," *Insect Chemical Ecology*, (I. Hrdy, ed.) SPB Academic Publishing, The Hague, The Netherlands, pp. 21-33 (1991).
26. I. Ujváry and G.D. Prestwich, "Syntheses of Radiolabelled Terpenoid Diazoacetate and Diazoketone Photoaffinity Analogs for Invertebrate Hormone Binding and Receptor Studies," *Insect Chemical Ecology*, (I. Hrdy, ed.) SPB Academic Publishing, The Hague, The Netherlands, pp. 163-168 (1991).
27. G.D. Prestwich and J.F. Marecek, "Chemical Modifications of Inositol Trisphosphates: Tritiated, Fluorinated, and Phosphate-Tethered Affinity Analogs," ACS Symposium Series No. 463, *Inositol Phosphates and Related Compounds: Synthesis and Therapeutic Potential*, A. Reitz, ed., Chapt. 9, pp. 122-131 (1991).
28. G.D. Prestwich, K. Touhara, J.K. Atkinson, K.A. Lerro, B. Latli, B.M. Okot-Kotber, and I. Ujváry, "Hot JH: Using Radioligands and Photoaffinity Labels to Decipher the Molecular Action of Juvenile Hormone," in *Insect Juvenile Hormone Research: Fundamental and Applied Approaches V* (B. Mauchamp, F. Couillaud, and J.C. Baehr, eds.), INRA, Paris, pp. 247-256 (1992).
29. M. Cusson, G.D. Prestwich, B. Stay, and S.S. Tobe, "Evidence for Allatostatin Receptor Proteins in the Corpora Allata of the Cockroach *Diploptera punctata*, as Demonstrated by Photoaffinity Labeling," in *Insect Juvenile Hormone Research: Fundamental and Applied Approaches V* (B. Mauchamp, F. Couillaud, and J.C. Baehr, eds.), INRA, Paris, pp. 183-191 (1992).
30. R. Pietruszko, E.E. Blatter, D.P. Abriola, and G.D. Prestwich, "Localization of Cysteine 302 at the Active Site of Aldehyde Dehydrogenase," in *Enzymology and Molecular Biology of Carbonyl Metabolism* (H. Weiner and T.G. Flynn, eds.) Plenum Press, pp. 19-30 (1991).

31. G. D. Prestwich and G. Du, "Pheromone-Binding Proteins, Pheromone Recognition, and Signal Transduction in Moth Olfaction," in *Insect Pheromone Research: New Directions* (R.T. Cardé and A.K. Minks, eds.), Chapman & Hall, New York, New York, pp. 131-143 (1997).
32. S.M. Voglmaier, M.E. Bembenek, A.I. Kaplan, G. Dormán, J.D. Olszewski, G.D. Prestwich, and S.H. Snyder, "Purification and Assay of Inositol Hexakisphosphate Kinase and Diphosphoinositol Pentakisphosphate Kinase," in *Signaling by Inositol Lipids and Inositol Phosphates* (S.B. Shears, ed.), Oxford University Press, pp. 195-201 (1997).
33. A.B. Theibert, G.D. Prestwich, T.R. Jackson, and L.P. Hammonds-Odie, "The Purification and Assay of Inositide Binding Proteins," in *Signaling by Inositol Lipids and Inositol Phosphates* (S.B. Shears, ed.), Oxford University Press, pp. 117-150 (1997).
34. P.S. Reddy, G.D. Prestwich, and E.S. Chang, "Crustacean Hyperglycemic Hormone Gene Expression in the Lobster *Homarus americanus*," in *Advances in Comparative Endocrinology, Volume 1* (S. Kawashima and S. Kikuyama, eds.), Moduzzi Editore, Bologna, S.p.A., Bologna, Italy, pp. 51-56 (1997).
35. G.D. Prestwich, D.M. Marecak, J.F. Marecek, K.P. Vercruysse, and M.R. Ziebell, "Chemical Modification of Hyaluronic Acid for Drug Delivery, Biomaterials, and Biochemical Probes," in *The Chemistry, Biology, and Medical Applications of Hyaluronan and its Derivatives* (T. C. Laurent, ed.), Portland Press, London, pp. 43-65 (1998).
36. G.D. Prestwich, A. Chaudhary, J. Chen, L. Feng, B. Mehrotra, and J. Peng, "Probing Phosphoinositide Polyphosphate Binding to Proteins," in *Phosphoinositides: Chemistry, Biochemistry and Biomedical Applications* (K.S. Bruzik, ed.), American Chemical Society, Washington, DC, vol. 718, pp. 24-37 (1999).
37. I. Abe and G.D. Prestwich, "Squalene Epoxidase and Oxidosqualene: Lanosterol Cyclase Key Enzymes in Cholesterol Biosynthesis," in *Comprehensive Natural Products: Volume 2. Isoprenoid Biosynthesis* (D.H.R. Barton and K. Nakanishi, eds.) Elsevier Science, London, pp. 267-298 (1999).
38. G.D. Prestwich, Y. Luo, M.R. Ziebell, K.P. Vercruysse, K.R. Kirker, and J.S. MacMaster, "Chemically Modified Hyaluronan: New Biomaterials and Probes for Cell Biology," in *New Frontiers in Medical Sciences: Redefining Hyaluronan*, Padua, Italy (G. Abatangelo and P.H. Weigel, eds.) Elsevier Science, pp. 181-194 (2000).
39. Y. Luo, K.R. Kirker, and G.D. Prestwich, "Modification of Natural Polymers: Hyaluronic Acid," in *Methods of Tissue Engineering* (A. Atala and R. Lanza, eds.), Academic Press, Orlando, Florida, pp. 539-553 (2002).
40. G.D. Prestwich, Y. Luo, K.R. Kirker, M.R. Ziebell, and J. Shelby, "Hyaluronan Biomaterials for Targeted Drug Delivery and Wound Healing," in *HA 2000*, Woodhead Publishing Ltd., Abington, UK, pp. 277-284 (2002).
41. Y. Luo, K.R. Kirker, and G.D. Prestwich, "Hyaluronic Acid Hydrogel Film: A New Biomaterial for Drug Delivery and Wound Healing," in *HA 2000*, Woodhead Publishing Ltd., Abington, UK, pp. 271-276 (2002).

42. L. Feng, C.G. Ferguson, Beth E. Drees, P.O. Neilsen, and G.D. Prestwich, "Defining the Lipidome: A New Target for Therapeutics," in *Chemical Genomics* (F. Darvas, A. Guttman, and G. Dormán, eds.), Marcel Dekker, Inc., New York, New York, pp. 215-274 (2004).
43. X.Z. Shu and G.D. Prestwich, "Therapeutic Biomaterials from Chemically Modified Hyaluronan, in *Chemistry and Biology of Hyaluronan* (H.G. Garg and C.A. Hales, eds.), Elsevier Press, Amsterdam, pp. 475-504 (2004).
44. X.Z. Shu, Y. Liu, and G.D. Prestwich, "Injectable, *In Situ*-Crosslinkable Biomimetic Hydrogels for Tissue Engineering," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Applications, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 415-419 (2005).
45. K.R. Kirker, Y. Luo, S.E. Morris, J. Shelby, and G.D. Prestwich, "Glycosaminoglycan Hydrogels for Wound Healing," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Application, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 397-400 (2005).
46. Y. Liu, X.Z. Shu, S.D. Gray, and G.D. Prestwich, "Tissue Growth in a Disulfide-Crosslinked Hyaluronan-Gelatin Sponge," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Applications, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 377-380 (2005).
47. Y. Liu, H. Li, X.Z. Shu, S.D. Gray, and G.D. Prestwich, "Reduction of Post-Operative Adhesions by *In Situ* Crosslinked Hyaluronan Hydrogels," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Applications, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 381-384 (2005).
48. G.D. Prestwich, X.Z. Shu, Y. Liu, K.R. Kirker, H. Li, J. Shelby, S.E. Morris, and S.D. Gray, "*In Situ* Crosslinkable Synthetic Extracellular Matrices For Tissue Repair and Prevention of Surgical Adhesions," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Applications, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 409-414 (2005).
49. R.R. Orlandi, H. Li, X.Z. Shu, Y. Liu, and G.D. Prestwich, "Preventing Ostia Closure During Sinus Surgery Using *In Situ* Crosslinked Hyaluronan Hydrogels," in *Hyaluronan: Structure, Metabolism, Biological Activities, Therapeutic Applications, Volume I* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 405-408 (2005).
50. J. Tanyi, D. Crotzer, J. Wolf, S. Yu, Y. Hasegawa, J. Lahad, K.W. Cheng, M. Umezu-Goto, G.D. Prestwich, A. Morris, R.A. Newman, E.A. Felix, R. Lapis, and G.B. Mills, "Functional Lipidomics: Lysophosphatidic Acid as a Target for Molecular Diagnosis and Therapy of Ovarian Cancer," in *Functional Lipidomics* (L. Feng and G.D. Prestwich, eds.), CRC Press / Taylor & Francis, New York, pp.101-123 (2006).
51. L. Feng, C. Ferguson, P.O. Neilsen, L. Chakravarty, P.W. Rzepecki, and G.D. Prestwich, "Methods of Probing Phosphoinositides-Protein Interactions," in *Functional Lipidomics* (L. Feng and G.D. Prestwich, eds.), CRC Press / Taylor & Francis, New York, pp. 189-210 (2006).
52. Q. Chen, S. Cai, K.G. Shadrach, G.D. Prestwich, and J.G. Hollyfield, "Spacrcan Binding to Hyaluronan: Molecular and Biochemical Studies," in *Hyaluronan: Structure, Metabolism,*



*Biological Activities, Therapeutic Applications, Volume II* (E.A. Balazs and V.C. Hascall, eds.), Matrix Biology Institute, Edgewater, New Jersey, pp. 739-746 (2005).

53. Prestwich, G. (2008), "Visualizing and manipulating phosphoinositide and phospholipid signaling", in Austin, D. (ed.), *Chemical Biology: The role of Chemistry in our fundamental understanding of Biology*, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at <http://www.hstalks.com/?t=BL0331259-Prestwich>)
54. J. W. Kuo and G. D. Prestwich, "Chapter 73. Hyaluronic Acid" in *Materials of Biological Origin – Materials Analysis and Implant Uses, Comprehensive Biomaterials, Vol. 2* (eds. P. Ducheyne, K. Healy, D. Hutmacher, J. Kirkpatrick), Elsevier pp. 239-259 (2011).
55. G. D. Prestwich, T. Ghaly, P. Brudnicki, B. Ratliff, and M. S. Goligorsky, "Bioartificial Stem Cell Niches: Engineering a Regenerative Microenvironment," Chapter 16, pp 245-256 in *Regenerative Nephrology* (M. S. Goligorsky, ed.), Elsevier Academic Press, London, San Diego (2011).
56. R. C. Condie and G. D. Prestwich, "Designing Clinically Useful Substitutes for the Extracellular Matrix," Chapter 1, B. Vernon, ed., *Injectable Biomaterials: Science and Application*, Woodhead Publishing, pp. 3-23 (2011).
57. D. Nguyen, O. Nguyen, H. Zhang, G. D. Prestwich, and M. M. Murph, "Reduction of Cell Proliferation and Viability in MeWo Melanoma Cells by a Bromophosponate Analog of Lysophosphatidic Acid," *Melanoma*, ISBN:978-953-307-293-7. (March 8, 2011) <http://www.intechopen.com/articles/show/title/a-bromophosponate-analogue-of-lysophosphatidic-acid-surpasses-dacarbazine-in-reducing-cell-prolifer>
58. N. V. Rao, G. D. Prestwich, J. R. Hoidal, and T. P. Kennedy, "Low Anti-Coagulant Heparins in the Treatment of Metastasis," *Melanoma*, ISBN:978-953-307-293-7. (March 2011) <http://www.intechopen.com/articles/show/title/low-anticoagulant-heparins-in-the-treatment-of-metastasis>
59. G. D. Prestwich and S. Atzet, "1.2.7. Engineered Natural Materials" in *Biomaterials Science: An Introduction to Materials in Medicine* (Ratner, B.D., Hoffman, A.S., Lemmons, J.E., and Schoen, F.J., eds) pp. 195-209 (2013).
60. B. K. Mann and G. D. Prestwich, *Creating Commercial Value from Biomaterials*, In, *Translational Regenerative Medicine* (A. Atala, A. Allickson, eds.), Elsevier (2014).

### **Patents and Patent Applications**

1. G.D. Prestwich, "Attractant Termiticidal Compounds, Compositions and Methods of Use Therefor," **U.S. Patent No. 4,455,441** (June 19, 1984).
2. G.D. Prestwich, "29-Fluorophytosterol Insecticides, Composition and Method of Use Therefor," **U.S. Patent No. 4,452,793** (June 5, 1984).
3. G.D. Prestwich, "Reactive Pheromone Mimics for Disruption of Mating by Insects," **U.S. Patent No. 4,544,504** (October 1, 1985).

4. G.D. Prestwich, "Fluorinated Cellulose Esters and the Use Thereof as Termiticidal Compositions," **U.S. Patent No. 4,582,901** (April 15, 1986).
5. J.-w. Kuo, D.A. Swann, and G.D. Prestwich, "Water-Insoluble Derivatives of Hyaluronic Acid and Their Methods of Preparation and Use," **U.S. Patent No. 5,356,883** (October 18, 1994).
6. B.S. Coller and G.D. Prestwich, "Peptidase-Resistant Thrombin Receptor Peptide Ligand," **U.S. Patent No. 5,455,228** (October 3, 1995).
7. T. Pouyani and G.D. Prestwich, "Functionalized Derivatives of Hyaluronic Acid," **U.S. Patent No. 5,616,568** (April, 1, 1997).
8. J.-w. Kuo, D.A. Swann, and G.D. Prestwich, "Water-Insoluble Derivatives of Hyaluronic Acid and Their Methods of Preparation and Use," **U.S. Patent No. 5,502,081** (March 26, 1996) (Continuation in Part).
9. T. Pouyani and G.D. Prestwich, "Method for Making Functionalized Derivatives of Hyaluronic Acid," **U.S. Patent No. 5,652,347** (July 29, 1997).
10. D.M. Marecak and G.D. Prestwich, "Functionalized Derivatives of Hyaluronic Acid," **U.S. Patent No. 5,874,417** (February 23, 1999).
11. G.D. Prestwich and S. Ozaki, "Delivery of Phosphoinositide Phosphates into Cells," U.S. Provisional Application No. 60/102,482 filed September 30, 1998; Full filing August 20, 1999. Abandoned
12. G.D. Prestwich and W.G. Pitt, "Attachment of Hyaluronic Acid to Plasma-Etched Surfaces," U.S. Provisional Application No. 60/116,021 filed January 15, 1999; Full filing August, 1999. Abandoned
13. G.D. Prestwich, "Peptides That Mimic Hyaluronic Acid," U.S. Provisional Application No. 60/091,758 filed July 6, 1998; 09/347,707, Full filing July 3, 1999. Abandoned
14. G.D. Prestwich and F.S. Buckner, "Protist and Mycobacterium Steroid Compounds and Methods Related Thereto," U.S. Provisional Application No. 60/139,418 filed June 16, 1999, Full filing June 15, 2000. Abandoned
15. G.D. Prestwich, "Immobilized Reagents for Kinase Assays," U.S. Provisional Application No. 60/090,922 filed June 26, 1998; Full filing June 25, 1999. Abandoned
16. G.D. Prestwich, L. Feng, and H. Wojtasek, "Materials and Methods Useful to Affect Apoptosis," U.S. Provisional Application No. 60/151,032 filed August 27, 1999, PCT Filing WO 01/15722 A2, March 8, 2001. Abandoned
17. J.-w. Kuo, D.A. Swann, and G.D. Prestwich, "Water-Insoluble Derivatives of Hyaluronic Acid and Their Methods of Preparation and Use," **U.S. Patent No. 6,013,679** (January 11, 2000).

18. J.-w. Kuo, D.A. Swann, and G.D. Prestwich, "Method for Treating Wounds Using Modified Hyaluronic Acid Crosslinked with Biscarbodiimide," **U.S. Patent No. 6,096,727** (August 1, 2000).
19. G.D. Prestwich, Y. Luo, and K.R. Kirker, "Hydrogel Films and Methods of Making and Use Thereof," U.S. Provisional Application No. 60/218,725, Filed July 17, 2000; PCT Filing WO 02/06373 A1, January 24, 2002.
20. W.G. Pitt and G.D. Prestwich, "Attachment of Polysaccharides to Metallic Surfaces," U.S. Provisional Application, Filed April 23, 2001.
21. Y. Luo, G.D. Prestwich, J. Kopecek, and Z.-R. Lu, "Hyaluronic Acid Containing Bioconjugates: Targeted Delivery of Anti-Cancer Drugs to Cancer Cells," U.S. Provisional Application, U.S. Ser. No. 60/289,038, Filed May 2, 2001.
22. G.D. Prestwich, "Didehydrogeranylgeranyl ( $\Delta\Delta$ GG) and Related Materials and Methods," U.S. Provisional Patent Application, Filed June 7, 2001. Abandoned
23. G.D. Prestwich, "Compositions and Methods of Use of Derivatives of Phosphatidylethanolamine-Extended Phosphatidylinositol 4,5-Bisphosphate (Pea-PIP<sub>2</sub>)," U.S. Provisional Patent Application, Filed March 28, 2002; PCT filed March 26, 2003. Abandoned
24. L. Zhang and G.D. Prestwich, "Preblocking with non-HA GAGs Increases Effectiveness of HA Conjugated Anticancer Agents," U.S. Provisional Patent Application, Filed May 4, 2001; PCT filed May 6, 2002; Utility patent filed May 6, 2003.
25. G.D. Prestwich, P.W. Rzepecki, C.G. Ferguson, P.O. Neilsen, A.M. Branch, and L.R. Crosby, "Hybrid Phosphoinositide Phospholipids Compositions and Use," U.S. Provisional Patent Application, Filed June 28, 2002. Abandoned.
26. C.G. Ferguson and G.D. Prestwich, "Lipid Overlay Systems for Detecting Lipid Recognition Proteins and Methods of Use," U.S. Provisional Patent Application filed. Abandoned.
27. B.E. Drees, P.O. Neilsen, A. Branch, H.A. Hudson, L. Feng, and G.D. Prestwich, "Assaying Apparatus, Kit, and Method for Lipids and Associated Enzymes," **U.S. Patent No. 7,067,269** (June 27, 2006).
28. L. Feng and G.D. Prestwich, "Dye-Glutathione Conjugate as Universal Detector of GST-Fusion Proteins," U.S. Provisional Patent Application filed. Abandoned
29. G.D. Prestwich, Y. Xu, and L. Qian, "Analogues of Lysophosphatidic Acid and Methods of Making and Use Thereof," U.S. Provisional Patent Application filed April 9, 2003; PCT/US2004/11060 filed April 9, 2004 (WO 2004/092188 A3, October 28, 2004). Abandoned.
30. G.D. Prestwich, X.Z. Shu, Y. Luo, K. R. Kirker, and Y. Liu, "Crosslinked Compounds and Methods of Making and Using Thereof," **U.S. Patent 7,928,069 B2** (April 19, 2011).

31. G.D. Prestwich, X.Z. Shu, Y. Luo, K. R. Kirker, and Y. Liu, "Crosslinked Compounds and Methods of Making and Using Thereof," **EP 1,539,799** (December 11, 2013).
32. G.D. Prestwich, X.Z. Shu, Y. Luo, K. R. Kirker, and Y. Liu, "Crosslinked Compounds and Methods of Making and Using Thereof," **U.S. Patent 8,859,523** (October 14, 2014).
33. G.D. Prestwich, K.R. Kirker, S.D. Gray, X.Z. Shu, H. Li, and Y. Liu, "Anti-adhesion Composites and Methods of Use Thereof," U.S. Provisional Patent Application, May 7, 2003. PCT Int. Applic. WO 200500402 (2005). **U.S. Patent 8,324,184** (December 4, 2012).
34. Y. Luo and G.D. Prestwich, "Photocrosslinkers and Methods of Use Thereof," U.S. Provisional Patent Application filed May 30, 2003. US 2005/017660A1 (August 11, 2005). Abandoned.
35. J.-w. Kuo, D.A. Swann, and G.D. Prestwich, "Water-Insoluble Derivatives of Hyaluronic Acid Crosslinked with a Biscarbodiimide," **U.S. Patent No. 6,537,979** (March 25, 2003).
36. G. D. Prestwich, S. Cai, J. Beattie, M. J. Mostert, "Heparin binding proteins for heparin detection", US Patent application August 12, 2004; European Patent EP20040780840, Publication EP 1668359 (June 14, 2006). **Canada Patent CA 2,536,504 (March 3, 2005)**.
37. X.Z. Shu, Y. Liu, and G.D. Prestwich, "Modified Macromolecules and Methods of Making and Using Thereof," U.S. Provisional Patent Application Serial No. 60526797, filed December 4, 2003. PCT/US 2004/040726 filed December 5, 2004. Published as WO 2005/056608 on June 23, 2005. **U.S. Patent 7,981,871** (July 19, 2011).
38. C.G. Ferguson and G.D. Prestwich, "Compounds and Methods of Use Thereof for Assaying Lysophospholipase D Activity," **US Patent 7,459,285** (December 2, 2008.)
39. B.E. Drees, L. Chakravarty, G.D. Prestwich, G. Dormán, M. Kavecz, A. Lukacs, L. Urge, F. Darvas, P.W. Rzepecki, and C.G. Ferguson, "Compounds Having Inhibitory Activity Towards Phosphatidylinositol 3-Kinase and Methods of Use Thereof," PCT/US2004/018753, filed June 13, 2003; WO 2005/016245 A2, published February 24, 2005. Abandoned.
40. B.E. Drees, L. Chakravarty, G.D. Prestwich, G. Dormán, M. Kavecz, A. Lukacs, L. Urge, and F. Darvas, "Compounds Having Inhibitor Activity of Phosphatidylinositol 3-Kinase and Methods of Use Thereof," PCT/US 2004/019131; filed June 13, 2003; WO 2005/002514 A2, published January 13, 2005. Abandoned.
41. R.A.F. Clark and G.D. Prestwich, "Methods and Compositions for Wound Healing," US Patent Application 10/956,755; filed October 1, 2004; US 2005/0282747 A1, published December 22, 2005. Abandoned.
42. Glenn D. Prestwich, Guowei Jiang, Joanna Gajewiak, Honglu Zhang, and Gabor Tigyi, " $\alpha$ -Chloro and  $\alpha$ -Bromo Phosphonate Analogs of Lysophosphatidic Acid and Methods of Making and Using Thereof," **US Patent 8,722,649** (May 13, 2014)

43. Monica Serban and Glenn D. Prestwich, "Thiolated Macromolecules and Methods of Making and Using Thereof US Provisional Application No. 60/806,965 filed July 11, 2006; PCT and full filing July 10, 2007; WO 2008/008857 AZ published 17, January 2008. Abandoned.
44. Monica Serban and Glenn D. Prestwich, "Macromolecules Modified with Electrophilic Groups and Methods of Making and Using Thereof," US Provisional Application No. 60/806,966 filed July 11, 2006; PCT and full filing July 10, 2007; WO 2008/008859 AZ published 17, January 2008. Abandoned.
45. Glenn D. Prestwich, Jianxing Zhang, N. Rao, X. Xu, and Thomas Kennedy, "Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof," **U. S. Patent 8,399,430** (March 19, 2013).
46. Glenn D. Prestwich, Jianxing Zhang, Aleksander Skardal, "Fall-apart Composites and Methods of Use Thereof," US Provisional Patent Application filed May 5, 2008. (Abandoned 2009)
47. Natalya Y. Rapoport, Glenn D. Prestwich and Russell M. Condie, "Stable Perfluorocarbon Emulsions for use as an Artificial Oxygen Carrier," **U. S. Patent 8,673,984** (March 18, 2014).
48. Glenn D. Prestwich, Aleksander Skardal, Jianxing Zhang, "Hydrogels Crosslinked with Gold Nanoparticles and Methods of Making and Using Thereof," US Provisional Patent filed February 3, 2009; PCT filed February 2, 2010. Abandoned.
49. John Dobak and Glenn D. Prestwich, "Methods, Devices, and Compositions for Dermal Filling," US Patent Application 12/630,733 filed December 3, 2009. Abandoned.
50. Aleksander Skardal, Jianxing Zhang, and Glenn D. Prestwich, "Crosslinked Hydrogels and Methods of Making and Using Thereof", US Provisional Patent filed January 14, 2010. PCT filed January 13, 2011. Abandoned.
51. Glenn D. Prestwich and Thomas P. Kennedy, "Methods for treating or preventing the spread of cancer using semi-synthetic glycosaminoglycan ethers," US Provisional Patent filed January 26, 2010. PCT filed January 24, 2011. Abandoned.
52. Aleksander Skardal, Jianxing Zhang, and Glenn D. Prestwich, "TetraPEGs", US Provisional Patent filed April 21, 2010. Abandoned.
53. Glenn D. Prestwich, Siam Oottamasathien and Thomas P. Kennedy, "Applications of Partially and Fully Sulfated Hyaluronans," U.S. Provisional Patent application filed June 8, 2010. PCT filed June 8, 2011, now US 2013/0209531.
54. M. Mostert, G. D. Prestwich, B.E. Drees, P.O. Neilsen, L. Chakravarty, "Assaying Apparatus, Kit, and Method for Lipids and Associated Enzymes," **Canadian Patent No. 2,468,275** (May 25, 2010).
55. Glenn D. Prestwich, Jianxing Zhang, N. V. Rao, X. Xu, and Thomas Kennedy, "Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof," **U. S. Patent 7,855,187** (December 21, 2010).

56. Jerry C. Bommmmer, Chad Testa, and Glenn D. Prestwich, "The topical application of porphyrins for killing or preventing the growth of fungi or bacteria on a mammal," U. S. National Phase Patent Application (filed January 28, 2011; claims allowed Sept 26, 2013).
57. Siam Oottamasathien, Wanjian Jia, Glenn D. Prestwich, and Lindsy McCoard, "Methods for Treating Interstitial Cystitis", **U. S. Patent 8,343,942** (January 1, 2013).
58. C.G. Ferguson and G.D. Prestwich, "Compounds and Methods of Use Thereof for Assaying Lysophospholipase D Activity," **Canadian Patent 2,509,099**.
59. C.G. Ferguson, G.D. Prestwich, and D. Madan, "Compounds and Methods of Use Thereof for Assaying Lysophospholipase D Activity, Continuation-in-Part. **U. S. Patent 8,512,971** (August 20, 2013).
60. G.D. Prestwich, X.Z. Shu, and Y. Liu, "Modified Macromolecules and Methods of Synthesis and Use," U.S. Continuation-in-Part Patent application, July 15, 2011. **U. S. Patent 8,691,793** (April 8, 2014).
61. Glenn D. Prestwich, Jianxing Zhang, N. V. Rao, and Thomas Kennedy, "Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof," U. S. Patent Application (accelerated, ophthalmology) **U. S. Patent 8,329,673** (December 11, 2012).
62. G. D. Prestwich, L. Zang, X. Liu, Soluble metal sensor compounds and methods of making and using the same. US Provisional Patent Application (August 31, 2012). PCT filed August 30, 2013.
63. G. D. Prestwich, L. Zang, X. Liu, J. B. McCandless, Instrument-free detection of metal ions using metal sensor compositions. US Provisional Patent Application (August 31, 2012). Abandoned.
64. G. D. Prestwich, L. Zang, X. Liu, J. B. McCandless, Instrument-free detection of metal ions using soluble metal sensor compounds. US Provisional Patent Application (August 31, 2012). Abandoned.
65. G. D. Prestwich, L. Zang, X. Liu, J. B. McCandless, Field kit for metal ion detection and methods of using the same. US Provisional Patent Application (August 31, 2012). Abandoned.
66. L. Zang, G. D. Prestwich, and D. Bao, Portable Metal Ion Detector. US Patent Application (August 31, 2012). Abandoned.
67. D. Krizaj, G. D. Prestwich, P. Barabas, Y. Xu, and D. Ryskamp, Compounds with TRPV4 activity compositions and associate methods thereof (US Provision Patent Application, March 15, 2013; published US 2013/0303539 A1 November 14, 2013).
68. G. D. Prestwich, Deuterium-Enriched Hyaluronan, **U. S. Patent 9,187,576** (November 17, 2015).

69. J. Bommer, C. Testa, and G. D. Prestwich, Article, compositions and methods for killing or preventing the growth of microbes, **U. S. Patent 8,633,311** (January 21, 2014).
70. F. Marga, G. Forgacs, A. Forgacs, G.D. Prestwich. Edible microcarriers for engineered meat, U. S. Provisional Patent Application (September 13, 2013).
71. Glenn D. Prestwich, Jianxing Zhang , N. Rao, X. Xu, and Thomas Kennedy, “Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof,” **Australian Patent 2009231634** (August 24, 2014).
72. Glenn D. Prestwich, Thomas Kennedy, Jianxing Zhang, and N. V. Rao, “The Use of Alkylated Semi-synthetic Glycosaminoglycan Ethers for the Treatment of Dental Disorders,” **U. S. Patent 8,951,990** (February 10, 2015).
73. Glenn D. Prestwich, John E. Paderi, Julia Chen, and Rush L. Bartlett II, “Bioconjugates and Uses Thereof,” U. S. Patent Application 62/276,194 (April 15, 2016).
74. Glenn D. Prestwich, Jianxing Zhang , N. Rao, X. Xu, and Thomas Kennedy, “Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof,” **Korean Patent 10-1594552** (February 5, 2016).
75. Glenn D. Prestwich, Gabor Tigyi, Guangui Zhang, Guowei Jiang, Joanna Gajewiak, and Honglu Zhang, and, “ $\alpha$ -Chloro and  $\alpha$ -Bromo Phosphonate Analogs of Lysophosphatidic Acid and Methods of Making and Using Thereof,” **Canadian Patent 2,690,762** (June 14, 2016).
76. Glenn D. Prestwich, Jianxing Zhang , N. Rao, X. Xu, and Thomas Kennedy, “Alkylated Semi-synthetic Glycosaminoglycan Ethers, and Methods of Making and of Use Thereof,” **Canadian Patent 2,719,666** (August 16, 2016).
77. Glenn D. Prestwich, Siam Oottamasathien, Wanjian Jia, Lindsi McCoard, and Won Yong Lee, “Methods for Treating or Preventing Urological Inflammation”, **U. S. Patent 9,522,162** (December 20, 2016).
78. Glenn D. Prestwich, Siam Oottamasathien, Wanjian Jia, Lindsi McCoard, and Won Yong Lee, “Pharmaceutical Compositions Composed of Low Molecular Weight Sulfated Hyaluronan”, **U. S. Patent 10,226,481** (March 12, 2019).
79. Glenn D. Prestwich, Jianxing Zhang , Thomas P. Kennedy, and Narayanam Rao, “The Use of Alkylated Semi-synthetic Glycosaminoglycan Ethers for the Treatment of Inflammation,” **U. S. Patent 9,549,945** (January 24, 2017).
80. Glenn D. Prestwich, Abigail Pulsipher , Thomas P. Kennedy, and Jeremiah Alt, “Methods and Compositions for Treating Chronic Rhinosinusitis,” US Patent Application 62/573,903 (October 18, 2017)
81. John E. Paderi, Glenn D. Prestwich, Katherine A. Stuart, Harsha Kabra, Elvis Ikwa, “Bioconjugates with Chemically Modified Backbones”, App. 62530056 (July 7, 2017).
82. G. D. Prestwich, “Deuterium-Enriched Hyaluronan”, Continuation, **U. S. Patent 9,849,073** (December 26, 2017).

83. Glenn D. Prestwich, Siam Oottamasathien and Thomas P. Kennedy, "Applications of Partially and Fully Sulfated Hyaluronans," **Japanese Patent No. 6230909** (October 27, 2017).
84. Won Yong Lee, Thomas P. Kennedy, and Glenn D Prestwich, "Methods for Potentiating Cancer Treatment using Ionizing Radiation", US Patent application Ser. No. 62/760,134 (November 13, 2018).
85. Glenn D. Prestwich, Siam Oottamasathien, Wanjian Jia, Lindsy McCoard, and Won Yong Lee, "Methods for Treating or Preventing Urological Inflammation", **European Patent EP 2688402** (November 28, 2018).
86. Glenn D. Prestwich, Siam Oottamasathien and Thomas P. Kennedy, "Applications of Partially and Fully Sulfated Hyaluronans," **U. S. Patent 10,179,147** (January 15, 2019).
87. G. D. Prestwich, "Deuterium-Enriched Hyaluronan", Continuation, **Australian Patent 2014352672** (March 14, 2019).
88. Won Yon Lee, Abigail Pulsipher, Justin P. Savage, Thomas P. Kennedy, Glenn D. Prestwich, "Methods for Preventing a Serious Health Consequence and/or Tissue Damage After Exposure to Ionizing Radiation and/or Chemotherapy", **U. S. Patent 11,642,366** (May 9, 2023).
89. G. D. Prestwich, "Deuterium-Enriched Hyaluronan", Continuation 2, **U. S. Patent 10,398,636** (September 3, 2019).
90. Glenn D. Prestwich, Abigail Pulsipher , Thomas P. Kennedy, and Jeremiah Alt, "Methods and Compositions for Treating Chronic Rhinosinusitis," PCT US20/056419 (Published July 7, 2020 as US 16/610,936)
91. G. D. Prestwich, Deuterium-Enriched Hyaluronan, **Hong Kong Patent HK 1,227,907** (April 24, 2020).
92. G. D. Prestwich, Deuterium-Enriched Hyaluronan, **Israel Patent 245,741** (July 1, 2020).
93. B. Davis, A. Simpson, J. Agarwal, S. Wojtalewicz, J. Shea, H. Sant, B. Gale, G. D. Prestwich, Opioid independent surgical anesthetic, PCT No. TBA, Docket 6300.446.1a (September 12, 2020)
94. G. D. Prestwich, Deuterium-Enriched Hyaluronan, **EP 3074427 B1** (February 2, 2021).
95. A. Skardal, G. D. Prestwich, Novel Multi-Well 3D Organoid Plates and High Throughput Methods for Preparing the 3D Organoids, U. S. Provisional Application 63/201,717 (May 11, 2021).
96. G. D. Prestwich, Deuterium-Enriched Hyaluronan, **Canadian Patent CA 2,931,726** (March 15, 2022).



### **Membership and Offices Held**

American Chemical Society (1970-current)  
Entomological Society of America (1976-1992)  
International Union for Study of Social Insects (1975-1999)  
International Society of Chemical Ecology (lifetime member)  
American Association for the Advancement of Science (1975 – current)  
Sigma Xi (1977-current; President 1986-87, local chapter)  
American Associate of Colleges of Pharmacy (1998-current)  
Alternate Councilor, Division of Medicinal Chemistry, American Chemical Society (2002-2004)  
American Association for Cancer Research (2003-2019)  
Society for Biomaterials (2003 – current)  
International Society for Hyaluronan Sciences (founding VP Applied Research; 2004 – current)  
Tissue Engineering and Regenerative Medicine Society (2006 – current)

### **Supervisor for NIH Postdoctoral Fellows**

Dr. Mirza A. Mohamed, October 1986 - March 1989, 1F32 GM 1156501  
Dr. Gregory M. Anstead, February 1988 - August 1989, 1F32 HL 0761301

### **Mentor for Research and Clinical Faculty**

Research Assistant Professor Ikuro Abe, July 1996 - March 1998  
Research Assistant Professor Koen P. Vercruyse, June 1998 - July 2000  
Research Assistant Professor Yi Luo, June 2000 - December 2001  
Research Professor Shoichiro Ozaki, September 1997 - September 2002  
Research Associate Professor Jerald C. Hinshaw, July 1999 - June 2007  
Research Assistant Professor Yanchun Liu, September 2004 - June 2006  
Research Assistant Professor Xiao Zheng Shu, September 2004 - July 2006  
Research Assistant Professor Yong Xu, September 2004 - January 2006  
Research Assistant Professor Honglu Zhang, July 2007 - July 2008  
Assistant Professor of Surgery Siam Ootamasathien, January 2009 – current  
Assistant Professor of Surgery Jeremiah Alt, July 2013 - current

### **Host for Visiting Faculty Members and Scientists**

Professor John J. Brown (Entomology, Washington State University), 1982  
Professor Ryohei Yamaoka (Chemical Ecology, Kyoto Technical University, Japan), 1982-1983  
Professor Arnon Shani (Chemistry, Ben Gurion University, Israel), 1987-1988  
Professor James E. Carrel (Biology, University of Missouri, Columbia), 1990  
Professor Angel Guerrero (Department of Bioorganic Chemistry, CSIC, Barcelona, Spain), 1991  
Professor Shoichiro Ozaki (Department of Applied Chemistry, Ehime University, Japan), 1996  
Dr. David R. Greenwood (HortResearch, Mt. Albert Research Centre, Auckland, New Zealand), 1997  
Professor Alice Perez (Chemistry, University of Costa Rica), 1998  
Professor Matthew A. Movsesian (Cardiology, The University of Utah), 2000  
Dr. David R. Greenwood (HortResearch, Mt. Albert Research Centre, Auckland, New Zealand), 2000  
Professor Robert A. Peattie (Engineering, Trinity College, Hartford, Connecticut), 2001  
Professor Young Il Yang (Pathology, Paik-Inje Memorial Institute for Biomedical Science, Pusan, Korea), 2003  
Professor Jennifer Wilson (Institute for Glycomics, Griffith University, Gold Coast, Australia), 2005

**Reviewer of Manuscripts and Grants:** more than 50 journals including:

|                                |                          |                                    |
|--------------------------------|--------------------------|------------------------------------|
| <i>Biochemistry</i>            | <i>Eur. J. Biochem.</i>  | <i>Organic Lett.</i>               |
| <i>Biomacromolecules</i>       | <i>J. Biol. Chem.</i>    | <i>Proc. Natl. Acad. Sci., USA</i> |
| <i>Biomaterials</i>            | <i>J. Org. Chem.</i>     | <i>Science</i>                     |
| <i>Bioorg. Med Chem. Lett.</i> | <i>J. Am. Chem. Soc.</i> | <i>Tetrahedron Lett.</i>           |
| <i>Chem. &amp; Biol.</i>       | <i>Nature</i>            | <i>Tissue Engineering</i>          |
| <i>Chem. Senses</i>            | <i>Nature Biotech.</i>   |                                    |

Alfred P. Sloan Foundation  
National Institutes of Health  
National Science Foundation (8 programs)  
NIH Study Section, Bioorganic and  
Natural Products (ad hoc)  
NSERC (Canada)  
DOD Breast Cancer Review Panel

Petroleum Research Fund  
Research Corporation  
NIH Special Study Section (SBIRs) (1998 - 2002)  
Chair, Gordon Research Conference,  
Natural Products (1990)  
Chair, Gordon Research Conference,  
Bioorganic Chemistry (1995)

**Editorial and Advisory Boards**

*Journal of Chemical Ecology* (1984 - 1998)  
*Insect Biochemistry and Molecular Biology* (1985 - 1996)  
*Quarterly Review of Biology* (Book Review Consultant, 1986 -1996)  
*ChemTracts* (Organic Chemistry), Invited Expert Analyst (1989 - 2010)  
*Bioconjugate Chemistry* (1992 - 2010)  
*Current Opinion in Chemical Biology* (1997 - 2017)  
*Journal of Biological Chemistry* (2000 - 2006)  
*M.D. Anderson Cancer Center Advisory Board, University of Texas* (2001 - 2004)  
*Il Farmaco* Editorial Board (2001 - 2007)  
*Scientific Advisory Board, Aeterna Zentaris, Inc.* (2005 - 2007)  
*Current Bio Data Lipid Signalling* (2006 - 2010)  
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*Prostaglandins and Other Lipid Mediators* (2007 - 2015)  
*Macromolecular Biosciences* (2007 - 2017)  
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*Science Translational Medicine* (2011 – current)