

Craig William Clarkson, Ph.D.

Professor of Pharmacology

Director of Graduate Studies in Pharmacology

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URL: <https://medicine.tulane.edu/departments/pharmacology-simcenter/faculty/craig-w-clarkson-phd>

PERSONAL BACKGROUND:

- Born on September 22, 1955, Waupaca Wisconsin.

PROFESSIONAL AND ACADEMIC HISTORY:

- B.S.** in Biology and Chemistry 1977
Univ. of Puget Sound, Tacoma WA
- Ph.D.** in Pharmacology 1982
Northwestern Univ., Chicago, IL
- Postdoctoral Research Pharmacologist** 1982-1985
Dept. of Pharmacology,
Univ. of California., San Francisco, CA
- Assistant Professor** 1985-1990
Dept. of Pharmacology,
Tulane Univ., School of Medicine, New Orleans LA
- Associate Professor** 1990-1995
Dept. of Pharmacology
Tulane Univ., School of Medicine, New Orleans LA
- Professor** 1995-present
Dept. of Pharmacology
Tulane Univ., School of Medicine, New Orleans LA
- Director of Graduate Studies in Pharmacology** 2005-present
Dept. of Pharmacology, MS & PhD programs
Tulane Univ., School of Medicine, New Orleans LA

HONORS & AWARDS:

- Vice President, Phi Sigma** Biological Honorary Society 1976-1977
Univ of Puget Sound, Tacoma WA. (Undergraduate)
- Honors in Biology** 1977
Univ of Puget Sound, Tacoma WA.(Undergraduate)
- Graduate University Fellowship** 1977-1978
Northwestern Univ, Evanston IL.
- Research Career Development Award (NIH)** 1990-1995
"Mechanisms of Cocaine Cardiotoxicity"
- Owl Club Teaching Honor Roll** 1996-1997
Tulane Univ School of Medicine (Student Honor Society)
- Owl Club Teaching Award - Outstanding 2nd Year Teaching Award** 1997-1998
Tulane Univ School of Medicine (Student Honor Society)

Craig W. Clarkson, Ph.D.

- **Owl Club Second Year – Outstanding Professor, 2nd Semester**
Tulane Univ School of Medicine (Student Honor Society) 2000-2001
- **Owl Club Second Year – Student Advocate**
Tulane Univ School of Medicine (Student Honor Society) 2001-2002
- **Owl Club Second Year – Professor of the Year, Honorable Mention**
Tulane Univ School of Medicine (Student Honor Society) 2003-2004
- **Owl Club Second Year – Professor of the Year Teaching Award**
Tulane Univ School of Medicine (Student Honor Society) 2005-2006
- **Owl Club Second Year – Category 5 Teaching Award**
Tulane Univ School of Medicine (Student Honor Society) 2005-2006
- **Owl Club Second Year – Professor of the Year Teaching Award**
Tulane Univ School of Medicine (Student Honor Society) 2006-2007
- **Owl Club Second Year – Professor of the Year Teaching Award**
Tulane Univ School of Medicine (Student Honor Society) 2007-2008
- **Senior Vice President’s Teaching Scholar Award**
Tulane Univ School of Medicine 2007-2008
- **President’s Award for Excellence in Teaching**
Tulane University 2007-2008
- **Owl Club Second Year – Professor of the Year, Honorable Mention**
Tulane Univ School of Medicine (Student Honor Society) 2008-2009
- **Owl Club Second Year – Clifford Newman Student Advocacy Award**
for Members of the TmedWeb Team. Tulane Med School 2008-2009
- **Alpha Omega Alpha – Teacher of the Year Award**
Tulane University School of Medicine, Medical Honor Society 2008-2009
- **Owl Club Second Year – Professor of the Year Teaching Award**
Tulane Univ School of Medicine (Student Honor Society) 2010-2011
- **Gloria P Walsh Award for Teaching Excellence (Owl Club)** 2010-2011
- **Owl Club Second Year – Honorable Mention Best Professor**
Tulane Univ School of Medicine (Student Honor Society) 2011-2012
- **Owl Club –Humerus Award¹** 2012-2013
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club – Humerus Award** 2013-2014
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club – T2: Best PBL or TBL Facilitator Award** 2014-2015
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club Second Year – Professor of the Year Teaching Award** 2015-2016
Tulane Univ School of Medicine (Student Honor Society)
- **Fellow of the Academy of Pharmacology Educators** - induction. April 2017
American Society for Pharmacology and Experimental Therapeutics (ASPET); Division for Pharmacology Education.

¹ For having a good sense of humor. A real milestone on my CV.

Craig W. Clarkson, Ph.D.

- **Owl Club Leon A Weisberg Excellence in Clinical Teaching Award** 2016-2017
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T2 Teaching Excellence Award** 2016-2017
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T2 Best PBL or TBL Facilitator** 2016-2017
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T1 Module of the Year (Cardiovascular)** 2016-2017
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T1 Module of the Year (Cardiovascular)** 2018-2019
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T2 Course of the Year (Medical Pharmacology)²** 2018-2019
Tulane Univ School of Medicine (Student Honor Society)
- **Alpha Omega Alpha – Caring Teacher Award** 2020-2021
Tulane University School of Medicine, Medical Honor Society
- **Owl Club T2 Course of the Year (Medical Pharmacology)³** 2021-2022
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T2 Innovation Award** 2021-2022
Tulane Univ School of Medicine (Student Honor Society)
- **Owl Club T2 Best CBL/TBL Facilitator Award** 2021-2022
Tulane Univ School of Medicine (Student Honor Society)

GRANT FUNDING:

- **Biomedical Research Support Grant**, Craig W. Clarkson, P.I. Direct Costs: \$5,000. 1985-1986
- **American Heart Association, Louisiana Inc.**, Craig W. Clarkson, P.I. Direct Costs: \$13,491. "Action of Ischemic Metabolites on Cardiac Ion Channels". 1986-1987
- **American Heart Association (National)**, Craig W. Clarkson, P.I (awarded but declined by P.I.: this was an alternative proposal for a larger NIH grant: "Action of Antiarrhythmic Drugs on Cardiac I_{Na}".) 1987
- **NIH RO1 HL36096-01-03**, Craig W. Clarkson, P.I. 40% Effort. Direct Costs: \$92,514, \$40,000, \$42,872. "Action of Antiarrhythmic Drugs on Cardiac I_{Na}". 1987-1990
- **American Heart Association, Louisiana Inc.**, Arthur S. Pickoff P.I.. (Craig W. Clarkson, 10% Effort as Collaborating Investigator). Direct Costs: \$16,280. "Rate Dependent Antiarrhythmic Effects in the Newborn". 1991-1992
- **American Heart Association (National)**, Craig W. Clarkson, P.I. 30% effort. Direct Costs: \$40,000/yr. "Electropharmacodynamic Effects of Cocaine In Vivo". 1991-1994

² This is a "team award" vs an individual award. Many staff and faculty contributed to its favorable reception.

³ This is a "team award" vs an individual award. Many staff and faculty contributed to its favorable reception.

Craig W. Clarkson, Ph.D.

- **NIH 1 K04 HL02520, Research and Career Development Award.** Craig. W. Clarkson, P.I. Direct Costs: \$309,000, \$61,800/year (salary only). "Mechanisms of Cocaine Cardiotoxicity". 1990-1995
- **NIH 2RO1 HL36096-04-08,** Craig W. Clarkson, P.I. 40% Effort. Direct Costs: \$311,519/5 years. "Action of Antiarrhythmic Drugs on Cardiac I_{Na}". 1991-1996
- **American Heart Association, Louisiana Inc.,** Craig W. Clarkson P.I. (awarded but declined by P.I.: this was an alternative proposal for a larger NIH grant: "Developmental Changes in Human Cardiac Ion Channels ") 1996.
- **NIH RO1 HL36096-09-11,** Craig W. Clarkson, P.I. 25% Effort. "Developmental Changes in Human Cardiac Ion Channels ". Direct Costs: \$216,618 direct costs/3 years, 7/1/96-6/30/99.
- **American Heart Association, Southeast Affiliate, 9950914V** Craig W. Clarkson P.I.: "Expression Profiling of Human Cardiac Ionic Channels ") \$70,000 direct costs for 2 years, 1999-2001.
- **NIH RO1 HL64555-01-03,** Craig W. Clarkson, P.I. 40% Effort. "Molecular Basis for Drug Induced Cardiotoxicity in AIDS". \$624,874 direct costs for 3 years, 9/1/1999-8/31/2002.
- **NIH R01HL-63128-01A2,** Krishna C. Agrawal, P.I. Craig W. Clarkson, Co-Investigator 10% Effort. "Mechanisms of Cardiovascular Complications in AIDS". Direct Costs: \$196,542 direct costs for 1st year, 12/1/99-11/30/03

NOTE: Dr. Clarkson “retired” from basic science lab research (& writing research grants) in the aftermath of hurricane Katrina (2005), when he took over the responsibility of being the Director of Graduate Studies in Pharmacology (Department MS & PhD programs), and accepted an increasing number of Course Director responsibilities.

TEACHING:

EDUCATIONAL PROFESSIONAL MEMBERSHIPS:

- **International Association of Medical Science Educators (IAMSE)** 2003-present
- **Tulane University Society of Teaching Scholars, School of Medicine** 2008-present

VISITING PROFESSORSHIPS / DEPT REVIEWS:

- **American University of Antigua College of Medicine,** Dept. of Pharmacology, Antigua, Carribean. April 2005 & February 2006. Nine hours of lectures to medical students.
- **St. George’s University, School of Medicine.** External Review/Site Visit of the Dept. of Pharmacology & Medical School course. St. George’s Grenada April 5-8, 2009.

COURSE / MODULE DIRECTOR POSITIONS:

Current:

- **Medical Pharmacology** (2nd year medical course) 1997-present
- **Principles of Pharmacology** (Graduate) 2010-present
- **Pharmacology ePortfolio** (Graduate) 2011-present
- **Molecular & Cellular Pharmacology** (Graduate) 2012-present
- **Graduate Medical Pharmacology** (Graduate - MS & PhD students) 2018-present
- **Practicing Professionalism** (Graduate - MS & PhD students) 2019-present

Past:

- **Advanced Topics in Cardiovascular Pharmacology** (Graduate) 2000-2012
- **Systems Biology** (BMS Doctoral Program) 2007-2011
- **Concepts in Pharmacology** (Masters program) 2008-2009¹
- **Research Methods in Pharmacology** (Masters) 2010-2011
- **HEALX PhD to MD Program** (CV/Heme Module Codirector) 2013 & 2014
- **1st Year Medical Cardiovascular Module Director** 2016-2019

GRADUATE TEACHING:

- **Principles of Pharmacology**
 - Cardiac Physiology
 - The ECG/EKG
 - Cardiac Arrhythmias

MEDICAL & GRADUATE TEACHING:

- **Medical Physiology (1st year medical) Lectures & JiTT Sessions⁴**
 - Introduction to JiTT & Classroom Response Systems
 - Principles of Cardiac Excitation & Contraction
 - Cardiac Arrhythmias - *JiTT*
- **Medical Pharmacology (1st & 2nd year medical) – Lectures, Case-Based & JiTT Sessions**
 - Course Introduction
 - Pharmacokinetics (2 hrs)
 - Cholinolytic Drugs – *JiTT*
 - Eicosanoids
 - Histamine & Antihistamines
 - NSAIDs & Acetaminophen
 - Immunosuppressants
 - Treatment of Rheumatoid Arthritis & Gout
 - Herbal Supplements
 - Treatment of ED & BPH
 - Treatment of Hypertension
 - Hepatic Drug Clearance
 - Antiarrhythmic Drugs *JiTT*
 - Antianginal Drugs
 - Drugs used for the treatment of CHF *JiTT*
 - General & Local Anesthetics
 - Opioid Pharmacology
 - Adjunct drugs used in Anesthesiology
 - Anxiolytics & Sedatives

⁴ JiTT: Just in Time Teaching - An active learning strategy for teaching & learning.

Drugs of Abuse (Hallucinogens & Psychostimulants)
Effects of Age & Gender on Drug Responses

- **Medical Pharmacology (2nd year medical & Graduate) – Human Patient Simulation Exercises**
 - “*Mr. Boudreaux*” – Diagnosis & Treatment of Unstable Angina & Cardiac Arrhythmias
(an exercise developed in collaboration with Elma LeDoux, MD – Dir of Clinical Diagnosis)

Our 2nd year medical class is divided into ~12 “small groups” of 15-20 students for each Sim exercise

- **Medical Pharmacology (T2) – Module Reviews**
 - Basic Principles & Inflammation module
 - Introduction to Treatment of Infectious Diseases
 - ANS & CV module
 - Pulmonary module
 - Renal module
 - Neurology module
 - Human Behavior module
 - Endocrine & Toxicology Module
- **Medical Pharmacology (T2) – Case Based Learning**
 - Autonomic Pharmacology (2 hrs)
 - Treatment of Diabetes (w/ Dr. Galaghan) (2 hrs)
 - Oral Contraceptives (1 hr)

GRADUATE & POSTGRADUATE RESEARCH TRAINING

- **Thesis advisor** for William J Crumb 1988-1991
(Ph.D. thesis topic: Cellular mechanisms for cocaine cardiotoxicity). Defended Ph.D. thesis 8/91.
- **Research advisor** for You-Qiu Xu, MD/PhD 1988-1989; 1991-1992
(Dr. Xu was professor & chairman of the Dept. of Physiology, 2nd Medical School in Shanghai, China.)
- **Research advisor** for Wen Liu, MD 1990-1992
- **Postdoctoral Advisor** for William Crumb Jr., Ph.D. 1993-1994
- **Thesis advisor** for Neviana Nenova 1994-1998
(Ph.D. thesis: Pharmacology of Human Cardiac K Channels) Defended Ph.D. thesis 4/98.
- **Thesis advisor for Chad Carr** 1999-2000
(Master’s thesis: Effects of diabetes on cardiac ion channels)
- **Thesis advisor for Scott Stanat** 2000-2001
(Master’s thesis: Characterization of the inhibitory effects of Macrolide antibiotics on HERG potassium channels).

GRANT-REVIEW STUDY SECTIONS:

- NIH Ad Hoc Reviewer - AIDS & Related Research Study Section 1989
- Tulane University Cell and Molecular Biology Program Inst Grant Rev 1991

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- NIH Ad Hoc Reviewer for Program Project Grant at Vanderbilt University 1992
- NIH Ad Hoc Reviewer for Johns Hopkins SCOR application in Ischemic Heart Disease, Heart Failure & Sudden Death 1994
- NIH Ad Hoc Reviewer for Duke University SCOR application in Ischemic Heart Disease, Heart Failure & Sudden Death 1994
- American Heart Association, Louisiana Inc. Research Peer Review Committee 1994-1997
- American Heart Association, Southern Research Consortium, Peer Review. 1998-2001

EDITORIAL REVIEW:

- American Heart Association -Abstract Reviewer 1989-1992
- American Journal of Physiology 1990-2005
- Biophysical Journal 1990
- British Journal of Pharmacology 1997-1999
- Cardiovascular Research 1992-2005
- Circulation 1992-1994
- Circulation Research 1985-2005
- Journal of Clinical Investigation 1988-1995
- Journal of Molecular and Cellular Cardiology 1989-2005
- Journal of Pharmacol & Exp Therap 1991-2005

COMMITTEES:**University or Medical Center**

- Basic Research Support Grants 1986-1988, 1990
- Advisory Committee for Animal Resources 1987-1990
- Classroom Maintenance Committee 1987-1988
- Academic Computing 1988-1993
- Cardiobiology Task Force 1990-1991
- Surgery Required Clerkship Review Committee 1991-1993
- Senate Committee on Physical Facilities 1994-1997
- Chairman, Nominating Comm for General Med Faculty 1996-1997
- Chairman, General Medical Faculty 1997-1998; 2007-08
- Planning Comm for Tulane Natl Cntr for CV Health 1995
- Cardiobiology Coordinating Committee 1991-1995
- Admissions Committee 1994-1999
- Executive Faculty 1997-1999
- Senate Committee on Honors 1997-1999
- Graduate Council 1997-2000
- University Senate Committee on Computing 1998-2001
- Curriculum Committee 1999-2022
- Faculty Advisory Committee 1990-93, 1995-99, 2000-03
- Faculty Advisory Committee 2005-2007
- Evaluation Committee (inactive since Katrina) 2004-2005
- Tulane's delegate to the US Pharmacopeia Convention 2005
- 2nd Year Clinical Curriculum Advisory Committee 1997-present
- Professionalism & Promotion (Student Affairs) 2004-present
- Admissions Committee 2005-2013
- Chairman, Nominating Comm for General Med Faculty 2006-2007
- Personnel & Honors Committee 2006-2009
- Educational Technology Committee (chair) 2007- 2011
- Faculty Advisory Committee (chair) 2007-2008
- Grievance Committee 2007-2008

Craig W. Clarkson, Ph.D.

- Simulation Center Curriculum Committee 2008-2017
- Committee on Educational Policy (Senate subcomm) 2009-2017
- Simulation Center Research Committee 2010-2017

Doctoral Thesis Committees

- William Crumb Jr. (Pharmacology) 1988-1991 (Ph.D. thesis advisor)
- Nick Ferencz (Pharmacology) 1988-1991
- Jeff McGee (Physiology) 1989-1992
- Chu Chen (Physiology) 1991-1993
- Owen Wilson (Physiology) 1992-1994
- Conrad Mallia (Pharmacology) 1991-1995
- Etoi Garrison (Pharmacology) 1994-1995
- Victor Ruiz (Physiology) 1992-1995
- Jose Santiago (Pharmacology) 1992-1995
- Ingrid Ehrlich (Physiology) 1994-1996
- Alan Kaye (Pharmacology) 1991-1997
- David Lambert (Pharmacology) 1996-1998
- Neviana Nenova (Pharmacology) 1994-1998 (Ph.D. thesis advisor)
- Walter Robertson (Physiology) 1994-2000
- Christopher Holt (Pharmacology) 1996-2000
- Hunter Champion (Pharmacology) 1996-1999
- Anna Kadish (Pharmacology) 1998-1999
- Adam Hendricson (Pharmacology) 1999-2001
- Hoya Lang (Physiology) 1999-2001
- Juan Guo (Physiology) 2000-2001
- Christopher Williams (Pharmacology) 1999-2004
- Leena Pradhan (Pharmacology) 2001-2004
- Trinity Bivalacqua (Pharmacology) 2002-2004
- James T. Taylor (Pharmacology) 2002-2005
- Brian Keyser (Pharmacology) 2002-2005
- John Liles (Pharmacology) 2002-2005
- Anthony (Joel) Greco (MCB) 2004-2008
- Allison Intondi (Pharmacology) 2005-2008
- David Casey (Pharmacology) 2006-2010
- James Antoon (Pharmacology) 2007-2010
- Daniel Petroni (Pharmacology) 2007-2010
- Jonathan Pottle (Physiology) 2009-2011
- Shijia Zhang (Pharmacology) 2010-2013
- Edward Pankey MD (Pharmacology) 2009-2013

SCIENTIFIC MEMBERSHIPS:

- American Society for Pharmacology and Experimental Therapeutics (ASPET)
- International Association of Medical Science Educators (IAMSE)

SEMINARS PRESENTED (1991-present):

Departmental Seminars:

- *Evidence for developmental changes in the cardiac Na current and channel block by lidocaine and phenytoin.* Cardiology Dept., Northwestern Univ. Sch of Medicine 1991
- *Electropharmacodynamic effects of cocaine.* Cardiology Dept., Northwestern Univ. Sch of Medicine 1991
- *Electropharmacodynamic effects of cocaine on the in vivo canine heart.* Cardiovascular & Hypertension Research Conference, Tulane Univ Sch of Medicine 1991
- *Electrophysiological effects of cocaine on the heart in vitro and in vivo.* LSU School of Medicine (LSU-Tulane Joint Pharmacology Seminar) 1992
- *Electrophysiologic and arrhythmogenic actions of cocaine.* Cardiovascular & Hypertension Research Conference, Tulane Univ Sch of Medicine 1993
- *Developmental Changes in Cardiac Ion Channels.* Physiology Dept., Tulane Univ Sch of Medicine 1994
- *Cardiac Ion Channels.* Molecular & Cellular Biology Program Tulane Univ School of Medicine 1996
- *Effects of Cocaine on Cardiac Ion Channels, a Cellular Basis for Cardiotoxicity.* Dept. of Medicine, Section of Cardiology Tulane Univ School of Medicine 2001

Research Symposia Lectures:

- *Cellular Mechanisms of Antiarrhythmic Drug Action .* Symposium on Future Directions for Antiarrhythmic Drug Use and Development. American Society for Clinical Pharmacology and Therapeutics. San Francisco, CA 1990
- *Evidence for developmental changes in the transient outward current in human atrial myocytes.* Symposium on Ionic Channels. Third Congress of Federation of Asian and Oceanian Physiological Societies, Shanghai China 1994
- *Developmental Changes in the Expression and Pharmacology of I_{to} in Human Atrium.* Symposium on Electrical Responses and Pharmacology of Mammalian A-V Node and Atrium , Banff, Canada 1996

Educational Presentations & Workshops:

- *The Doctoral Program in Pharmacology at Tulane University – Post Katrina* Meeting of the National Directors of Graduate Studies in Pharmacology (Salt Lake City, Utah, July 25-28th) 2007
- *Integrating Web 2.0 Technologies into the Curriculum* Clarkson CW, Samuel J, Daniel A. 2008
Medical Education Workshop presented April 5, 2008
Southern Group on Education Affairs (SGEA), Vanderbilt University.

- *A Team Approach to Implementing Team-based Learning: Lessons Learned* 2009
Daniel A, Crawford B, Krane K, Kahn M, Clarkson C, Dise T, Klingsberg R
Small group discussion. April 3, 2009. Abstract #228
Southern Group on Education Affairs (SGEA), New Orleans
- *Active Learning & Learner-Centered Instruction. Changing the Emphasis from Teaching to Learning.* 2009
National Directors of Graduate Studies, April 23, 2009.
New Orleans. Symposia talk & afternoon small group sessions.
- *Active Learning.* Alpha Omega Alpha Medical Honor Society (Banquet Talk). 2009
Commanders Palace, New Orleans. April 22, 2009
- *An Educational Experiment with JiTT & Peer Instruction: Pre-test /Post-test Pitfalls.* 2009
OME Education Research Seminar. Jan 26, 2009
- *Just-in-Time-Teaching & Peer Instruction.* 2009
Board of Governors - Tulane Medical School, May 11, 2009.
- *Just-in-Time-Teaching, Classroom Response Systems & Human Patient Simulation – Changing the Emphasis from Teaching to Learning.*
Annual Meeting of the Group for Research in Pathology Education (GRYPE)
Jan 15, 2010, New Orleans, LA. 2010
- *Using Human Patient Simulators to Enhance Basic Science Education Throughout the Undergraduate Medical Curriculum – (IAMSE Faculty Development Course)*
Susan Pasquale, John L Szarek, Craig Clarkson & Elma LeDoux. International
Association of Medical Science Educators
IAMSE Meeting New Orleans, LA July 10, 2010 2010
- *Just-in Time Teaching & Peer Instruction in Medical Education – (IAMSE Faculty Development Course)* Craig Clarkson & David Franklin. International
Association of Medical Science Educators
IAMSE Meeting Portland, OR, June 2012 2012
- *Wikis & Interactive Quizzes – Technology Our Students Really Use to Learn.*
Tulane SOM Educational Technology Retreat, May 1, 2012. 2012
- *Just-in Time Teaching* 2018
Dept of Structural & Cellular Biology March 21
- *Using Technology to Support Active & “Self-Directed” Learning in the Medical Curriculum* Tulane Center for Engaged Learning & Teaching (CELT)
“Sparking Success. A Faculty Development Conference”. January 11, 2019 2019
- *“Flipping without Flopping”: Developing engaging digital resources for millennial and Gen Z learners.* Clarkson C & Gorman L. 2019 IAMSE Meeting,
June 10, 2019. Roanoke, Virginia. 2019

PUBLICATIONS:

Manuscripts

1. **Clarkson CW**, Ten Eick RE: On the mechanism of lysophosphatidylcholine induced depolarization of cat ventricular myocardium. *Circ Res* 52:557-565, 1983
2. **Clarkson CW**, Matsubara T, Hondeghem LM: Slow inactivation of Vmax in guinea pig ventricular myocardium. *Amer J Physiol* 247:H645-H654, 1984
3. **Clarkson CW**, Hondeghem LM: Electrophysiological evidence that local anesthetics and antiarrhythmic drugs bind to a specific receptor site in cardiac sodium channels: displacement of bupivacaine by lidocaine. *Proc West Pharm Soc* 27:23-25, 1984
4. **Clarkson CW**, Hondeghem LM: Mechanism for bupivacaine depression of cardiac conduction: Fast block of sodium channels during the action potential and slow diastolic recovery. *Anesthesiology* 62:396-405,1985
5. Hondeghem LM, **Clarkson CW**, Matsubara T: Is tetrodotoxin block of cardiac sodium channels voltage-dependent? *Proc West Pharm Soc* 28: 9-10,1985
6. **Clarkson CW**, Hondeghem LM: Evidence for a specific receptor site for lidocaine, quinidine and bupivacaine associated with cardiac sodium channels in guinea pig ventricular myocardium. *Circ Res* 56:496-506,1985
7. Matsubara T, **Clarkson CW**, Hondeghem LM: Lidocaine blocks open and inactivated cardiac sodium channels. *Naunyn Schmiedeberg's Arch Pharmacol.* 336:224-231,1987
8. **Clarkson CW**, Follmer CF, Ten Eick RE, Hondeghem LM, Yeh JZ: Evidence for two components of sodium channel block by lidocaine in isolated cardiac myocytes. *Circ Res* 63:869-878,1988
9. **Clarkson CW**, Matsubara T, Hondeghem LM: Evidence for voltage dependent block of cardiac sodium channels by tetrodotoxin. *J Mol Cell Cardiol* 20:1119-1131;1988
10. **Clarkson CW**: Stereoselective block of cardiac sodium channels by RAC109 in single guinea pig ventricular myocytes. *Circ Res* 65:1306-1323;1989
11. Crumb WJ, **Clarkson CW**: Characterization of cocaine-induced block of cardiac sodium channels. *Biophys J* 57:589-599;1990
12. Crumb WJ Jr, Kadowitz PJ, Xu Y-Q, **Clarkson CW**. Electrocardiographic evidence for cocaine cardiotoxicity in cat. *Can J Physiol Pharmacol* 68:622-625,1990.
13. **Clarkson CW**: Modification of sodium channel inactivation by a-chymotrypsin in single cardiac myocytes. *Pflügers Archiv* 417:48-57,1990.
14. Xu Y-Q, Pickoff AS, **Clarkson CW**: Evidence for developmental changes in sodium channel inactivation gating and sodium channel block by phenytoin in rat cardiac myocytes. *Circ Res* 69:644-656,1991.
15. Dise T, Stolfi A, **Clarkson C**, Pickoff AS: The rate-dependent effects of lidocaine on His-Purkinje conduction in the intact neonatal heart - characterization and amplification by N-acetylprocainamide. *J Pharmacol Exp Therap* 259:535-542, 1991.

16. Crumb WJ Jr, **Clarkson CW**: Characterization of the sodium channel blocking properties of the major metabolites of cocaine in single cardiac myocytes. *J Pharmacol Exp Therap* 261:910-917,1992.
17. Xu Y-Q, Pickoff AS, **Clarkson CW**: Developmental changes in the effects of lidocaine on sodium channels in rat cardiac myocytes. *J Pharmacol Exp Therap* 262:670-676,1992.
18. Liu, W, **Clarkson CW**, Yamasaki S, Chang C, Stolfi A, Pickoff AS: Characterization of the rate-dependent effects of ethmozine on conduction, in vivo, and on the sodium current, in vitro, in the newborn heart. *J Pharmacol Exp Therap* 263:608-616, 1992.
19. **Clarkson CW**, Chang C, Stolfi A, George WJ, Yamasaki S, Pickoff AS: Electrophysiological effects of high cocaine concentrations on intact canine heart: Evidence for modulation by both heart rate and autonomic nervous system. *Circulation* 87:950-962, 1993.
20. Xu Y-Q, Crumb WJ Jr, **Clarkson CW**: Cocaethylene, a metabolite of cocaine and ethanol, is a potent blocker of cardiac sodium channels. *J Pharmacol Exp Therap* 271:319-335,1994.
21. Crumb WJ Jr, Pigot JD, **Clarkson CW**: Comparison of the transient outward current in young and adult human atrial myocytes. Evidence for developmental changes. *Am J Physiol* 268:H1335-H1342, 1995
22. Crumb WJ Jr, **Clarkson CW**: The pH Dependence of cocaine interaction with cardiac sodium channels. *J Pharmacol Exp Therap* 274:1228-1237, 1995.
23. Crumb WJ Jr, Pigot JD, **Clarkson CW**: Description of a non-selective cation current in human atrium. *Circ Res* 77:950-956,1995.
24. **Clarkson, CW**, Xu Y-Q, Chang C, Follmer CH: Analysis of the ionic basis for cocaine's dual effects on repolarization in guinea pig ventricular myocytes *J Mol Cell Cardiol* 28:667-678, 1996.
25. Roca, T, Pigott, JD, **Clarkson CW**, Crumb WJ Jr. L-type calcium current in pediatric and adult human atrial myocytes. Evidence for developmental changes in channel inactivation. *Pediatric Res* 40:462-468,1996.
26. **Clarkson, C**, Crumb W: Analysis scripts help researchers detect heart differences between neonates and adults. *Medical Electronics* 27:47-50,1996.
27. Nenov NI, Crumb WJ Jr, Pigott JD, Harrison LH Jr, **Clarkson CW**: Quinidine interactions with human atrial potassium channels - developmental aspects. *Circ Res* 83:1224-1231,1998.
28. Ferreira, S, Crumb WJ Jr., Carlton, CG, **Clarkson, CW**: Effects of Cocaine and Its Major Metabolites on the HERG Encoded Potassium Channel, *J Pharmacol Exp Therap* 299:220-226,2001
29. Stanat SC, Carlton CG, Crumb WJ Jr., Agrawal KC, **Clarkson CW**: Characterization of the inhibitory effects of erythromycin and clarithromycin on the HERG potassium channel. *Mol Cell Biochem.* 254: 1-7, 2003
30. Taylor JT, Huang L, Keyser B, , Zhuang H, **Clarkson CW**, Li M: High voltage activated calcium channels in pancreatic beta cells: possible role in glucose desensitization. *Am J Physiol. Endocrinol Metab.* Nov; 289(5): E900-8; 2005.

31. Kahn M, **Clarkson C**, Crawford B: Coagulation Team Based Learning Exercise. MedEdPORTAL. AAMC #4054 6/30/2009.
url: <http://services.aamc.org/30/mededportal/servlet/s/segment/mededportal/?subid=4054>
32. Franklin DS, Gibson JW, Samuel JC, Teeter WA, **Clarkson CW**: Use and Benefit of Lecture Recordings in Medical Education. Med Sci Educator 21(1): 21-28, 2011.

Book Chapters, Reviews

1. Hondeghem LM, **Clarkson CW**, and Matsubara T: Bupivacaine: Fast In Slow Out (FISO). Report to Anesthetic and Life Support Drugs Advisory Committee, Department of Health and Human Services, October 4, 1983
2. **Clarkson CW**, Ten Eick RE: Pharmacology. In: Flex Review, Second Edition. Medical Examination Pub. Co. New Hyde Park, N.Y. pp. 59-69, 1984
3. **Clarkson CW**, Inazawa M, Kanaya S, Hondeghem LM, Katzung BG: Evidence for a modulated receptor mechanism of calcium channel blockade. In: Calcium Antagonists. Mechanisms of Action on Cardiac Muscle and Vascular Smooth Muscle. Sperelakis, N. and Caulfield J.B. (eds.). Martinus Nijhoff, Boston. pp. 137-152, 1984
4. **Clarkson CW**, Hondeghem LM: Effects of Antiarrhythmic Drugs On Conduction and Automaticity. In: Regulation of Heart Function. Basic Concepts and Clinical Applications. Rupp, H. (ed.). Thieme Inc., New York, pp. 407-420, 1986
5. Katzung BG, Hondeghem LM, **Clarkson CW**, Matsubara T: Mechanisms for selective actions and interactions of antiarrhythmic drugs. In: Cardiac Electrophysiology and Arrhythmias. Zipes, D., Jalife J. (eds.). Grune and Stratton, Inc. N.Y., pp. 199-205, 1985
6. Hondeghem LM, **Clarkson CW**: Modulated receptor theory and cardiac toxicity of local anesthetics. In: Molecular and Cellular Mechanisms of Anesthetics. Roth, S. and Miller K.W. (eds.). Plenum, NY, pp. 385-393, 1986

Abstracts

1. Novak RF, **Clarkson CW**: The interaction of pyridine, benzene and toluene with human hemoglobin. Fed Proc 37:1123, 1978
2. **Clarkson CW**, Yeh JZ, Ten Eick RE: Interactions of quinidine and procainamide with cardiac Na channels. Circulation 62:1082, 1980
3. **Clarkson CW**, Ten Eick RE: Comparison of activation and deactivation kinetics of the time-dependent outward current in cat ventricular muscle. Physiologist 24:187, 1981
4. **Clarkson CW**, Ten Eick RE: Mechanism of lysophosphatidyl-choline induced depolarization of cat ventricular myocardium. Circulation 64:169, 1981
5. **Clarkson CW**, Ten Eick RE: Leak through slow inward conductance channel underlies LPC-induced depolarization. Circulation 66:302, 1982
6. **Clarkson CW**, Mason JW, Matsubara T, Moyer JW, Hondeghem LM: Slow inactivation in guinea pig ventricular myocardium. Biophys J 41:309a, 1983
7. **Clarkson CW**, Thigpen J, Shnider SM, and Hondeghem LM: Bupivacaine toxicity: fast inactivation block and slow diastolic recovery. Circulation 68:1184, 1983
8. **Clarkson CW**, Hondeghem LM, Matsubara T, Levinson G: Possible mechanism of bupivacaine toxicity. Fast inactivation block with slow diastolic recovery. Anesth Analg 63:199, 1984
9. Hondeghem LM, **Clarkson CW**: Modulated receptor theory and cardiac toxicity of local anesthetics. Int Conf Anaesth., 1984

10. **Clarkson CW**, Hondeghem LM: Evidence that quinidine, lidocaine and bupivacaine interact with a single common receptor site in cardiac sodium channels. *Circulation* 70:1091, 1984
11. **Clarkson CW**, Follmer CH, Yeh JZ, Ten Eick RE, Hondeghem LM: Evidence for two components of sodium channel block by lidocaine in isolated cardiac myocytes. *Circulation* 72:152, 1985
12. Lertora JJJ, Michael RC, King LW, **Clarkson CW**, Wang T: Inotropic actions of desethyl-N-acetylprocainamide (NAPADE) in anesthetized dogs and isolated cat papillary muscles. *Interamerican Soc Clin Pharmacol Therp.* 1986
13. Michael RC, Lertora JJJ, **Clarkson CW**, Wang T, King LW: Inotropic actions of procainamide and desethyl-N-acetyl-procainamide (NAPADE) in cat papillary muscle. *Clin Res* 34:178a, 1986
14. Lertora JJJ, Michael RC, **Clarkson CW**, Wang T, King LW: Inotropic and arrhythmogenic actions of procainamide (PA), N-acetylprocainamide (NAPA) and desethyl-N-acetyl-procainamide (NAPADE) in cat papillary muscle. *Amer Soc Clin Pharmacol Therp.* 1986
15. **Clarkson CW**: Use-dependent block of sodium channels by RAC109 in isolated guinea pig ventricular myocytes is stereospecific. *Circulation* 74:78, 1986
16. **Clarkson CW**, Wang T: Block of cardiac sodium channels by tocainide: evidence for two components of channel block and lack of stereospecificity. *Biophys J* 51:259a, 1987
17. **Clarkson CW**: Effects of proteolytic enzymes on cardiac sodium channel inactivation and block by local anesthetics. *Biophys J* 53:534a, 1988
18. Crumb WJ Jr, **Clarkson CW**: Guarded receptor analysis of cocaine interaction with cardiac sodium channels. *Biophys J* 55: 314a, 1989
19. Crumb WJ Jr, **Clarkson CW**: Cocaine block of cardiac sodium channels in isolated ventricular myocytes. *FASEB J* 3:A1170, 1989
20. Crumb WJ Jr, **Clarkson CW**, Xu Y-Q, Kadowitz PJ: Electrocardiographic evidence for cocaine cardiotoxicity in cat. *Circulation* 80:132, 1989
21. Xu Y-Q, Pickoff AS, **Clarkson CW**: Evidence for differences in phenytoin block of Na channels in adult vs. neonatal rat myocytes. *Circulation* 80:606, 1989
22. Dise T, Stolfi A, **Clarkson C**, Pickoff AS: Rate-dependent effects of lidocaine on conduction in the intact neonatal heart. *Circulation* 80:387, 1989
23. Dise T, Stolfi A, **Clarkson C**, Pickoff AS: N-acetylprocainamide amplifies conduction delay caused by lidocaine in the intact neonatal heart. *Ped Res* 27:233a, 1990
24. **Clarkson CW**, Xu Y-Q, Pickoff AS: Evidence for Developmental changes in lidocaine block of cardiac sodium channels in rat myocytes. *Circulation* 82:11, 1990
25. Crumb WJ Jr, **Clarkson CW**: Evidence for an external binding site for cocaine in cardiac sodium channels. *Biophys J* 59:73a, 1991
26. **Clarkson CW**, Stolfi A, Yamasaki S, George WJ, Pickoff AS: Characterization of the rate-dependent effects of cocaine on conduction in the in vivo canine heart. *Circulation* 84:I-501, 1991
27. Liu W, Yamasaki S, Stolfi A, **Clarkson CW**, Pickoff AS: Characterization of the rate-dependent effects of ethmozine on conduction in the newborn heart. *Am J Cardiol* 68:422, 1991
28. Crumb WJ Jr, **Clarkson CW**: Characterization of the dependence of cocaine block of cardiac sodium channels on internal and external pH. *Biophys J* 61:A133, 1992
29. **Clarkson CW**, Crumb WJ Jr: Characterization of the cardiac sodium channel blocking properties of cocaine's three major metabolites: norcocaine, benzoylecgonine and ecgonine methyl ester. *Biophys J* 61:A113, 1992

30. Liu W, Pickoff AS, **Clarkson CW**: Both internal and external pH influence the kinetics of lidocaine unblocking from cardiac sodium channels. *Biophys J* 61:A112, 1992.
31. **Clarkson CW**, Xu Y-Q, Crumb WJ Jr: Characterization of cocaethylene block of cardiac sodium channels. *FASEB J* 7:A30, 1993.
32. Xu Y-Q, Chang C, Follmer CH, **Clarkson CW**: Analysis of the ionic basis for cocaine's dual effects on repolarization in guinea pig ventricular myocytes. *Biophys J* 66:A83, 1994
33. Hymel LJ, Whitworth A, Wang SN, **Clarkson CW**: Cardiac Ca^{2+} release channel is a high affinity receptor for cardiac glycosides. *Biophys J* 66:A19, 1994
34. **Clarkson CW**, Crumb WJ Jr, Pigot JD, Brown AM: Developmental changes in potassium currents recorded from human atrial myocytes. *Biophys J* 66:A326, 1994
35. **Clarkson CW**, Crumb WJ Jr, Pigot JD: Evidence for developmental changes in the transient outward current in human atrial myocytes. *Clinical and Exp Pharmacol Physiol* 22:(3) A?? March 1995
36. Nenova, N, **Clarkson, CW**: Propranolol blocks the rapid component of the delayed rectifier (I_{Kr}) in guinea pig ventricular myocytes. *Biophys J* 68:A108, 1995
37. Crumb WJ Jr, Pigot JD, **Clarkson CW**: Evidence for developmental changes in the transient outward current in human atrial myocytes. *Biophys J* 68:A108, 1995
38. Hymel LJ, Schroeder AC, Nenova NI, **Clarkson CW**: Ca^{2+} release in ventricular myocytes induced by digitalis glycosides. *J Mol Cell Cardiol* 27:A65, 1995
39. Crumb WJ Jr, Roca TP, Pickoff AS, Pigot JD, **Clarkson CW**: Cation currents in pediatric and adult human cardiac myocytes. *Pediatric Res* (in press)
40. Crumb WJ Jr, Roca TP, Pigot JD, **Clarkson CW**: Calcium-dependent inactivation in human cardiac calcium channels: is inactivation dependent upon internal calcium? *Biophys J* 70:A53, 1996
41. **Clarkson CW**, Chang C: Significant postnatal changes in human cardiac sodium channels: *Biophys J* 70:A279, 1996
42. Nenov N, Heck HA, Munfakh NA, **Clarkson CW**, Crumb WJ Jr: Increased I_{to} associated with diabetes mellitus in human atrium.. *Circulation* 94:I-715, 1996.
43. **Clarkson CW**, Nenov NI, Pigott JD, Harrison L H Jr., Crumb WJ Jr.: Developmental changes in the expression and pharmacology of I_{to} in human atrium. *Canadian J Cardiol* 1997
44. Roca TP, Pigott JD, Harrison LH Jr, Nenov NI, **Clarkson CW**, Crumb WJ Jr: A characterization of the L-type calcium current in human atrium. *Canadian J Cardiol* 1997
45. **Clarkson CW**, Crumb WJ Jr, Guillot M, Athas GB, Garcia MM, Wible B: Expression profiling of ion channels from human atrial myocytes. *FASEB J* 12: A715, 1998.
46. **Clarkson CW**, Montal, D, Zhao F, Becker JR, Agrawal C: Inhibitory effects of TNF- α on human and mouse erg K^+ channels. *Biophys J*. 78: 341A, 2000.
47. Ferreira SW, Crumb WJ Jr, Carlton CG, **Clarkson CW**: Effects of cocaine and its major metabolites on HERG encoded potassium channels. *Biophys J*. (2001).

National Educational Meetings/Presentations (Post Katrina):

1. **Clarkson CW**, Agrawal KC, Mondal D: Peer instruction enhances student performance on pharmacology quizzes. Southern Group on Educational Affairs (SGEA). 2009 Annual Meeting, New Orleans, LA. Abstract/Poster #249. 2009
2. Franklin DS, Gibson JW, Samuel JC, Teeter WA, **Clarkson CW**: Use and benefits of lecture recordings in medical education. Southern Group on Educational Affairs (SGEA). 2009 Annual Meeting, New Orleans, LA. Poster/Abstract #233. 2009
3. Daniel A, Crawford B, Krane K, Kahn M, **Clarkson C**, Dise T, Klingsberg R: A Team Approach to Implementing Team-based Learning: Lessons Learned. Small group discussion. April 3, 2009. Abstract #228 Southern Group on Education Affairs (SGEA), New Orleans 2009.
4. Ficarra M, Crawford B, **Clarkson C**, Barrett D, Gibson J: Assessment of Learning in TBL Educational Sessions. IAMSE Annual Meeting, Poster presentation, July 10, 2010.
5. Pasquale S, Szarek JL, LeDoux EI, **Clarkson CW**. Using Human Patient Simulators to Enhance Basic Science Education Throughout the Undergraduate Medical Curriculum. IAMSE Faculty Development Course, July 10, 2010. Tulane University.
6. **Clarkson, CW**. Just-in-Time-Teaching & Classroom Response Systems. Changing the Emphasis from Teaching to Learning. Annual Meeting of the Group for Research in Pathology Education (GRPE), Jan 15, 2010. New Orleans, LA.
7. Chauvin S, **Clarkson CW**, Szarek J, Ten Eyck R. It's About the Science: The Art and Science of Using Human Patient Simulators to Enhance Basic Science Education. Podium Presentation #608. Society for Simulation in Healthcare. Annual Meeting, New Orleans. 1/25/11.
8. **Clarkson CW**, Franklin D. IAMSE Workshop on Just-in-Time-Teaching in Medical Education. Clarkson CW, Franklin, D International Asson. of Medical School Educators (IAMSE) Meeting, Portland OR, June 25th, 2012.

WEB SITE DEVELOPMENT

• **Online Interactive Self Assessment Quizzes in Medical Pharmacology:**

In the Fall of 2007 I initiated the development of an extensive number of online interactive quiz questions covering all of the learning objectives covered in each lecture in our year-long Medical Pharmacology course. I have also developed quizzes covering all objectives for my 4 hours of cardiac lectures to the first year medical students. These quizzes are written in html (using Hot Potatoes) & posted online. I have completed over 68 subject- based quizzes containing over 750 questions, available on the Pharmwiki website (see below).

• **Pharmwiki:**

I maintain an online "open access" Pharmwiki that serves an information resource for all topics related to medical pharmacology. It has a growing number of case-based learning modules & interactive quizzes, and has become our medical students most often used information resource for pharmacology. url: <https://tmedweb.tulane.edu/pharmwiki/doku.php/>