

CURRICULUM VITAE

(January 20, 2011)

CHRIS M. IRELAND

**University of Utah
College of Pharmacy
Department of Medicinal Chemistry
Salt Lake City, Utah 84112
(801) 581-8305**

Birth date

November 22, 1951, San Diego, California, U.S. Citizen

Marital Status

Married, four children

Education

1973	B.A. University of California, San Diego
1977	Ph.D. Scripps Institution of Oceanography

Position

Professor of Department of Medicinal Chemistry and Dean

Professional Appointments

2010-	Dean, College of Pharmacy, University of Utah
2010-	L. S. Skaggs Presidential Endowed Chair for Pharmacy
2009-10	Interim Dean, College of Pharmacy, University of Utah
2002-09	Chair, Department of Medicinal Chemistry, University of Utah
2002	Visiting Scholar, Griffith University
1991-	Adjunct Professor, Department of Chemistry, University of Utah
1991-	Professor, Department of Medicinal Chemistry, College of Pharmacy, University of Utah
1986-91	Adjunct Associate Professor, Department of Chemistry, University of Utah

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| 1986-91 | Associate Professor, Department of Medicinal Chemistry, College of Pharmacy, University of Utah |
| 1983-86 | Adjunct Assistant Professor, Department of Chemistry, University of Utah |
| 1983-86 | Assistant Professor, Department of Medicinal Chemistry, College of Pharmacy, University of Utah |
| 1980-83 | Assistant Professor, School of Pharmacy, University of Connecticut |
| 1980 | Postdoctoral Fellow, University of Illinois |
| 1978-80 | NIH Postdoctoral Fellow, University of Hawaii |

Professional/Research Interests

Marine pharmacognosy, natural products chemistry, structure and mechanism of action of antitumor natural products, marine microbiology, drug discovery

Scientific/Professional Societies

American Chemical Society-Organic and Medicinal Chemistry Divisions
 American Society of Pharmacognosy
 American Association of Cancer Researchers

Honors and Distinctions

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| 2010- | L. S. Skaggs Presidential Endowed Chair for Pharmacy |
| 2009- | Fellow of the American Society of Pharmacognosy |
| 2008-11 | Honorary Research Fellow, Queensland Museum Biodiversity Program |
| 2008 | Short Term Fellow of the Japan Society for the Promotion of Science |
| 2007 | Top 5 percentile for NIH funding worldwide for the past two decades |
| 2007 | Utah Governor's Medal for Science and Technology |
| 2007 | Webster Sibilsky Award for Contributions to the Field of Medicinal Chemistry |
| 2007 | University of Utah, Distinguished Scholarly & Creative Research Award |
| 2006 | University of Utah, Distinguished Graduate Research Mentor Award |
| 2006 | College of Pharmacy, University of Utah, Distinguished Teaching Award |
| 1987-92 | National Institutes of Health Research Career Development Award |
| 1985-89 | Alfred P. Sloan Foundation Fellow |
| 1981 | University of Connecticut Summer Faculty Fellow |
| 1978-80 | National Institutes of Health Postdoctoral Fellow |

National Public Service Activities and Committee Memberships

2009- Trustee, Board of Trustees, Skaggs Institute for Research
 2009- Board of Directors, Utah Poison Control Center
 2009- Advisory Board, Utah Addiction Center
 2009- Board of Directors, University of Utah Center on Aging
 2008-13 National Cancer Institute-Board of Scientific Counselors
 2008 Nominating Committee, American Chemical Society, Division of Medicinal Chemistry
 2007 Organizer, NSF/JSPS-US-Japan Seminar in Marine Natural Products Chemistry
 2007 Ad Hoc reviewer for the NIDDK Board of Scientific Counselors
 2005-07 Chair, Conference Committee, American Society of Pharmacognosy
 2001-04 Chair, Honorary Membership Committee, American Society of Pharmacognosy
 1998 Chair, Research Achievement Award Committee, American Society of Pharmacognosy
 1993-96 Chair, Personnel Committee, American Society of Pharmacognosy
 1993 Chair, Scientific Organizing Committee & Member, Local Committee, Annual Meeting, American Society of Pharmacognosy
 1992 Chairman, Marine Natural Products Gordon Conference
 1991-92 President, American Society of Pharmacognosy
 1990 Co-Chairman, Marine Natural Products Gordon Conference
 1990-91 Vice-President, American Society of Pharmacognosy
 1989-93 Bio-organic and Natural Products study section-NIH, subsequently served ad-hoc on numerous study sections and site visit teams
 1988 Chairman & Host, Annual Meeting, American Society of Pharmacognosy
 1985-88 Chair, Awards and Funds Committee, American Society of Pharmacognosy

Journal Review Activities

Tetrahedron Letters
 Journal of the American Chemical Society
 Journal of Organic Chemistry
 Journal of Natural Products
 Tetrahedron
 Journal of Medicinal Chemistry
 Marine Drugs
 Organic Letters
 Anticancer Drugs
 Molecular Cancer Therapeutics

Editorial Board Membership

Journal of Natural Products	1999-present
Philippine Journal of Science	1999-present

Marine Drugs

2002-present

Consultant/Advisory Positions (past and *present*)

INI Health, Scientific Advisory Board
OSI Pharmaceuticals, Scientific Advisory Board
NPS Pharmaceuticals, Scientific Advisory Board
Ancile Pharmaceuticals, Scientific Advisory Board
Huntsman Cancer Institute, CCSG Internal Advisory Board
Eskitis Institute for Cell and Molecular Therapies, Griffith University, Queensland
Australia, Scientific Advisory Board

University Service Activities and Committee Memberships (past and present)

Combined Programs in Biological Chemistry and Molecular Biology, Executive Committee (University)
Incentive Seed Grants Program (University)
Biological Chemistry Program steering committee (University)
College of Pharmacy Executive Committee (College)
Co-Chair Self Study Committee for Professional Student Standards, 2001 ACPE Accreditation (College)
College of Pharmacy Curriculum Committee (College)
Computer Advisory Committee (College)
Instrument Room Committee (College)
Scholastic Standards Committee (College)
Awards and Funds Committee (College)
Chair of Search Committee for Chairperson of the Department of Pharmacology and Toxicology (College)
NMR Committee (Department)
Department Teaching Committee (Department)

Community Outreach Presentations

College of Pharmacy Ambassadors, University of Utah, January 2008
Health Science Center Advocates, University of Utah, April 2007
College of Pharmacy Student Leadership Summit, University of Utah, October 2006
Health Science Center Council, University of Utah, May 2006
ERDC, University of Utah, March 2005
Biotechnology Conference, Salt Lake Community College, March 2003

University Teaching/Advisory Committees

Courses Taught (*current teaching assignments*)

PHARM 410 Basics in Pharmaceutical Sciences

PHARM	411	Basics in Pharmaceutical Sciences
<i>PHARM</i>	<i>5113</i>	<i>Basics in Pharmaceutical Sciences</i>
MED CHEM	556	Physiological Chemistry
MED CHEM	561	Natural Products
<i>PHARM</i>	<i>7113</i>	<i>Basics in Pharmaceutical Sciences (Grad)</i>
MED CHEM	601	Instrumental Methods (Grad)
MED CHEM	789	Seminars (Grad)
MED CHEM	652	Natural Product(Grad)
MED CHEM	6990	Chemical Biology(Grad)

Research Faculty Supervised

Rohan Davis, Ph.D., Research Assistant Professor
 Timothy S. Bugni, Ph.D., Research Assistant Professor

Post Doctoral Fellows Supervised-Current Position

Deborah M. Roll, Ph.D.-Senior Scientist, Wyeth Ayerst Research
 Tadeusz F. Molinski, Ph.D.-Professor, Department of Chemistry, UC-San Diego
 Bradley S. Davidson, Ph.D.-Associate Professor, Department of Chemistry, Utah State University
 Robert R. West, Ph.D.-Senior Scientist, Zymogenetics
 Florecita De Guzman, Professor, Department of Chemistry, University of the Philippines
 Brent D. Copp, Ph.D.-Senior Lecturer, Department of Chemistry, University of Auckland
 Jodi A. Laakso, Ph.D.-Research Scientist, New Chemical Entities, Inc.
 Tommaso A. Foderaro, Ph.D.-Research Scientist, Ciba Gigy
 Todd L. Capson, Ph.D.-AAAS Science & Technology Policy Fellow
 Debra Venables, Ph.D.-Senior Project Officer, Queensland Government
 Cameron J. Smith, Ph.D.-Senior Scientist, Merck
 Deniz Tasdemir, Ph.D.- Lecturer, College of Pharmacy, University of London
 Rohan Davis, Ph.D. - Assistant Lecturer, Natural Products Division, Griffith University
 Damian Laird, Ph.D. - Research Associate, Murdoch University
 Camille Chevalier, Ph.D. - Position Unknown
 Anokha Ratnayake, Ph.D. - Senior Scientist, Wyeth
 Rachel Jadulco, Ph.D. - Associate Professor, School of Pharmacy, University of the Philippines
 Daniel LaBarbera, Ph.D. - Assistant Professor, Department of Pharmaceutical Sciences, University of Colorado
 Malcolm McCulloch, Ph.D. - Research Fellow, University of Prince Edward Island

Kaleem Mohammad, Ph.D. - Present
Xiaomei Wei, Ph.D. - Present
Zhenyu Lu, Ph.D. - Present

Students Graduated

Joseph E. Biskupiak, Ph.D., Associate Professor, Department of Pharmacotherapy, University of Utah
David F. Sesin, Ph.D. - Director of Chemistry, AgraQuest
T. Mark Zabriskie, Ph.D. - Professor, College of Pharmacy, Oregon State University
Tawnya C. McKee, Ph.D.- Staff Research Fellow, National Cancer Institute
Mark P. Foster, Ph.D. - Professor, Department of Biochemistry, Ohio State University
Leonard A. McDonald, Ph.D. - Research Scientist, Wyeth Ayerst Research
J. Christopher Swersey, M.S. - Owner, Little Cloud Adventures and Rafting
Annette M. Fernandez, Ph.D. - Pharmacoeconomics, Bristol Myers Squibb
Scott S. Mitchell, Ph.D. -Senior Scientist, Gilead Pharmaceuticals
Ryan VanWagoner, Ph.D. - Research Assistant Professor, Marine Sciences, UNC-Wilmington
Robyn James, M.S. - Research Associate, Burnham Institute of Medical Research
Adam Richardson, Ph.D. - Research Assistant Professor, Burnham Institute of Medical Research
Tim Bugni, Ph.D.- Assistant Professor, College of Pharmacy, University of Wisconsin
Sheryl Verbitski, Ph.D. - Senior Scientist, ChromaDex
Imelda Sandoval, Ph.D. - Research Associate, Huntsman Cancer Institute
Emily Whitson, Ph.D. - Postdoctoral Fellow, National Cancer Institute
Charles Veltri, Ph.D. -

Current Graduate Students

None

Visiting Scholars Supervised

Giselle Concepcion - Professor, Marine Sciences Institute, University of the Philippines
Brent Copp - -Senior Lecturer, Department of Chemistry, University of Auckland
Manah Dindi - Lecturer, School of Medicine, University of Papua New Guinea
Gina Mangalindan - Research Associate, Marine Science Institute, University of the Philippines
Teatulohi Matainaho - Professor, School of Medicine, University of Papua New Guinea

Jeffrey Noro - Lecturer, School of Medicine, University of Papua New Guinea
Funda Yalcin - Faculty of Pharmacy, Hacettepe University

Grant Awards History (current awards are in italics)

NIH Grant 1 R43 AI084610-01 “ Technology for isolation of Integrase Inhibitors for Therapeutics against Human Immunodeficiency Virus” SBIR with INTEGRATECH PROTEOMICS, INC., September 1, 2009 to August 31, 2011, \$145,000 (total direct costs)

NIH Grant R43AI078554-02 “ Methylerythritol Phosphate Pathway Project” SBIR with Echelon Biosciences, February 1, 2008 to January 31, 2010, \$97,969/year (direct costs)

NIH Grant CA36622-24-28 "Antineoplastic Agents From Marine Organisms" December 1, 2006 to November 31, 2011, \$1,250,000 (direct costs)

NIH Grant CA67786-11-15 “Anticancer Agents from Unique Natural Products Sources” September 26, 2005 to April 30, 2010, \$5,920,782 (total costs)

ICBG -Fogarty International Center Conservation and Sustainable Use of Biodiversity of Papua New Guinea (Chris M. Ireland and Louis R. Barrows, Co-PIs), \$3,500,000 total costs, 09/25/09 - 09/24/14.

ICBG -Fogarty International Center Conservation and Sustainable Use of Biodiversity of Papua New Guinea (Chris M. Ireland and Louis R. Barrows, Co-PIs), \$3,500,000 total costs, 09/25/03 - 05/31/09.

American Cancer Society RSG-02-141-01-CNE (David Jones, PI) Retinoid Biosynthesis in Colon Tumorigenesis 07/02/02 – 06/30/06

NIH Grant CA36622-19-24 "Antineoplastic Agents From Marine Organisms" June 1, 2001 to May 31, 2006, \$1,150,000 (direct costs)

Fogarty – FIRCA R03TW06008-01, HIV and TB Screening of PNG Marine Organisms 08/15/2002 – 07/31/2005, \$90,000 (total costs)

NIH Grant CA67786; “Anticancer Agents from Unique Natural Products Sources” September 8, 2000 to August 31, 2005, \$4,360,000 (total costs)

NIH Grant CA67786; “Anticancer Agents from Unique Natural Products Sources” September 8, 1995 to August 31, 2000, \$2,348,308 (total costs)

NIH Grant “Varian INOVA 600 MHZ NMR Spectrometer” April 1, 1999 to March 31, 2000, \$470,732 (total costs)

DOC, NOAA Grant NA36RG0036; "Metabolite Studies with Marine Microorganisms"
July 1, 1996 to June 30, 1999, \$310,000

California Sea Grant College Grant S145-N-N; "Technology for Discovery of Anti-Cancer Drugs from Marine Sources" October 1, 1995 to September 30, 1998, Co-Investigator, \$195,793 (total costs)

NIH Grant S10 RR06262; "500 MHZ NMR Spectrometer" July 18, 1991 to July 17, 1992
\$400,000 (total costs)

NIH Grant CA50750; "National Cooperative Natural Product Drug Discovery Group"
September 1, 1989 to June 30, 1994, Co-Investigator, total budget \$2,500,000

NIH Grant CA01179; RCDA April 1, 1987 to March 31, 1992, \$256,000 (direct costs)

NIH Grant 1 S15 CA46245-01; "Silicon Graphics Iris 3130 Work Station," September
30, 1987 to September 29, 1988, \$22,888

Alfred P. Sloan Foundation; September 16, 1985 to September 16, 1987, \$25,000

College of Pharmacy - BRSG; "Cultured Blue-Green Algae" Sept. 1, 1985 to August 30,
1986, \$3,500

University of Utah Research Committee; "Antiviral Agents from Marine Organisms"
November 1, 1983 to October 21, 1984, \$5,000

NIH Grant CA29821; "Antineoplastic Agents from Marine Organisms" May 1, 1982 to
August 31, 1983, \$86,449

UCRF Grant 35-420; "Marine Molluscs" September 1, 1980 to August 31, 1981, \$9,490

PRF Grant 12730-G4; "Photosynthetic Molluscs" September 1, 1980 to August 31, 1982,
\$10,000

Publications

1. Gomez, E.; Faulkner, D.J.; Newman, W.A.; Ireland, C. Juvenile Hormone Mimics: Effect on Cirriped Crustacean Metamorphosis *Science* (1973) *179*, 813-814.
2. Ramenofsky, M.; Faulkner, D.J.; Ireland, C. Effect of Juvenile Hormone on Cirriped Metamorphosis *Biochem. Biophys. Res. Comm.* (1974) *60*, 172-178.
3. Faulkner, D.J.; Stallard, M.O.; Ireland, C.M. Prepacifenol Epoxide, a Halogenated Sesquiterpene Diepoxide *Tetrahedron. Lett.* (1974) *40*, 3571-3574.

4. Ireland, C.; Faulkner, D.J.; Clardy, J.; Finer, J. A Novel Diterpene from *Dolabella californica* *J. Amer. Chem. Soc.* (1976) 98, 4664.
5. Ireland, C.M.; Stallard, M.O.; Faulkner, D.J. Some Chemical Constituents of the Digestive Gland of the Sea Hare *Aplysia californica* *J. Org. Chem.* (1976) 41, 2461-2465.
6. Ireland, C. and Faulkner, D.J. Diterpenes from *Dolabella californica* *J. Org. Chem.* (1977) 42, 3157.
7. Ireland, C.; Faulkner, D.J.; Solheim, B.A.; Clardy, J. Tridachione, a Propionate-Derived Metabolite of the Opisthobranch Mollusc *Tridachiella diomedea* *J. Amer. Chem. Soc.* (1978) 100, 1002.
8. Ireland, C. and Faulkner, D.J. The Defensive Secretion of the Opisthobranch Molluscs *Onchidella binneyi* *Bioorg. Chem.* (1978) 7, 125-131.
9. Ireland, C.; Faulkner, D.J.; Clardy, J.; Finer, J. Crispatone, a Metabolite of the Opisthobranch Mollusc *Tridachia crispata* *J. Amer. Chem. Soc.* (1979) 101, 1275.
10. Ireland, C. and Scheuer, P.J. Photosynthetic Marine Molluscs *Science* (1979) 205, 922.
11. Ireland, C. and Scheuer, P.J. Ulicyclamide and Ulithiacylamide, Two New Small Peptides from a Marine Tunicate *J. Amer. Chem. Soc.* (1980) 102, 5688-5691.
12. Ireland, C. and Faulkner, D.J. The Metabolites of the Marine Molluscs *Tridachiella diomedea* and *Tridachia crispata* *Tetrahedron*, (1981) 37, 233-240.
13. Ireland, C.M.; Durso, A.R., Jr.; Scheuer, P.J. N,N¹ dipenethylurea a Metabolite from the Marine Ascidian *Didemnum ternatanum* *J. Nat. Prod.* (1981) 44, 360-361.
14. Hochlowski, J.R.; Walker, R.P.; Ireland, C.M.; Faulkner, D.J. Metabolites of Four Nudibranchs of the Genus *Hypselodoris* *J. Org. Chem.* (1982) 47, 88-91.
15. Ireland, C.M.; Durso, A.R., Jr.; Newman, R.A.; Hacker, M.P. Antineoplastic Cyclic Peptides from the Marine Tunicate *Lissoclinum patella* *J. Org. Chem.* (1982) 47, 1807-1811.
16. Biskupiak, J.E. and Ireland, C.M. Pectinatone, a New Antibiotic from the Mollusc *Siphonaria pectinata* *Tetrahedron Lett.* (1983) 24, 3055-3058.
17. Biskupiak, J.E. and Ireland, C.M. The Stereochemistry of Thiazole Amino Acids in Peptides *J. Org. Chem.* (1983) 48, 2302-2304.
18. Wasylyk, J.M.; Biskupiak, J.E.; Costello, C.E.; Ireland, C.M. Cyclic Peptide Structures

- from the Tunicate *Lissoclinum patella* by FAB Mass Spectroscopy *J. Org. Chem.* (1983) 48, 4445-4449.
19. Sesin, D.F. and Ireland, C.M. Iodinated Tyramine Derivatives from Marine Tunicate *Tetrahedron Lett.* (1984) 25, 403-404.
 20. Ireland, C.M.; Biskupiak, J.E.; Hite, G.J.; Rapposch, M.; Scheuer, P.J.; Ruble, J.R. Iikonapyrone Esters, Likely Defense Allomones of the Mollusc *Onchidium verruculatum* *J. Org. Chem.* (1984) 49, 559-561.
 21. Biskupiak, J.E. and Ireland, C.M. Revised Absolute Configuration of Dysidenin and Isodysidenin *Tetrahedron Lett.* (1984) 25, 2935-2936.
 22. Hochlowski, J.E.; Coll, J.C.; Faulkner, D.J.; Biskupiak, J.E.; Ireland, C.M.; Qi-tai, Z.; Cun-heng, H.; Clardy, J. Novel Metabolites from Four *Siphonaria* Species *J. Amer. Chem. Soc.* (1984) 106, 6748-6750.
 23. Roll, D.M. and Ireland, C.M. Citorellamine, A New Bromoindole Derivative from *Polycitorella mariae* *Tetrahedron Lett.* (1985) 26, 4303-4306.
 24. Biskupiak, J.E. and Ireland, C.M. Cytotoxic Metabolites from the Mollusc *Peronia peronii* *Tetrahedron Lett.* (1985) 26, 4307-4310.
 25. Sesin, D.F.; Gaskel, S.; Ireland, C.M. The Chemistry of *Lissoclinum patella* *Bull. Soc. Chim. Belg.* (1986) 95, 853-867.
 26. Zabriskie, T.M.; Klocke, J.A.; Ireland, C.M.; Marcus, A.H.; Molinski, T.F.; Faulkner, D.J.; Xu, C.; Clardy, J. Jaspamide, A Modified Peptide from a *Jaspis* sponge, with Insecticidal and Antifungal Activity *J. Amer. Chem. Soc.* (1986) 108, 3123-3124.
 27. Roll, D.M.; Biskupiak, J.E.; Mayne, C.L.; Ireland, C.M. Muamvatin, A Novel Tricyclic Spiro Ketal from the Fijian Mollusc *Siphonaria normalis* *J. Amer. Chem. Soc.* (1986) 108, 6680-6682.
 28. Moriarity, R.M.; Roll, D.M.; Ku, Y.; Nelson, C.; Ireland, C.M. A Revised Structure for the Marine Bromo-Indole Derivative Citorellamine *Tetrahedron Lett.* (1987) 28, 749-752.
 29. McKee, T.C. and Ireland, C.M. Cytotoxic and Antimicrobial Alkaloids from a Fijian *Xestospongia caycedoi* *J. Nat. Prod.* (1987) 50, 754-756.
 30. Lindquist, N.; Fenical, W.; Sesin, D.F.; Ireland, C.M.; Van Duyne, G.D.; Forsyth, C.J.; Clardy, J. Isolation and Structure Determination of the Didemnenones, Novel Cytotoxic Metabolites from Tunicates *J. Amer. Chem. Soc.* (1988) 110, 1308-1309.

31. Molinski, T.F. and Ireland, C.M. Dysidazirine, a Cytotoxic Azacyclopropene from the Marine Sponge *Dysidea fragilis* *J. Org. Chem.* (1988) *53*, 2103.
32. Roll, D.M. and Ireland, C.M. Fascaplysin, an Unusual Antimicrobial Pigment from the Marine Sponge *Fascaplysinopsis* sp. *J. Org. Chem.* (1988) *53*, 3276.
33. Ireland, C.M.; Roll, D.M.; Molinski, T.F.; McKee, T.C.; Zabriskie, T.M.; Swersey, J.C. Uniqueness of the Marine Chemical Environment: Categories of Marine Natural Products from Invertebrates *Mem. Cal. Acad. Sci.* (1988) *13*, 41-57.
34. Zabriskie, T.M.; Mayne, C.L.; Ireland, C.M. Patellazole C: A Novel Cytotoxic Macrolide from *Lissoclinum patella* *J. Amer. Chem. Soc.* (1988) *110*, 7919-7920.
35. McKee, T.C.; Ireland, C.M. The Complete Spectral Assignment of Didemnin B and Nordidemnin B *Tetrahedron Lett.* (1989) *30*, 3053-56.
36. Charyulu, G.A.; McKee, T.C.; Ireland, C.M. Diplamine, A Cytotoxic Polyaromatic Alkaloid from the Tunicate *Diplosoma* sp. *Tetrahedron Lett.* (1989) *32*, 4201.
37. Zabriskie, T.M. and Ireland, C.M. The Isolation and Structure of Modified, Bioactive Nucleosides from *Jaspis johnstoni* *J. Nat. Prod.* (1989) *52*, 1353-1356.
38. Molinski, T.F.; Ireland, C.M. Varamines A and B, New Cytotoxic Thioalkaloids from *Lissoclinum vareau* *J. Org. Chem.* (1989) *54*, 4256-4259.
39. Zabriskie, T.M.; Foster, M.P.; Stout, T.; Clardy, J.; Ireland C.M. Studies on the Solution- and Solid-State Structure of Patellin 2 *J. Amer. Chem. Soc.* (1990), *112*, 8080-8084.
40. Davidson, B.S. and Ireland, C.M. Lissoclinolide, A Polyketide Lactone from *Lissoclinum patella*. *J. Nat. Prod.* (1990), *53*, 1036-1038.
41. West, R.R.; Ireland, C.M.; Mayne, C.L.; Brinen, L.S.; Clardy, J. Plakinidines: Cytotoxic Alkaloid Pigments from the Fijian Sponge *Plakortis* sp. *Tetrahedron Lett.* (1990) *31*, 3271-3274.
42. Davidson, B.S.; Molinski, T.F.; Barrows, L.R.; Ireland, C.M. Varacin, A Novel Antifungal Polysulfide from *Lissoclinum vareau* *J. Amer. Chem. Soc.* (1991) *113*, 4709-4710.
43. Copp, B.R. and Ireland, C.M. Wakayin: A Novel Cytotoxic Pyrroloiminoquinone Alkaloid from the Ascidian *Clavelina* Species *J. Org. Chem.* (1991) *56*, 4596-4597.
44. Swersey, C.J.; Barrows, L.R.; Ireland, C.M. Mamanuthaquinone: An Antimicrobial and Cytotoxic Metabolite of *Fasciospongia* sp. *Tetrahedron Lett.* (1991) *32*, 6687-6690.

45. McDonald, L.A.; Ireland, C.M. Patellamide E: A New Cyclic Peptide from the Ascidian *Lissoclinum patella* *J. Nat. Prod.* (1992) *55*, 376-379.
46. McDonald, L.A.; Phillips, D.R.; Ireland, C.M. Tawicyclamides A and B: New Cyclic Peptides from the Ascidian *Lissoclinum patella*: Studies on the Solution- and Solid-State Conformations *J. Org. Chem.* (1992) *57*, 4616-4624.
47. Dunkel, R.; Mayne, C.L.; Foster, M.P.; Ireland, C.M.; Du, L.; Owen, N.L.; Pugmire, R.J.; Grant D.M. Applications of the Improved Computerized Analysis of 2D-INADEQUATE Spectra *Anal. Chem.* (1992) *64*, 3150-3160.
48. Foster, M.P.; Mayne, C.L.; Dunkel, R.; Pugmire, R.J.; Grant, D.M.; Kornprobst, J.M.; Verbist, J.F.; Biard, J.F.; Ireland, C.M. The Revised Structure of Bistramide A (Bistratene A): Application of a New Program for the Automated Analysis of 2D INADEQUATE Spectra *J. Amer. Chem. Soc.* (1992) *114*, 1110-1110.
49. Copp, B.R.; Ireland, C.M.; Barrows, L.R. Psammaphysin C: A New Cytotoxic Dibromotyrosine-Derived Metabolite from the Marine Sponge *Druinella* (= *Psammaphysilla*) *purpurea* *J. Nat. Prod.* (1992) *55*, 822-823.
50. Foster, M.P.; Concepcion, G.P.; Caraan, G.B.; Ireland, C.M. Bistratamides C and D. Two New Oxazole-Containing Cyclic Hexapeptides Isolated from a Philippine *Lissoclinum bistratum* Ascidian *J. Org. Chem.* (1992) *57*, 6671-6675.
51. Radisky, D.C.; Radisky, E.S.; Barrows, L.R.; Copp, B.C.; Kramer, R.A.; Ireland, C.M. Novel Cytotoxic Topoisomerase II Inhibiting Pyrroloiminoquinones from Fijian Sponges of the Genus *Zyzya* *J. Amer. Chem. Soc.* (1993) *115*, 1632-1638.
52. Bernan, V.S.; Roll, D.M.; Ireland, C.M.; Greenstein, M.; Maiese, W.M.; Steinberg, D.A. A Study on the Mechanisms of Action of Sceptrin, an Antimicrobial Agent Isolated from the South Pacific Sponge *Agelas mauritiana* *J. Antimicrob. Chemo.* (1993) *32*, 539-550.
53. Barrows, L.R.; Radisky, D.C.; Copp, B.R.; Swaffar, D.S.; Kramer, R.A.; Warters, R.L.; Ireland, C.M. Makaluvamines, Marine Natural Products, are Active Anti-Cancer Agents and DNA TOPO II Inhibitors *Anti-Cancer Drug Design* (1993) *8*, 333-347.
54. McIntosh, J.M.; Foderaro, T.A.; Wenqin, L.; Ireland, C.M.; Olivera, B.M. Presence of Serotonin in the Venom of *Conus imperialis* *Toxicon* (1993) *31*, 1561-1566.
55. Foster, M.P. and Ireland, C.M. Nairaiamides A and B. Two Novel Di-Proline Heptapeptides Isolated from a Fijian *Lissoclinum bistratum* Ascidian *Tetrahedron Lett.* (1993) *34*, 2871-2874.
56. Swaffer, D.S.; Ireland, C.M.; Barrows, L.R. A Rapid Mechanism-Based Screen to Detect

Potential Anti-Cancer Agents *Anti-Cancer Drugs* (1994) 5, 15-23.

57. Trischman, J.A.; Tapiolas, D.M.; Jensen, P.R.; Dwight, R.; Fenical, W.; McKee, T.C.; Ireland, C.M.; Stout, T.J.; Clardy, J. Salinamides A and B: Anti-Inflammatory Depsipeptides from a Marine Streptomyces *J. Amer. Chem. Soc.* (1994) 116, 757-758.
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