

## CURRICULUM VITAE

**Dennis J. Paul, Ph.D.**

January 4, 2005

Department of Pharmacology and Experimental Therapeutics  
Louisiana State University Health Sciences Center  
1901 Perdido Street  
New Orleans, LA 70112

### EDUCATION:

B.A. (Cum Laude) University of Cincinnati, 1980

M.A. University of British Columbia, 1984: Pavlovian Conditioning and Tolerance to Analgesia Produced by Electrical Stimulation in the Brainstem. A. G. Phillips, Advisor

Ph.D. University of British Columbia, 1988: The Role of Type-2 Serotonin Receptors in Morphine Analgesia. J. P. J. Pinel, Advisor

### Academic Awards:

1984 Health Sciences Research Award (Pharmacology and Therapeutics)

### PROFESSIONAL EMPLOYMENT:

1984, Feb-July CIBA-GEIGY Pharmaceuticals, Basel, Switzerland, Praktikant (research trainee). Established intravenous self-administration laboratory; tested new behavioral screens for antidepressant drugs.

1987-90 Post-Doctoral Fellow, Cotzias Laboratory for Neuro-Oncology, Memorial Sloan-Kettering Cancer Center.

1990-1996 Assistant Professor, Department of Pharmacology, Louisiana State University Medical Center.

1996- Associate Professor, Department of Pharmacology, Louisiana State University Medical Center. **Appointments:** School of Medicine, School of Dentistry, School of Graduate Studies, Alcohol and Drug Abuse Center, Neuroscience Center of Excellence, Oral and Craniofacial Biology Center of Excellence.

2002 Adjunct Associate Professor, College of Engineering, University of New Orleans

### Other Appointments:

- 1994-2001 Co-Director, Mayo Clinics - LSU Medical Center Pain State CNS Tissue Bank.
- 1997-2002 Scientific Advisory Board, St. Charles Pharmaceuticals

### **GRANTS, FELLOWSHIPS AND CONTRACTS**

- 1988-90 Pharmaceutical Manufacturer Association Foundation Postdoctoral Fellowship in Pharmacology/Morphology. \$20,000/yr.
- 1991 Cancer Association of Greater New Orleans Research Grant: Autoradiographic Analysis of Opioid Receptor Subtypes in Cancer Pain Patients. \$7,000.
- 1991 NIH-BRSG: Effects of Kappa Opioid Receptor Subtype Stimulation on Phosphoinositide Hydrolysis. \$5,000.
- 1992 LSU Neuroscience Center Collaborative Grant: Central and/or Peripheral Opioid Receptor Regulation of Immunocompetence. Daniel J.J. Carr and Bryan M. Gebhardt, co-investigators. \$24,000.
- 1992-95 Louisiana Education Quality Support Fund: Kappa Opioid Receptors and Signal Transduction. \$139,409/3 yrs.
- 1992-93 Cancer Crusaders Grant: Quantitative Autoradiographic Analysis of Opioid Receptor Subtypes in Cancer Pain Patients. \$5,900.
- 1992-93 Mayo Foundation for Medical Education and Research: The Autoradiographic Characterization of Opiate Receptor Subtypes in Cancer Patients: Investigation of Lateralized Changes in Opiate Receptor Distribution. Consortium agreement with Dr. Gilbert Gonzales. \$45,444/2 yrs
- 1993 Subcontract from Dr. N. Bazan: Analgesic and Antipyretic effects of FB-0401. \$1,000.
- 1993-98 NIH-NIDA FIRST Award: Mechanisms Mediating Analgesic Effects of Drugs of Abuse. \$490,289/5 yrs.
- 1994-95 Neuroscience Center Grant: Analgesic and Antipyretic Effects of LAU0401-related compounds. \$3,500.
- 1995-96 Mayo Foundation for Medical Education and Research: Characterization of Opioid Receptors and Pain-related Neurotransmitters in Human Spinal Cord and Brain using Autoradiographic, Immunohistochemical and In Situ Hybridization: Investigation of Lateralized Changes in Opiate Receptor Distribution. Consortium agreement With Dr. Gilbert Gonzales (Mayo Clinics) and Drs. Richard Harlan and Merideth Garcia (Tulane University). \$55,000
- 1996-98 Mayo Foundation for Medical Education and Research: The Measurements of Nociceptin, Tyr-W-MIF-1 and Orphan Opioid Receptors: Comparison with Human Pain States and Controls. With Dr. Gilbert Gonzales (Mayo Clinics) and Drs. Richard Harlan, Merideth Garcia (Tulane University), and James Zadina (V.A. Medical Center). \$59,000.
- 2000 NIH-NINDS: Development of analgesics with fewer side effects. Subcontract to phase I SBIR to St. Charles Pharmaceuticals. \$100,000 total costs, \$33,000 to LSUHSC.
- 1999-03 NIH-NIDA: Development of Novel Nicotinic Receptor Mediated Therapeutic Agents. P.I.: Mark L. Trudell, Ph.D. (U. New Orleans), \$1,200,000. Consortium agreement to LSUHSC (D. Paul)

- 2002-04 Vaccarino, A., Paul, D., Rodrigues de Turco, E., Marcheselli, V., Sunkel, C., Alvarez-Builla, J., and Bazan, N. Synthesis, efficacy, and toxicity of N-[alpha-(1,2-benzisothiazol-3(2HO-ona-1,1-dioxide-2-yl)-acetyl]-p-aminophenol (SCP-1), a novel derivative of acetaminophen. *Submitted to J. Med Chem.*
- 2003 Novel drug combinations for treating pain in the elderly. Phase I SBIR to St. Charles Pharmaceuticals, NIH-NIA. PI: Anthony Vaccarino, Ph.D.

**Current:**

- 2000-05 LA Board of Regents: Molecular Craniofacial Biology, Mucosal Immunity and Infectious Disease. (Co-PI, 12 investigators). \$4,793,082.
- 2002-07 LA Board of Regents: Tulane-Xavier Center for Substance Abuse Research and Treatment. P.I.: Richard Harlan, Ph.D. (Tulane University Medical School). 2,866,570; D. Paul, Project PI, \$480,000.

**Current, Co-Investigator or Consultant:**

- 2004 Novel drug combinations for treating pain in the elderly. Phase II SBIR to St. Charles Pharmaceuticals, NIH-NIA. PI: Anthony Vaccarino, Ph.D.
- 2003-2005 NIH-NIA: Development of SCP-1 to treat chronic pain in the elderly. STTR Phase II Grant to St. Charles Pharmaceuticals. PI: Elena Rodriguez de Turco, Ph.D.

**PATENTS:**

Bazan, N., **Paul, D.**, Sunkel, C. and Alvarez-Builla, J. Synergistic combinations including N-acylated 4-hydroxyphenylamine derivatives. US Patent #**6,864,271**. Issued March 8, 2005.

**CURRENT COLLABORATORS:**

Harry J. Gould, M.D., Ph.D., Department of Neurology, LSUHSC  
Rhoda A. Reddix, Ph.D., Department of Pharmacology, LSUHSC  
Billie G. Jeansonne, DDS, PhD, Department of Endodontics, LSUSD  
Nicolas Bazan, M.D., Ph.D., Dept. of Ophthalmology and Neuroscience Center, LSUHSC, and St. Charles Pharmaceuticals  
Vicotor Marchiselli, Ph.D., Dept. of Ophthalmology and Neuroscience Center, LSUHSC  
Elena Rodriguez de Turco, Ph.D., Dept. of Ophthalmology and Neuroscience Center, LSUHSC and St. Charles Pharmaceuticals  
Julio Alvarez-Builla, Ph.D. Dept. of Chemistry, Universidad Alcalá, Spain  
Carlos Sunkel, Ph.D. Dept. of Chemistry, Universidad Alcalá, Spain  
Anthony Vaccarino, Ph.D., Dept. of Psychology, University of New Orleans  
Kenneth W. Narducy, MBA, PhD, President, St. Charles Pharmaceuticals  
Richard Harlan, Ph.D., Department of Anatomy and Director, Neuroscience Program, Tulane University Medical School.  
Meredith Mason Garcia, Ph.D., Department of Otolaryngology, Tulane University Medical School  
James Zadina, Ph.D., VA Hospital and Tulane University Medical School  
Karin N. Westlund-High, Ph.D., Department of Anatomy and Neuroscience, University of Texas Medical Branch, Galveston  
Johnny Porter, Ph.D. Department of Physiology, LSUHSC

Conrad Hornick, Ph.D., Dept. of Physiology, LSUHSC

## **EDITORIAL/REVIEWER**

### **Journals**

Journal of Pharmacology and Experimental Therapeutics  
Journal of Biological Chemistry  
Life Sciences  
Life Sciences: *Pharmacology Letters*  
Peptides  
American Journal of Physiology: Regulatory, Integrative and Comparative Physiology  
Neuropharmacology  
Analgesia  
Pain  
Proceedings of the National Academy of Sciences, USA

### **Grant Proposals**

City University of New York (*Ad Hoc*)  
LSU Neuroscience Center Starter Grants  
Veterans Administration (*Ad Hoc*)  
Medical Research Council of Israel (*Ad Hoc*)  
Greater New Orleans, Inc.  
Phillip Morris Foundation (*Ad Hoc*)

## **MEMBERSHIP IN PROFESSIONAL SOCIETIES**

International Association for the Study of Pain  
American Pain Society  
Society for Neuroscience  
Greater New Orleans Society for Neuroscience  
Treasurer, 1993-94  
Secretary, 2002-03  
International Narcotics Research Conference

## **TEACHING**

### **Professional Courses**

Medical Pharmacology  
Nursing Pharmacology (Course Co-Director, 1991-1994)  
Advanced Nursing Pharmacology  
Allied Health Pharmacology (Course Director, 1995-1996 )  
Pharmacology for Physical Therapists  
Dental Pharmacology (Course Co-director, 1999; Course Director, 2000-)  
Pharmacology for Dental Hygienists (Course Director, 2002-2003)

### **Graduate Courses**

Opioid Pharmacology (Course Co-Director) 1991  
Principles of Pharmacology

Neuropharmacology  
Scientific Presentations (Course Director)  
Pain Management (Course Co-Director)  
Seminar in General Dentistry  
Advanced Principles of Pharmacology (Course Co-Director)

## **COMMITTEES**

### **University:**

LSUHSC Committee to establish Interdisciplinary First Year Curriculum 2004-5  
LSUSD Faculty Development Committee:  
    Faculty Development Day Subcommittee (Chair) 1995  
    Faculty Retreat Subcommittee 1991-95  
    Spring Family Picnic Subcommittee 1995-1997  
    Ad Hoc Steering Committee 1995  
    Faculty Interpersonal Development Committee (Chair) 1995-97  
LSUSD Curriculum Oversight Committee 1999-2000  
LSUSD Curriculum Committee 2000-2004  
LSU Neuroscience Center Student Advisory Committee 1993-2002  
LSUMC Safety Committee 1997-present  
LSUSD Research Committee 1999-2002  
LSUSD Second Year Advancement Committee 1999-present  
LSUSD Faculty Assembly, elected 2003

### **Department:**

Graduate Student Recruitment 1994-95  
Graduate Student Liaison Committee 1994-2001  
Graduate Education Committee 2000-present  
Seminar Series Coordinator 1999-2004

### **Student Thesis/Dissertation Advisory:**

Eric Pakarinen, Ph.D.  
Naili Duan, Ph.D. (Advisor)  
John Mathis, Ph.D. (Biochemistry)  
H.H. Garza (Microbiology, Immunology and Parasitology)  
Kerra A. Gergen, Ph.D. (Neuroscience, Tulane University)  
Todd D. Ware MS (Advisor)  
Paul Frankel, Ph.D. (Neuroscience, Tulane University)  
Michelle K. Dixon, MS  
Ana Saenz, **MS**, DDS  
Toula Palaologou, **M.S.**, DDS  
Conrad Frey, **M.S.**, DDS  
Mark Parker Ph.D. (Neuroscience, LSUHSC)  
Douglas Webber, Ph.D. (Neuroscience, Tulane University)  
Eser Ercil, Ph.D.  
Priyadarshan Dabir, DDS, **MS**  
Garrett Morris, DDS, **MS** (Craniofacial Biology)

Adam Haberle Ph.D. (Neuroscience, LSUHSC)  
Michael Monroe Ph.D. (Neuroscience)  
Kayla Byrne, DDS, **MS** (Craniofacial Biology)  
Stephen Lee, **MS** (Pathology)  
Yuri Peterson, Ph.D.  
Hatice Ozsoy, Ph.D. (U. Houston, Pharmacology)  
Maria Sayah, Ph.D.

**Current:**

Anna Dunne (Advisor; Pharmacology)  
Kartic Rajput (Advisor; Pharmacology)  
Allison Intondi (Pharmacology, Tulane University)

**Undergraduate Students:**

Adele Fowler (Kalamazoo College)  
Candice Jones (Kalamazoo College)  
Nedrana Boute (Kalamazoo College)  
Duane Simeon (University of New Orleans)  
Vernon Freilot (University of New Orleans)  
Todd Ware (Kalamazoo College)  
Stephanie Gorman (Kalamazoo College)  
Trevor Gould (Vanderbilt University)  
B. Michelle McDonald (Northwestern Louisiana University)  
Jeremy Henriques (Northwestern Louisiana University)

**High School Students:**

Meredith Harper (MacGehee High School)

**Medical Students:**

Michael A. Gistrak (Cornell University School of Medicine)  
Jon A. Levison, J.A. (Chicago Medical School)  
Deborah H. Howard (Johns Hopkins School of Medicine)  
Anne Marie Johnson (LSU Medical Center)

**Postdoctoral Fellows:**

Mahmood Mosaddeghi, M.D., Ph.D.  
Denis Soignier, Ph.D. (co-advisor with Dr. Harry Gould)

## BIBLIOGRAPHY

1. **Paul, D.** and Phillips, A.G. (1986) Selective effects of pirenperone on analgesia produced by morphine or electrical stimulation at sites in the nucleus raphe magnus and periaqueductal gray. *Psychopharmacology* 88:172-176.
2. **Paul, D.**, Mana, M.J., Pfaus, J.G. and Pinel, J.P.J. (1988) Attenuation of morphine analgesia by the selective S<sub>2</sub> antagonists, pirenperone and ketanserin. *Pharmacol. Biochem. Behav.* 31:641-647.
3. **Paul, D.** and Pasternak, G.W. (1988) Differential blockade by naloxonazine of two mu opiate actions: analgesia and inhibition of gastrointestinal transit. *Eur. J. Pharmacol.* 149:403-404.
4. Jacobs, W.J., Blackburn, J.R., Buttrick, M., Harpur, T., Kennedy, D., Mana, M., MacDonald, M., McPherson, L., **Paul, D.** and Pfaus, J. (1988) Observations. *Psychobiology* 16:3-19.
5. **Paul, D.**, Standifer, K.M., Inturrisi, C.E. and Pasternak, G. W. (1989) Pharmacological characterization of morphine-6 $\beta$ -glucuronide, a very potent morphine metabolite. *J. Pharmacol. Exp. Ther.* 251:469-476.
6. Gistrak, M.A., **Paul, D.**, Hahn, E.F. and Pasternak, G.W. (1989) Pharmacological actions of a novel mixed opiate agonist/antagonist: naloxone benzoylhydrazone. *J. Pharmacol. Exp. Ther.* 251:469-476.
7. Bodnar, R.J., Pasternak, G.W., Mann, P.E., **Paul, D.**, Warren, R. and Donner, D.B. (1989) Mediation of anorexia by human, recombinant tumor necrosis factor through a peripheral action in the rat. *Cancer Reserach* 49:6280-6284.
8. Ling, G.S.F., **Paul, D.**, Simantov, R. and Pasternak, G.W. (1989) Differential development of tolerance to analgesia, respiratory depression, gastrointestinal transit and hormone release in a morphine infusion model. *Life Sciences* 45:1627-1636.
9. Kiefel, J.M., **Paul, D.** and Bodnar, R.J. (1989) Reduction in opioid and non-opioid forms of swim analgesia by 5-HT<sub>2</sub> receptor antagonists. *Brain Research* 500:231-240.
10. **Paul, D.**, Bodnar, R.J., Gistrak, M.A. and Pasternak, G.W. (1989) Different  $\mu$  receptor subtypes mediate spinal and supraspinal analgesia in mice. *Eur. J. Pharmacol.* 168:307-314.
11. Pinel, J.P.J., Kim, C.K., **Paul, D.** and Mana, M.J. (1989) Contingent tolerance and crosstolerance to anticonvulsant drug effects: pentobarbital and ethanol. *Psychobiology* 17:165-170.
12. Yoburn, B.C., **Paul, D.**, Azimuddin, S., Lutfy, K., and Sierra, V. (1989) Chronic opioid antagonist treatment increases  $\mu$  and  $\delta$  receptor mediated spinal opioid analgesia. *Brain Research* 485:176-178.
13. **Paul, D.** and Pinel, J.P.J. (1990) Pirenperone does not antagonize morphine analgesia in spinal

- rats. *Psychopharmacology* 100:98-101.
14. **Paul, D.** and Phillips, A. G. (1990) Associative factors in tolerance to analgesia produced by electrical stimulation in the brainstem. *Behavioral Neuroscience* 104:207-216.
  15. **Paul, D.**, Levison, J.A., Howard, D.H., Pick, C.G. Hahn, E.F. and Pasternak, G.W. (1990) Naloxone benzoylhydrazone (NalBzoH) analgesia. *J. Pharmacol. Exp. Ther.* 255: 769-774.
  16. Bodnar, R.J., **Paul, D.**, Liu, L., Rosenblum, M. and Pasternak, G.W. (1990) Blockade of morphine analgesia by both pertussis and cholera toxins in the periaqueductal gray and locus coeruleus. *Brain Res.* 529: 324-328.
  17. Bodnar, R.J., **Paul, D.**, and Pasternak, G.E. (1990) Proglumide selectively potentiates supraspinal  $\mu_1$  opioid analgesia in mice. *Neuropharmacology* 29: 507-510.
  18. Bodnar, R.J., **Paul, D.** and Pasternak, G.W. (1991) Synergistic analgesic interactions between the periaqueductal gray and the locus coeruleus. *Brain Res.* 558: 224-230.
  19. Kepler, K.L., Standifer, K.M., **Paul, D.** Kest, B., Pasternak, G.W. and Bodnar, R.J. (1991) Gender effects and central opioid analgesia. *Pain* 45: 87-94.
  20. Pick, C.G., **Paul, D.** and Pasternak, G.W. (1991) Comparison of naloxonazine and  $\beta$ -funaltrexamine antagonism of  $\mu_1$  and  $\mu_2$  opioid actions. *Life Sciences* 48: 2005-2011.
  21. **Paul, D.**, Pick, C.G., Tive, L.A. and Pasternak, G.W. (1991) Pharmacological characterization of nalorphine, a  $\kappa_3$  analgesic. *J. Pharmacol. Exp. Ther.* 257: 1-7.
  22. Roane, D.S. and **Paul, D.** (1991) Evidence of hyperglycemic hyperalgesia by Quinpirole. *Pharmacol. Biochem. Behav.* 41: 65-67.
  23. Pick, C.G., Cheng, J., **Paul, D.**, and Pasternak, G.W. (1991) Genetic influences in opioid analgesic sensitivity in mice. *Brain Res.* 566: 295-298.
  24. Pick, C.G., **Paul, D.** Eison, S.M. and Pasternak, G.W. (1992) Potentiation of opioid analgesia by the antidepressant nefazodone. *Eur. J. Pharmacol.* 211: 375-381.
  25. Tive, L.A., Pick, C.G., **Paul, D.**, Roques, B.P., Gacel, G.A. and Pasternak, G.W. (1992) Analgesic potency of TRIMU-5: a mixed  $\mu_2$  agonist/ $\mu_2$  antagonist. *Eur. J. Pharmacol.* 216: 249-255.
  26. Pick, C.G., **Paul, D.** and Pasternak, G.W. (1992) Nalbuphine: A mixed  $\kappa_1$  and  $\kappa_3$  analgesic in mice. *J. Pharmacol. Exper. Ther.* 262: 1044-1050.
  27. Carr, D.J.J., Gebhardt, BM and **Paul, D.** (1993)  $\alpha_2$  adrenergic and  $\mu_2$  opioid receptors are involved in morphine-induced suppression of splenocyte natural killer activity. *J Pharmacol Exp Ther*



28. **Paul, D.** and Hornby, P.J. (1995) Potentiation of intrathecal DAMGO antinociception, but not gastrointestinal transit inhibition, by 5-hydroxytryptamine and norepinephrine uptake blockade. *Life Science Pharmacology Letters* 56: PL 83-87.
29. **Paul, D.** and Tran, J.G. (1995) Differential cross-tolerance between analgesia produced by  $\alpha_2$ -adrenoceptor agonists and receptor subtype selective opioid treatments. *Eur. J. Pharmacol* 272: 111-114.
30. Mosaddeghi, M., Kapusta, D.R., Minor, L.D. Duan, N. and **Paul, D.** (1995) Role of kappa opioid receptor agonists on phosphoinositide hydrolysis in rat kidney. *Eur. J. Pharmacol. Mol. Pharmacol.* 289: 411-417.
31. Gonzales, G.R. and **Paul, D.** (1996) The effects of postmortem delay on opioid receptors in human spinal cord evaluated by quantitative autoradiography. *Analgesia* 2: 103-106.
32. Gergen, K.A., Zadina, J.E., Kastin, A.J. and **Paul, D.** (1996) Intrathecal Tyr-W-MIF-1 produces potent, naloxone-reversible analgesia modulated by  $\alpha_2$ -adrenoceptors. *Eur. J. Pharmacol.* 298: 235-239.
33. Zadina, J.E., **Paul, D.**, Gergen, K.A., Ge, L.-J., Hackler, L. and Kastin, A.J. (1996) Binding of Tyr-W-MIF-1 (Tyr-Pro-Trp-Gly-NH<sub>2</sub>) and related peptides to  $\mu_1$  and  $\mu_2$  opiate receptors. *Neurosci. Lett.* 215: 65-69.
34. Gergen, K.A., Zadina, J.E. and **Paul, D.** (1996) Analgesic effects of Tyr-W-MIF-1: A mixed  $\mu_2$ -opioid receptor agonist /  $\mu_1$ -opioid receptor antagonist. *Eur. J. Pharmacol.* 316: 33-38
35. **Paul, D.**, Fowler, A., Ware, T.D. and K.A. Gergen. (1997) Selective Norepinephrine and 5-hydroxytryptamine Transporter Blockade Effects on Analgesia Produced by Stimulation of Opioid Receptor Subtypes. *Analgesia* 3: 43-49.
36. **Paul, D.**, Gauthier, C.A., Minor, L.D. and Gonzales, G.R. (1997) The effects of postmortem delay on mu and kappa opioid receptor subtypes in rat brain and guinea pig cerebellum evaluated by radioligand receptor binding. *Life Sci.* **61**: 1993-1998.
37. Gonzales, G.R., Lewis, S.A., Weaver, A.L., and **Paul, D.** (1998) Tactile illusion-produced number perception in blind and sighted persons. *Mayo Clin. Proc.* **73**: 1167-1170.
38. Gould, H.J., III, Gould, T.N., **Paul, D.**, England, J.D., Liu, Z.P., Reeb, S.C. and Levinson, S.R. (1999) Development of inflammatory hypersensitivity and augmentation of sodium channels in rat dorsal root ganglia. *Brain Res.* **824**: 296-299.
39. Ware, T.D. and **Paul, D.** (2000) Cross-tolerance between analgesia produced by xylazine and selective opioid receptor subtype treatments. *Eur. J. Pharmacol.* **389**: 181-185.
40. Gould, H.J., III, Gould, T.N., England, J.D., **Paul, D.**, Liu, Z.P. and Levinson, S.R. (2000) A

possible role for nerve growth factor in the augmentation of sodium channels in models of chronic pain. *Brain Res.* **854**: 19-29.

- 41 **Paul, D.**, Yao, D., Zhou, P., Minor, L.D. and Garcia, M.M. (2001) 5-Hydroxytryptamine receptor subtypes involved in spinal 5-HT analgesia: An antisense approach. *J. Pharmacol. Exp. Ther.* **298**: 674-678.
- 42 Cheng, J., Zhang, C., Stevens, E.D., Izenwasser, S., Wade, D., Chen, S., **Paul, D.**, and Trudell, M.L. (2002) Synthesis and biological evaluation at nicotinic acetylcholine receptors of N-arylalkyl- and N-aryl-7-azabicyclo{2.2.1}heptanes. *J. Med. Chem.* **45**: 3041-3047.
- 43 Gould, H.J. III, Gould, T.N., Minor, L. and **Paul, D.** (2003) The effect of gabapentin on carrageenan-induced hyperalgesia in rat. *Analgesia* **6**: 513-521.
- 44 Gould, H.J. III, Soignier, R.D., Nolan, P., Minor, L.D., England, J.D. Levinson, S.R. and **Paul, D.** (2004) Ibuprofen blocks sodium channel augmentation induced by complete Freund's adjuvant. *J. Pain.* **5**:270-80.

#### **Submitted for publication:**

1. Morris, G.B., Jeansonne, B.G., **Paul, D.**, Levinson, S.R. and Gould, H.J. III. (In revision) Sodium channel augmentation in the trigeminal ganglion in response to inflammation of dental pulp, I: Mechanical injury vs complete freund's adjuvant injection. *Submitted to Brain Research.*
2. Morris, G.B., Jeansonne, B.G., **Paul, D.**, Levinson, S.R. and Gould, H.J. III. (in revision) Sodium Channel Augmentation in the Trigeminal Ganglion in Response to Inflammation of Dental Pulp II: Response in Immature and Mature Teeth. *Submitted to Brain Research.*
3. Soignier, R.D., P. Nolan, S. Vitale, D. Paul, and H.J. Gould, III (submitted) Assessment of stimulation parameters used in measuring mechanical hyperalgesia in animal models of pain. *J. Neurosci. Methods.*
4. Vaccarino, A., Paul, D., Rodrigues de Turco, E., Marcheselli, V., Sunkel, C., Alvarez-Builla, J., and Bazan, N. Synthesis, efficacy, and toxicity of N-[alpha-(1,2-benzisothiazol-3(2HO-ona-1,1-dioxide-2-yl)-acetyl]-p-aminophenol (SCP-1), a novel derivative of acetaminophen. *Submitted to J. Med Chem.*
5. Paul, D., Minor, L.D., Dunne, A. and Brodtkin, J. Three-dimensional isobolographic analysis of analgesia produced by stimulation of mu or delta opioid receptors, 5-HT3 receptors or alpha2 adrenoceptors. *Submitted to J. Pharmacol. Exper. Ther.*

#### **Edited Book Chapters:**

1. Baddley, J.W., **Paul, D.** and Carr, D.J.J. (1993) Acute morphine administration alters the expression of  $\beta$ -adrenergic receptors on splenic lymphocytes. In *Advances In Biosciences*, Vol.86. Pergamon Press.
2. **Paul, D.** and Pasternak, G.W. (1996) Opioids and the Control of Pain. In: *Neurotherapeutics: Emerging Strategies*. (L. Pullan and J. Patel, eds) Humana Press Inc, Totowa, NJ. pp 167-192.
3. Gould, H.J. III, England, J.D. and **Paul, D.**: The modulation of sodium channels during inflammation. In: *The Management of Acute and Chronic Pain: the Use of the "Tools of the Trade"*. Proceedings of the Worldwide Pain Conference, San Francisco, USA, July, 2000, (E. Krames and E Reig, eds) Monduzzi Editore, Balogna, Italy. pp 27-34.

### **Internet Reference Book Chapters**

1. Classical Models for Drug Receptor Interactions, Dennis Paul, xPharm (2004); Executive Editors: S.J. Enna and David B.Bylund; Publisher, Elsevier, Inc. New York.
2. Drug Receptor Interactions, Dennis Paul, xPharm (2004); Executive Editors: S.J. Enna and David B.Bylund; Publisher, Elsevier, Inc. New York.
3. Quantitative Parameters of Drug Action, Dennis Paul, xPharm (2004); Executive Editors: S.J. Enna and David B.Bylund; Publisher, Elsevier, Inc. New York.

### **Abstracts:**

1. Paul, D. & Phillips, A.G. (1983). Conditioned tolerance to analgesia produced by electrical stimulation of the periaqueductal gray in rats. Neuroscience Abstracts 9, 232.34.
2. Paul, D. & Pinel, J.P.J. (1986). Antagonism of morphine analgesia by ketanserin, a selective serotonin type-2 receptor antagonist. Canadian Psychology 27(2), 451.
3. Paul, D. & Pinel, J.P.J. (1987). Ketanserin does not block ketamine-produced analgesia. Canadian Psychology 28(2), 134.
4. Paul, D. & Pinel, J.P.J. (1987). The selective type-2 serotonin antagonist, LY53857, does not block morphine analgesia. Pain Suppl. 4, 80.
5. Paul, D. and Pasternak, G.W. (1988) Further evidence for mu opiate receptor subtypes: differential blockade by naloxonazine of morphine analgesia and inhibition of gastrointestinal transit. Neuroscience Abstracts 14: 18.15.
6. Gistrak, M.A., Paul, D., Hahn, E.F., and Pasternak, G.W. (1988) Pharmacological actions of a novel mixed agonist-antagonist opiate, NalBzoH. Neuroscience Abstracts 14: 18.12.
7. Kiefel, J.M., Paul, D. and Bodnar, R.J. (1988) Reduction in opioid and nonopioid forms of swim

- analgesia by serotonin type-2 receptor antagonists in rats. Neuroscience Abstracts 14: 134.3.
8. Pasternak, G.W., Paul, D. and Bodnar, R.J. (1988) Different mu opioid receptor subtypes mediate spinal and supraspinal analgesia. Neuroscience Abstracts 14: 191.3
  9. Paul, D., Huang, E. and Pasternak, G.W. (1989) Autoradiographic localization of kappa opioid binding sites with [<sup>3</sup>H]NalBzoH. Neuroscience Abstracts 15.
  10. Paul, D., Standifer, K.M., Inturrisi, C.E., Foley, K.M. and Pasternak, G.W. (1989) Pharmacology of Morphine-6-glucuronide, a potent morphine metabolite. Federation Proceedings.
  11. Paul, D., Pick, C.G., Tive, L.A. and Pasternak, G.W. (1990) Pharmacological characterization of nalorphine, a kappa<sub>3</sub> analgesic. Neuroscience Abstracts 16.
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40. Paul, D. Experimental Designs for the Study of Drug-Drug Interactions, Joint meeting of the American and Canadian Pain Societies, Vancouver, BC, May, 2004.
41. Soignier, R.D., Becker, A.M., Gould, H.J. III and Paul D., Asymmetric cross-tolerance between the endomorphines and opioid and non-opioid swim stress analgesia in mice. International Narcotics Research Conference, Kyoto Japan, July, 2004.

#### **Presentations at International Meetings:**

1. Paul, D. and Pinel, J.P.J.: Pirenpirone does not block morphine analgesia in spinally transected mice. Conference on Descending Inhibition of the Spinal Cord, Beaune, France, July, 1987.
2. Paul, D. and Pinel, J.P.J.: The selective type-2 serotonin antagonist, LY53857, does not block morphine analgesia. Vth World Congress on Pain, Hamburg, Germany, July, 1987.
3. Paul, D. and Pasternak, G.W.P.: Differential blockade by naloxonazine of two mu opiate actions: analgesia and inhibition of gastrointestinal transit. International Narcotics Research Conference, Albi, France, July, 1988.
4. Pasternak, G.W.P. and Paul, D.: Different  $\mu$  receptor subtypes mediate spinal and supraspinal analgesia in mice. Albi, France, July, 1988.
5. Paul, D., Bodnar, R.J., Liu, L., and Pasternak, G.W.P.: Blockade of intracerebral morphine analgesia by both pertussis and cholera toxin. International Narcotics Research Conference, Ste. Adele, Quebec, Canada, July, 1989.
6. Paul, D., Pick, C.G. and Pasternak, G.W.P.: Dissociation of kappa<sub>1</sub> and kappa<sub>3</sub> analgesia: Pharmacological characterization of naloxone benzoylhydrazine. International Narcotics Research

- Conference, Noordwijkerhout, The Netherlands, July, 1990.
7. Paul, D., Schmidhammer, H and Standifer, K.M.: Pharmacological characterization of cyprodime: a potent mu and kappa<sub>3</sub> opioid antagonist. International Narcotics Research Conference, Copper Mountain, CO, July, 1991.
  8. Paul, D.: Differential effects of monoamine uptake blockade on mu, kappa<sub>1</sub> and kappa<sub>3</sub> analgesia. International Narcotics Research Conference, Copper Mountain, CO, July, 1991.
  9. Paul, D. and Tran, J.: Differential cross-tolerance between α<sub>2</sub> adrenoceptor agonists and μ<sub>1</sub>, μ<sub>2</sub>, δ, κ<sub>1</sub>, and κ<sub>3</sub> opioid analgesia. International Narcotics Research Conference, Keystone, CO, June 1992.
  10. Paul, D., Fowler, A.R. and Tran, J.G.: Opioid Receptor subtype selective analgesia: Differential effects of NE uptake blockade and cross-tolerance with α<sub>2</sub> adrenoceptor agonists. VIIth World Congress on Pain, Paris, France, Aug, 1993.
  11. Paul, D. and Jones, C.: Dynorphin A: An agonist at kappa<sub>1</sub> and kappa<sub>3</sub> receptors. International Narcotics Research Conference, Skövde, Sweden, July, 1993.
  12. Paul, D. and Ware, T.D.: Pharmacological characterization of α-neoendorphin. International Narcotics Research Conference, North Falmouth, MA, July, 1994.
  13. Paul, D., Minor, L.D., and Stevens, C.W.: Opioid receptor binding in frog (*rana pipiens*) brain and spinal cord. International Narcotics Research Conference, St. Andrews, Scotland.
  14. Duan, N. and Paul, D.: Mechanisms of kappa<sub>1</sub> agonist inhibition of stimulated phosphoinositide hydrolysis in rat hippocampus. International Narcotics Research Conference, St. Andrews, UK.
  15. Paul, D.: Analgesic interaction of mu opioid, alpha-2 adrenoceptor and 5-HT receptor agonists: Three-dimensional isobolographic analysis. 26th International Narcotics Research Conference, Garmisch-Partenkirchen, Germany, July, 1998.
  16. Paul, D.: 3-Dimensional isobolographic analysis of intrathecal mu opioid, alpha-2 adrenoceptor and 5-HT receptor mediated analgesia. 28th International Narcotics Research Conference, Seattle, WA, July, 2000.
  17. Paul, D., Sayah, M. and Zadina, J.E.: Spinal analgesic synergy between the endomorphins and clonidine, but not the endomorphins and 2-methyl-5-HT. 29th International Narcotics Research Conference, Helsinki, Finland, July, 2001.
  18. Morris, G.J., Jeansonne, B.G., Paul, D., Levinson, S.R. and Gould, H.J. III: Sodium channel augmentation following tooth-pulp injury. 10th World Congress on Pain, San Diego, Aug. 2002.
  19. Paul, D., He, Z., Burmeister, M., Songu-Mize, E., Minor, L.D., and Gould, H.J. III: Upregulation of Na<sup>+</sup>, K<sup>+</sup>-ATPase in DRG after CFA-induced inflammation. 10th World Congress on Pain, San

Diego, CA, Aug. 2002.

20. Vaccarino, A.L., Rodrigueze de Turco, E.B., Marcheselli, V.L., Paul, D., Alvarez-Builla, J., Sunkel, C., Parkins, N., Scuderi, H.A. and Bazan, N.G.: SCP-1, a novel derivative of acetaminophen: Evaluation of analgesia, toxicity, lethality, and antipyresis. 10th World Congress on Pain, San Diego, CA, Aug. 2002.
21. Sayah, M., Paul, D., Dunne, A., Minor, L.D. and Zadina, J.E.: Modulation of spinal endomorphin analgesia by  $\alpha_2$  and 5-HT<sub>3</sub> receptor systems. 10th World Congress on Pain, San Diego, CA, Aug. 2002.
22. Dunne, A.L and Paul, D.: 3D isobolographic analysis of delta opioid, alpha-2 adrenoceptor and 5-HT<sub>3</sub> receptor mediated analgesia. International Narcotics Research Conference, Perpignon, France, July, 2003.
23. Cohen, R. Nolan, P. and Paul, D.: Isobolographic analysis of analgesia produced by morphine and clonidine or ketorolac in a model of inflammatory pain. International Narcotics Research Conference, Perpignon, France, July, 2003.

#### **Invited Lectures:**

1. 1989 Meeting of the International Society for Accupuncture and Electroanesthesia, New York, NY. "Opioid and Serotonin receptor subtypes and analgesia."
2. Reflex Sympathetic Dystrophy: Current Strategies in Diagnosis and Treatment. April, 1992, Philadelphia, PA. "Opiate Mechanisms of Pain Relief."
3. Greater New Orleans Society for Neuroscience Minisymposium: Opiates: From Biochemistry to Behavior. "Involvement of phosphoinositide hydrolysis in  $\kappa_1$  receptor signal transduction." New Orleans, 1993.
4. Department of Anesthesiology, University of California at San Diego, April, 1993. "Involvement of phosphoinositide hydrolysis in  $\kappa_1$  receptor signal transduction."
5. Department of Anatomy, Tulane University. May, 1993. "Kappa<sub>3</sub> Receptors: Pharmacology and Beyond."
6. Neuroscience Center of Excellence, LSU Medical Center, New Orleans. August, 1994. "Kappa opioid Receptors and Phosphoinositide Hydrolysis."
7. American Pain Society, Annual Meeting, Nov., 1994, Miami FL. "Kappa Receptor Subtypes: Implications for Pain Relief."
8. New Orleans Pain Interest Group, Feb., 1995. "Interaction of Antidepressant Drugs and Opioid Analgesia".



9. Department of Physiology, LSU Medical Center, New Orleans, May, 1996. "Opioid Analgesia: Interactions with Monoamine Systems Revisited."
10. Department of Psychology, University of New Orleans, February, 1997. "Opioid Analgesia: Interactions with Monoamine Systems Revisited"
11. New Orleans Pain Interest Group, May, 1998. "SCP-1: An acetaminophen-derived analgesic that is non-antipyretic and non-hepatotoxic."
12. Department of Pharmacology and Pharmaceutical Sciences, University of Houston, School of Pharmacy, November, 1998. "Opioid-Monoamine Interactions in the Production of Analgesia."
13. Hibernia Research Symposium, LSU School of Dentistry, May 1, 2001. "Three-dimensional Analysis of Analgesic Drug Combinations."
14. Department of Ophthalmology, LSU Health Sciences Center, New Orleans, February 8, 2002. "Three-dimensional Analysis of Analgesic Drug Combinations."
15. Hibernia Research Symposium, LSU School of Dentistry, May 10, 2002. "Inflammation, The Sodium Pump and Neuropathy."
16. Winter Conference on Brain Research, January, 2003. "Three-dimensional isobolographic analysis of analgesic drug combinations."
17. "This is Your Pain On Drugs". Symposium presented by the Greater New Orleans Society for Neuroscience, April, 2003. "Three-dimensional isobolographic analysis of analgesic drug combinations."
18. Experimental Designs for the Study of Drug-Drug Interactions, Joint meeting of the American and Canadian Pain Societies, Vancouver, BC, May, 2004.
19. "Inflammation, Sodium Channels, Sodium Pumps and Neuropathy." Department of Cell Biology and Anatomy, LSU Health Sciences Center, March 28, 2005.
20. "Lipid Rafts: A Novel Mechanism for Drug-Drug Interaction." Oral and Craniofacial Biology Center of Excellence, LSU Health Sciences Center, April 21, 2005.

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