

Curriculum Vitae

Date Prepared: 12/22/17

Name: William F. Crowley, Jr., MD

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Place of Birth: Meriden, CT

Education

1965 BA Holy Cross College (Honors Curriculum)
1969 MD Tufts Medical School
1992 AM Harvard University (Honorary)

Postdoctoral Training

06/69-06/71 Intern & Assistant Resident, Medicine, Massachusetts General Hospital (MGH)
07/71-01/73 General Medical Officer, Medicine, US Naval Hospital, Newport, RI
07/73-06/74 Senior Resident, Medicine, MGH
07/74-06/75 Clinical Fellow in Endocrinology, Medicine, MGH & Harvard Medical School
07/75-06/77 Clinical & Research Fellow in Endocrinology, MGH & Harvard Medical School

Faculty Academic Appointments

09/74-06/76 Lecturer in Scientific Writing, Harvard College
07/76-06/80 Instructor, Department of Medicine, Harvard Medical School
07/80-06/84 Assistant Professor, Department of Medicine, Harvard Medical School
07/84-06/92 Associate Professor, Department of Medicine, Harvard Medical School
07/92- Professor, Department of Medicine, Harvard Medical School
01/11- Daniel K. Podolsky Professor of Medicine, Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

07/84 - Founder & Chief, Reproductive Endocrine Unit, MGH
07/88 - Physician, Department of Medicine, MGH
07/93-06/95 Chief, Endocrine Division, Department of Medicine, MGH

07/96-04/14 Founder and Director of Clinical Research Program, Mass General Hospital
 07/97 - Adjunct Professor, MGH Institute of Health Professions
 07/07 - Associate Faculty, Center for Human Genetic Research, MGH
 11/14 - Associate Faculty Member, Medical Population Genetics Program, The Broad Institute

Other Professional Positions

1979-1994 Consultant, Contraceptive Development Branch, National Institutes of Health (NIH)/NICHD
 1983-1990 Consultant, Ferring Pharmaceutical Company
 1983- 2013 Consultant, Abbott Diagnostics Laboratories
 1984-1994 Consultant, Ortho Pharmaceutical Company
 1985-1994 Consultant, Genentech Inc
 1987 Consultant, Endocrine and Metabolism Division, FDA
 1990-1994 Scientific Advisory Board, Johnson & Johnson Pharmaceuticals
 1993 Consultant, Janssen Pharmaceuticals
 1993-1998 Scientific Advisory Board, Women’s Health Institute, Wyeth Ayerst Pharmaceuticals
 1993-1995 Scientific Advisory Board, Metpath, Inc.
 1994-2000 Consultant, PRAECIS Pharmaceuticals, Cambridge, MA
 1996-2014 Co-Founder (with R. Langer, PhD), & Chair, Scientific Advisory Board, Combinent BioMedical Systems, Inc.
 1997-2000 Scientific Advisory Board, Ligand Pharmaceuticals, San Diego, CA
 1999 Established Collaboration of Partners Healthcare Inc. with Millennium Pharmaceuticals, Inc
 1999 Established Collaboration of Partners Healthcare Inc. with deCODE Genetics, Inc.
 1999-2000 Board of Directors, Federation of Societies of Experimental Biology (FASEB)
 1999-2002 Consultant, Transkaryotic Therapies, Cambridge, Ma
 2000 Established Collaboration of Partners Healthcare Inc. with MDS Proteomics
 2000-2004 Member, Institute of Medicine’s Clinical Research Roundtable
 2001 Established Collaboration of Partners Healthcare Inc. with Thermo-Finnigan Inc.
 2001-2006 Consultant, Takeda Pharmaceuticals, Chicago, Ill.
 2003-2005 Consultant, QUOSA.com, Boston, MA
 2004-2005 Consultant, Novartis Pharmaceuticals
 2005-2006 Scientific Advisory Board, Nephromics, Inc., Boston, MA
 2006-2010 Scientific Advisory Board, Proventys, Inc., Durham, N.C.
 2007-2011 Chairman, Scientific Advisory Board, MGH/Quest Diagnostics, San Juan Capistrano, CA
 2007- Consultant, Quest Diagnostics, San Juan Capistrano, CA
 2014- Scientific Advisory Board NextGenJane, Boston, MA
 2015- Scientific Advisory Board, Juniper Pharmaceuticals, Boston, MA

Major Administrative Leadership Positions

Local

1983- Founder & Chief, Reproductive Endocrine Unit, Department of Medicine, MGH
 1987-1990 Director, Vincent Research Laboratories, MGH
 1991- Director, NICHD-funded, Harvard Reproductive Endocrine Sciences Center, MGH
 1991-2002 Director, NICHD-funded National Center for Infertility Research, MGH
 1993-1995 Chief, Endocrine Division, Department of Medicine, MGH

1996- 2014 Director, Founder and Director, Mass General Hospital's Clinical Research Program

National and International

1984 NICHD Five Year Planning Committee, NIH
1986-1988 Technical Advisory Committee, Contraceptive Research and Development (CONRAD), U. of Eastern Virginia
1986-1988 National Hormone & Pituitary Program Advisory Committee, NIH
1987-1990 Scientific Program Committee, Endocrine Society
1992-1995 Publications Committee, Endocrine Society
1996 Long Range Planning Committee, Endocrine Society
1996-1997 Nominating Committee, Endocrine Society
1996-1998 Chairman, Professional Affairs Committee, Endocrine Society
1996-1999 Harold Varmus' NIH Directors' Panel on Clinical Research
1999-2000 Executive Committee, FASEB
1999-2002 Council and Executive Committee, Endocrine Society
2000-2002 Presidency, Endocrine Society
2004-2005 Chairman, Internal Advisory Committee, I2B2 Grant, Harvard Medical School
2004-2007 Nominating Committee, Endocrine Society, Chair, 2007
2005-2009 Awards Committee, Endocrine Society, Chair 2007
2007-2011 External Advisory Committee, Master of Science in Clinical Research, U. of Puerto Rico
2009-2013 Endocrine Society Pfizer Awards Committee for Best Publication in JCEM
2010-2012 Research Committee, Arthritis Foundation

Committee Service

1976- New York Academy of Sciences
1980- The Endocrine Society
1990 Chairman of Annual Meeting Steering Committee
1996-2000 Council
2000 President-elect
2001 President
2002 Past-President
1980- American Federation of Clinical Research
1984-2014 Massachusetts Medical Society
1985 American Society of Clinical Investigation (ASCI)
1986- Society for the Study of Reproduction (SSR)
1989- Association of American Physicians (AAP)
1990-1991 MacArthur Foundation, Health and Behavior Network
1991- Lawson-Wilkins Society
1994- Interurban Clinical Club
1996-1998 Peripatetic Club
1997- Human Genome Organization
2006- American Clinical & Climatological Association (ACCA)
2007- American College of Physicians (AAP)

Editorial Activities

Endocrinology
Journal of Clinical Endocrinology & Metabolism (JCEM)
Neuroendocrinology
New England Journal of Medicine (NEJM)
American Journal of Medicine
Science: Translational Medicine
Science

Honors and Prizes

1965 Honors Curriculum & Degree, Holy Cross College
1965 1st Student Member, Tufts Medical School Curriculum Committee
1969 Excellence in Medicine Award, Tufts Medical School & Massachusetts Medical Society
1975-1978 Daland Fellow, American Philosophical Society
1984 Invited Speaker, Laurentian Hormone Conference
1985 President's Award, Best Scientific Paper, Pan American Conference on Fertility
1989 Invited Speaker, Laurentian Hormone Conference
1997 Presidential Lecture, Endocrine Society Annual Meeting
1998 Fuller Albright Clinical Investigator Award, Peripatetic Club
1998 Clinical Investigator Award and Lecture, The Endocrine Society
2000 Mentor of the Year Award, Women in Endocrinology, The Endocrine Society
2000 Honorary Visiting Fellow of The Royal College of Physicians (Ire.)
2002 Award for Excellence in Clinical Research, General Clinical Research Center (GCRC)
2002 The Endocrine Society and Pharmacia Corporation International Award for Excellence in Published Clinical Research, Journal of Clinical Endocrinology & Metabolism
2003 Sanctae Crucis Award, Holy Cross College, Worcester, MA
2005 Fred Conrad Koch Award, The Endocrine Society's highest scientific award
2006 Harrison Memorial Keynote Lecture, Endocrine Society of Australia
2007 International Juried Prize in Endocrinology, IPSEN Foundation
2011- Inaugural Incumbent, Daniel K. Podolsky Professorship in Medicine, Harvard Medical School
2011 Keynote Address, Hellenic Endocrine Society
2012 Kenneth Crispell Lectureship, University of Virginia
2012 Emil Steinberger Award and Keynote Lecture, American Society of Andrology
2014 Del Fisher Visiting Professor, UCLA
2016 Plenary Session Lecture at ENDO 2016

Report of Funded and Unfunded Projects

Funding Information

Past (since 1990)

1990-1994 Neuroendocrine – Gonadal Function in Puberty
5R01HD018169 – NICHD
PI (\$1,368,344 / project)

1991-1992 Supplement: LCRH Physiology in Man: In Vivo and In Vitro Approaches
5R01HD015788 – NICHD

PI (\$31,515/ yr)

1991-1994 Neuroendocrine Control of Reproduction in the Female
R01HD015080 – NICHD
PI (\$1,225,542/ project)

1991-1995 National Center for Infertility Research at MGH
5U54HD029164 – NICHD
PI (\$6,936,325/ project)

1991-1995 Reproductive Endocrine Sciences Center
5U54HD028138 – NICHD
PI (\$2,534,711/yr)

1991- Training Program in Reproductive & Developmental Biology
T32HD007396 – NICHD
PI (\$290,964/ project)

1992-1998 LHRH Physiology in Man: In Vivo and In Vitro Approaches
5R01HD015788 – NICHD
PI (\$870,026/ project)

1996-1998 Supplement: Reproductive Endocrine Sciences Center
5U54HD028138 – NICHD
PI (\$241,835/ project)

1996-2000 Reproductive Endocrine Sciences Center
5U54HD028138 – NICHD
PI (\$3,989,282/yr)

1996-2000 Training Program in Reproductive & Developmental Biology
T32HD007396 – NICHD
PI (\$284,580/ project)

1996-2002 National Center for Infertility Research at MGH
5U54HD029164 – NICHD
PI (\$3,106,807/yr)

1997-2002 Genetics of Reproduction Neuroendocrinology
P30HD028138 – NICHD
PI (\$1,327,259/yr)

2000 - 2001 Supplement LHRH Physiology in Man: In Vivo and In Vitro Approaches
5R01HD015788 – NICHD
PI (\$326,076/yr)

2001 - 2005 Neuroendocrine & Gonadal Control of Male Reproduction
5U54HD028138 – NICHD
PI (\$5,415,258/yr)

2002 - 2005	Male Reproductive Physiology in the Human 5R01HD015788 – NICHD PI (\$1,512,008/yr)
2002 - 2006	National Center for Infertility Research at MGH 1U01HD044417 – NICHD PI (\$2,521,670/yr)
2002 - 2006	Training Program in Reproductive & Developmental Biology T32HD007396 – NICHD PI (\$467,621/yr)
2006 - 2010	Neuroendocrine & Gonadal Control of Male Reproduction 5U54HD028138 – NICHD PI (\$7,178,152/yr)
2007 - 2011	Training Program in Reproductive & Developmental Biology T32HD007396 – NICHD PI (\$959,840/yr)
2008 - 2012	Neuroendocrine Control of Reproduction in the Human 5R01HD015788 – NICHD PI (\$2,274,061/yr)
2009 - 2010	Supplement: Neuroendocrine & Gonadal Control of Male Reproduction 5U54HD028138 – NICHD PI (\$264,144/yr)
Current	
5/1/91-4/30/21	Harvard Reproductive Endocrine Sciences Center of Excellence in Translational Research (Year 27/31) P30-P50-U54 HD-28138 PI (\$1,200,000/yr) It is the goal of this NICDH funded Center of Excellence, The Harvard Center of Excellence in Reproductive Endocrine Science Center to bring to bear several disciplines to define the genetic architecture, functioning and developmental biology the GnRH neuronal system controlling human reproduction. Using a combination of targeted clinical investigation of the human model of Isolated GnRH Deficiency; genetic approaches; molecular and systems biology tools; and bioinformatics, our Center utilizes synergistic approaches to make contributions that would be difficult using other in vitro and in vivo reductionist models.
4/1/14-3/31/19	Training Program in Reproduction, Development, & Genetics T32 – NICHD PI (\$~200,000/yr) It is the goal of this NICHD-funded post-doctoral training program to continue its outstanding record of recruiting and training the most talented and promising physician-scientists and Ph.D.s into the fields of translational research in reproduction, development, and genetics; to expose them to a wide array of well-funded faculty and interesting

biological problems; and to support their career development during their period of emergence as independent, peer-review funded faculty members.

Formally Supervised Trainees

- 1979-1982 Jacquelyn S. Loughlin, MD/Associate Professor and Vice Chair, OB/GYN, Reproductive Endocrinology & Infertility; Hackensack University Medical Center
Isolated rate pituicyte of gonadotrope function
- 1980-1982 Andrew Hoffman, MD/ Professor of Medicine and Molecular and Cellular Physiology, Vice Chair for Academic Affairs, Stanford University Medical School
Pulsatile GnRH treatment of gonadotropin deficiency
- 1980-1982 Andrea E. Dunaif, MD/Professor of Medicine, Associate Chief of Medicine for Research, Northwestern University
Impact of androgens on the female HPG axis
- 1980-1983 Marco Filicori, MD, PhD/Associate Professor, Department of OB/GYN, University of Bologna, CEO of Repro Rx, Bologna, Italy
Physiology of GnRH in the human menstrual cycle
- 1982-1985 Daniel Spratt, MD/Professor of Medicine, Director of Division of Reproductive Endocrinology & Infertility, Maine Medical Center
Physiology and pathophysiology of GnRH in the male
- 1983-1985 Todd Brodie, FACP, MD/Clinical Professor of Medicine, University of Arizona
GnRH regulation of gonadotropin secretion in the human
- 1983-1985 M. Joan Mansfield, MD/Assistant Professor of Pediatrics, Harvard Medical School, Associate Clinical Director, Pediatric, Adolescent, and Young Adult Section
Central precocious puberty; growth & development
- 1983-1986 Paul Boepple, MD/Assistant Professor of Pediatrics, Harvard Medical School
Pathogenesis and treatment of precocious puberty
- 1983-1987 Margaret Wierman, MD/Professor of Medicine; Chief of Endocrinology, Denver VAMC
Gonadal regulation of gonadotropin subunit gene expression; physiology of puberty
- 1984-1987 Joel Finkelstein, MD/Professor of Medicine, Harvard Medical School
Physiology and pathophysiology of GnRH in the male
- 1984-1987 Nanette Santoro, MD/Professor of Medicine, Chief of OB/GYN , U. of Colorado
Neuro-endocrine controls of FSH/LH secretion in the human female
- 1984-1987 Janet Hall, MD/Professor of Medicine, Harvard Medical School, Chief Medical Officer, NIEHS
Physiology of GnRH secretion in the human female
- 1984-1987 Louis O’Dea, Chief Medical Officer, Oxford Immunotec, MD/Senior Vice President, Chief Medical Officer, Radius Health, Inc., Head of Clinical Development, Reproductive and Metabolic Health at Serono International, Chief Medical Officer, Japan and Oceania at Serono
Double monoclonal RIA of prolactin; physiology of GnRH in the male
- 1986-1988 Kathryn Martin, MD/Assistant Professor of Medicine, Harvard Medical School
Pharmacologic induction of ovulation
- 1986-1988 Helen Dichek, MD/Associate Professor of Pediatrics, University of Washington, School of Medicine
Progesterin dependent proteins
- 1987-1989 Ann Taylor, MD/Senior Disease Area Head; Novartis Institute for BioMedical research, Inc. Steroidal regulation of gonadotropin secretion during the menstrual cycle
- 1987-1990 Hal Landy, MD/Vice President, Medical Affairs & Chief Medical Officer, Enobia Pharma Montreal, Quebec, CN. Urinary gonadotropin secretion in normal and disease states

- 1987-1991 Jeffrey Weiss, PhD/Research Professor, Northwestern University Medical School
Regulation of LH & FSH beta subunit biosynthesis & secretion in dispersed pituicytes by GnRH & activin
- 1991-1993 Jean Mulder, MD/Instructor in Medicine; Harvard Medical School
Human FSH receptor kinetics
- 1991-1993 Joanne Waldstreicher, MD/Chief Medical Officer, Johnson & Johnson Pharmaceutical

Genetics of GnRH deficiency in the human

- 1991-1993 Sophie Christin-Maitre, MD/PhD, Professor of Medicine, Universite Pierre et Marie Curie, Paris VI, Paris, France. hFSH receptor signaling bioassay
- 1991-1993 Lisa Halvorson, MD/Associate Professor, OB/GYN, University of Texas Southwestern Medical School

Gonadotropin subunit biosynthesis

- 1991-1993 Tamara Callahan, MD/Assistant Professor, OB/GYN, Vanderbilt University, Nashville, TN
Economic impact of multiple gestation
- 1991-1994 Geralyn Messerlian, MD/Professor of Pathology and Laboratory Medicine, Brown University. Measurement of inhibin dimer and its subunits
- 1993-1996 Vivian Fuh, MD, FACP/Director, Worldwide Regulatory Affairs, Merck Research Laboratories. Biologic determinants of LH half-time
- 1993-1996 Francois Pralong, MD/Professor Ordinaire and Co-Chief (with Dr. Nelly Pitteloud) of Endocrinology and Metabolism, Department of Medicine, University Hospital, Lausanne, Switzerland. Galanin as a modulator of gonadotroph biosynthesis
- 1994-1996 Nicoletta Di Simone, MD/Professor, OB/GYN, Catholic University of Sacred Heart, Rome, Italy. Inhibin/activin/follistatin/activin receptor expression and action in human ovarian cancer cell lines
- 1994-1996 Neoklis Georgopoulos, MD, PhD/Associate Professor of OB/GYN, University of Patras Medical School, Patras, Greece. GnRH & KAL gene mutations in idiopathic hypogonadotropic hypogonadism
- 1994-1997 Lisa Nachtigall, MD/Associate Professor of Medicine; Harvard Medical School
Physiology of inhibin B in the male
- 1994-1997 Corrine Welt, MD/Professor of Medicine, University of Utah School of Medicine
Inhibin & activin subunits & receptors in ovarian cancer; inhibin A&B physiology in females during aging
- 1995-1997 Stephanie Seminara, MD/Professor of Medicine, Harvard Medical School
Genetics of GnRH deficiency
- 1995-1996 Erica Marsh, MD/Assistant Professor, OB/GYN; Northwestern University
Circadian studies in post-menopausal women, studies of hormonal dynamics in Caucasian & African American women
- 1996-1998 Helene Lavoie, MD, CSPQ, FRCPC/ PROCREA Clinques, Mont-Royal, Quebec, Canada
Sleep/circadian/hormonal interactions with aging
- 1996-1998 Julie Sharpless, MD/ Assistant Professor of Medicine, University of North Carolina, Chapel Hill. Gonadotropic dynamics in PCOS; dynamics of LH clearance in postmenopausal and normal women
- 1996-1999 Frances Hayes, MD/Associate Professor of Medicine, Harvard Medical School; Consultant Endocrinologist and Professor, St. Vincent's Hospital; University College Dublin, Dublin, Ireland. Sex steroid vs non-sex steroid control of FSH secretion in males
- 1997-1998 Richard Bribiescas, PhD/ Professor and Chair, Anthropology Department, Yale University

- Impact of exercise on the reproductive axis in males
- 1997-1999 Mark Palmert, MD, PhD/Associate Professor, Department of Paediatrics, University of Toronto. The role of GnRH α therapy in growth and metabolic outcomes of children with central precocious puberty
- 1998-1999 Yousef Bo-Abbas, MD, FRCPC/ Assistant Professor of Medicine, Faculty of Medicine, Kuwait University, Kuwait. Suppression of androgens in PCOS
- 1998-1999 Milena Beranova (Kralickova), PhD/Professor of Histology & Embryology and Associate Dean, Charles University, Czech Republic. Phenotype/genotype studies in GnRH receptor defects
- 1998-2000 Luciana Oliveira, MD/Associate Professor of Physiology, Federal University of Bahia, Brazil. Role of KAL gene mutations in idiopathic hypogonadotropic hypogonadism
- 1998-2002 Sarah Leupen, PhD/Lecturer, University of Maryland Baltimore County
Role of potassium channel in GABA-ergic control of GnRH secretion
- 1998-2001 Nelly Pitteloud, MD/Professor Ordinaire and Co-Chief of Endocrinology, Metabolism (with Francois Pralong) and Pediatric Endocrinology, University Hospital, Lausanne, Switzerland
Role of sex steroids, inhibin and GnRH in FSH secretion in the human
- 2000-2002 Yanira Pagan, MD/Assistant Professor of Pediatrics, University of Puerto Rico, San Juan. Estradiol vs inhibin in the control of FSH in women; is GnRH III the putative FSHRN in the human
- 2002-2006 Maria Yialamas, MD/Assistant Professor of Medicine, Harvard Medical School, Associate Program Director, Internal Medicine Residency. Effect of varying testosterone levels on insulin sensitivity
- 2003-2005 Juan Carl Pallais, MD; Assistant Professor of Medicine, Harvard Medical School. Effect of kisspeptin & related peptides on GPR54
- 2004-2005 Marissa Caudill, MD, PhD Research Fellow, Semel Institute, UCLA. Response to long-term GnRH pump therapy in Kallmann's syndrome patients with Kal1 mutations
- 2005-2007 Taneli Raivio, MD, PhD/Docent, Associate Professor of Pediatric Endocrinology, Biomedicum Helsinki, University of Helsinki, Finland. The role of FGFR1 pathway in idiopathic hypogonadotropic hypogonadism
- 2007-2010 Cecilia Martin, PhD/Research Fellow in Medicine, Harvard Medical School. The role of Prokineticin2 system in the ontogeny of GnRH neurons
- 2008-2009 Magdalena Avbelj, MD, PhD/Associate Professor in Pediatric Endocrinology, University of Ljubljana, Slovenia. The impact of copy number variations in etiology of Kallmann's syndrome
- 2008-2010 Elena Gianetti, MD, Assistant Professor, Pisa, Italy, Physiologic studies of kisspeptin pathway using knockout mice models
- 2008-2010 Gerasimos Sykiotis, MD, PhD/Endocrinologist, Assistant Professor of Reproductive Endocrinology, University of Patras Patras, Greece. Oligogenicity in idiopathic hypogonadotropic hypogonadism
- 2009- Ravi Balasubramanian, MD, PhD/Assistant Professor of Medicine, Harvard Medical School. The role of Prokineticin pathway in idiopathic hypogonadotropic hypogonadism
- 2010-2012 Flavia Amanda Costa Barbosa, MD/Assistant Professor of Medicine, Brazil. Comparative analysis of Reproductive and non-Reproductive phenotypes in Isolated GnRH deficient subjects harboring mutations in KAL1, FGF8 and PROK2 signaling pathways.
- 2011-2013 Jin Ho Choi, MD, PhD/Associate Professor of Pediatrics, Seoul, Korea. Founder Mutations in isolated GnRH Deficiency
- 2012 Maria Stamou, MD, Research Fellow, Massachusetts General Hospital
- 2012 Kimberly Cox, MD, Research Fellow, Massachusetts General Hospital
- 2012 Raquel Cano, MD, Research Fellow, Massachusetts General Hospital

Invited Presentations and Courses

Regional

- 1982 Visiting Professor, Yale University, New Haven CT
1998 Visiting Professor, Dartmouth Medical School, Hanover, NH
2009 Visiting Professor, Dartmouth-Hitchcock Medical Center, Hanover, NH
2011 Gordon Research Conference Lecturer: "Unique Approaches to Mapping Developmental Pathways by Human Mutations: Lessons from Isolated GnRH Deficiency"/Lecturer. Mammalian Gametogenesis & Embryogenesis, Gordon Research Conference, Waterville Valley, NH

National

- 1981 Leathem Lecturer, Rutgers University, Newark, NJ
1982 Israel Mackler Lecturer, Albert Einstein College of Medicine, Bronx, NY
1982 Winkler Memorial Lecture, University of Buffalo, Buffalo, NY
1983 Visiting Professor, Duke University, Durham, NC
1983 Visiting Professor, New York Obstetrical Society, New York, NY
1985 Visiting Professor, George Washington University, Washington, DC
1989 Visiting Professor, University of Miami, Miami, FL
1989 Goldfarb Memorial Lecture, Vanderbilt University, Nashville, TN
1990 Visiting Faculty Member, Mayo Clinic, Rochester, MN
1990 Visiting Professor, University of Chicago, Chicago, IL
1994 Visiting Professor, University of Virginia, Charlottesville, VA
1994 Plenary Session Speaker, The American Fertility Society, Birmingham, AL
1995 Visiting Professor, Northwestern Medical School, Chicago, IL
1995 James M. Cuzzo Memorial Lecture, University of Pennsylvania, Philadelphia, PA
1996 Eric Reiss Memorial Lecture, University of Miami, Miami, FL
1999 Visiting Professor, Michigan State University, East Lansing, MI
2000 Visiting Professor, Albert Einstein School of Medicine, Bronx, NY
2001 Visiting Professor, Baylor College of Medicine, Houston, TX
2001 James Givens Visiting Professor of Medicine, University of Tennessee, Memphis, TN
2002 Visiting Professor, Northwestern Medical School, Chicago, IL
2002 Visiting Professor, St. Jude Children's Research Hospital, Memphis, TN
2002 Visiting Professor, University of Chicago, Chicago, IL
2002 Robert L. Rosenfield Lecture, University of Chicago, Chicago, IL
2002 Ernst Knobil Memorial Lecture, University of Pittsburgh Medical School, Pittsburgh, PA
2002 Visiting Professor, Morehouse School of Medicine, Atlanta, GA
2003 University Lecture Series and Visiting Professor, University of Texas Southwestern, Dallas, TX
2003 Buerki Visiting Professor, Henry Ford Hospital, Detroit, MI
2004 John W. Ensink Visiting Lecture, University of Washington, Seattle, WA
2004 1st Neena B. Schwartz Lecturer, Northwestern University, Chicago, IL
2007 Landes/Merimon Lecture, U. No. Carolina School of Medicine Student Research Day, Chapel-Hill, NC
2007 Annual Pediatric Endocrinology Symposium, Infants & Children's Hospital of Brooklyn. Maimonides and St. Barnabas Medical Center, Brooklyn, NY
2007 The Griff Ross Memorial Lecture, National Institutes of Health (NIH), Bethesda, MD
2007 History of Medicine Lecture, NIH, Bethesda, MD
2007 Dean's Distinguished Lecture, University of Arkansas Medical School, Little Rock, AR

- 2008 Henry Turner Lectureship, Oklahoma Health Sciences Center, Oklahoma City, OK
- 2008 Robert Blizzard Lecture, Pediatric Academic Societies Meeting, Honolulu, HI
- 2011 “The Year in Endocrine Genetics” Endocrine Society Annual Meeting
- 2011 Department of Molecular & Cellular Biology Seminar Series, Baylor Medical Center, Houston, TX
- 2012 Kenneth Crispell Lectureship, University of Virginia, Charlottesville, VA
- 2012 Emil Steinberger Memorial Lecture, American Society of Andrology Annual Meeting, Tucson, AZ
- 2012 Inaugural James L. Voogt Lecture in Neuroendocrinology, U. of Kansas Medical Center, Kansas City, MO
- 2012 Bruce Stewart Memorial Lecture, ASRM Annual Meeting, San Diego, CA
- 2013 Ian M. Burr Lecture/Vanderbilt University School of Medicine, Nashville, TN
- 2013 Van Wyk Lecture/ University of North Carolina, Chapel Hill, NC. International
- 1996 Sandoz Lecturer, Canadian Endocrine Society, Montreal, Quebec, Canada
- 1996 Eli Lilly Memorial Lecture, McGill University, Montreal, Quebec, Canada
- 2006 United Kingdom Clinical Endocrinology Trust Visiting Professor
- 2006 Keynote Speaker, European Congress of Endocrinology, Glasgow, UK
- 2006 “Understanding the genetic control of puberty in the human”/Plenary Lecture. 8th European Congress of Endocrinology, Glasgow, UK
- 2007 Visiting Professor, University of Puerto Rico, San Juan, Puerto Rico
- 2008 Plenary Lecture, European Neuroendocrine Society, Southampton, UK
- 2008 Claude Kordon Endocrine Prize Lecture, Eur. Neuroendocrine Association Meeting, Antalya, Turkey
- 2010 “New Paradigms for Translational Research: Examples from Endocrinology”/Keynote Speaker. Annual Meeting of the Association of Anatomy Cell Biology and Neurobiology Chairpersons, Curacao, Netherlands Antilles
- 2011 Plenary Lecture, Pan-Hellenic Congress of Endocrinology and Metabolism, Thessaloniki, Greece
- 2011 Plenary Lecture, Biological Variability of Growth & Puberty: Genetics to Management, London, UK
- 2014 Plenary Lecture, Mexican Endocrine Society
- 2014 Plenary Lecture, Tours International Meeting on Gonadotropins
- 2014 Plenary Lecture, Siena Meeting on Stress and Reproduction
- 2015 Plenary Lecture, ASCI/AAP Annual Meeting
- 2016 Plenary Lecture, Endocrine Society Annual Meeting. Current Licensure and Certification
- 1971 Massachusetts Medical License
- 1974 American Board of Internal Medicine
- 1977 American Board of Internal Medicine (Endocrinology & Metabolism). Practice Activities. Dr. Crowley maintains a small clinical/referral practice limited to reproductive endocrinology in the Reproductive Endocrine Associates Practice that he founded in 1984 as part of the establishment of the Reproductive Endocrine Unit of the Department of Medicine. For 30 years, he served as an Attending Physician in Medicine on the Bigelow Medical Service and the Endocrine Consultant for the MGH for a one month each academic year.

Report of Technological and Other Scientific Innovations

Recognition

- 1992- Best Doctors in America

Patents

Currently updating: Juniper Pharmaceuticals has purchased the exclusive rights to several of the MGH patents Robert Langer and I have filed using a novel trans-vaginal ring drug delivery platform.

[Report of Scholarship](#)

Publications

Peer reviewed publications in print or other media

1. **Crowley WF.** Hypertension and peripheral edema in a man with suprarenal mass. *N Engl J Med* 1976;295:774-77.
2. **Crowley WF Jr,** Ridgway EC, Bough EW, Francis GS, Daniels GH, Kourides IA, Myers GS, Maloof F. Noninvasive evaluation of cardiac function in hypothyroidism. Response to gradual thyroxine replacement. *N Engl J Med.* 1977 Jan 6;296(1):1-6. PMID: 830262
3. Bough EW, **Crowley WF,** Ridgway C, Walker H, Maloof F, Myers GS, Daniels GH. [Myocardial function in hypothyroidism. Relation to disease severity and response to treatment.](#) *Arch Intern Med.* 1978 Oct;138(10):1476-80. PMID: 708167
4. Hall DA, Hann LE, Ferrucci JT Jr, Black EB, Braitman BS, **Crowley WF,** Nikrul N, Kelley JA. [Sonographic morphology of the normal menstrual cycle.](#) *Radiology.* 1979 Oct;133(1):185-8. PMID: 472289
5. **Crowley WF Jr,** Beitins IZ, Vale W, Kliman B, Rivier J, Rivier C, McArthur JW. [The biologic activity of a potent analogue of gonadotropin-releasing hormone in normal and hypogonadotropic men.](#) *N Engl J Med.* 1980 May 8;302(19):1052-7. PMID: 6767977
6. **Crowley WF Jr,** McArthur JW. [Simulation of the normal menstrual cycle in Kallman's syndrome by pulsatile administration of luteinizing hormone-releasing hormone \(LHRH\).](#) *J Clin Endocrinol Metab.* 1980 Jul;51(1):173-5. PMID: 6247361
7. **Crowley WF Jr,** Comite F, Vale W, Rivier J, Loriaux DL, Cutler GB Jr. Therapeutic use of pituitary desensitization with a long-acting lhrh agonist: a potential new treatment for idiopathic precocious puberty. *J Clin Endocrinol Metab.* 1981 Feb;52(2):370-2. PMID: 6780592
8. Loughlin JS, Badger TM, **Crowley WF Jr.** Perfused pituitary cultures: a model for LHRH regulation of LH secretion. *Am J Physiol.* 1981 Jun;240(6):E591-6. PMID: 7018252
9. Comite F, Cutler GB Jr, Rivier J, Vale WW, Loriaux DL, **Crowley WF Jr.** Short-term treatment of idiopathic precocious puberty with a long-acting analogue of luteinizing hormone-releasing hormone. A preliminary report. *N Engl J Med.* 1981 Dec 24;305(26):1546-50. PMID: 6458765
10. Hier DB, **Crowley WF Jr.** Spatial ability in androgen-deficient men. *N Engl J Med.* 1982 May 20;306(20):1202-5. PMID: 7070432
11. Hoffman AR, **Crowley WF Jr.** Induction of puberty in men by long-term pulsatile administration of low-dose gonadotropin-releasing hormone. *N Engl J Med.* 1982 Nov 11;307(20):1237-41. PMID: 6813732
12. Filicori M, Hall DA, Loughlin JS, Rivier J, Vale W, **Crowley WF Jr.** A conservative approach to the management of uterine leiomyoma: pituitary desensitization by a luteinizing hormone-releasing hormone analogue. *Am J Obstet Gynecol.* 1983 Nov 15;147(6):726-7. PMID: 6356927
13. Mansfield MJ, Beardsworth DE, Loughlin JS, Crawford JD, Bode HH, Rivier J, Vale W, Kushner DC, Crigler JF Jr, **Crowley WF Jr.** Long-term treatment of central precocious puberty with a long-acting analogue of luteinizing hormone-releasing hormone. Effects on somatic growth and skeletal maturation. *N Engl J Med.* 1983 Nov 24;309(21):1286-90. PMID: 6415479

14. Filicori M, Butler JP, **Crowley WF Jr.** Neuroendocrine regulation of the corpus luteum in the human. Evidence for pulsatile progesterone secretion. *J Clin Invest.* 1984 Jun;73(6):1638-47. PMID: 6427277
15. Dunaif A, Scully RE, Andersen RN, Chapin DS, **Crowley WF Jr.** The effects of continuous androgen secretion on the hypothalamic-pituitary axis in woman: evidence from a luteinized thecoma of the ovary. *J Clin Endocrinol Metab.* 1984 Sep;59(3):389-93. PMID: 6086692
16. Dunaif A, Hoffman AR, Scully RE, Flier JS, Longcope C, Levy LJ, **Crowley WF Jr.** Clinical, biochemical, and ovarian morphologic features in women with acanthosis nigricans and masculinization. *Obstet Gynecol.* 1985 Oct;66(4):545-52. PMID: 3900841
17. Spratt DI, **Crowley WF Jr.**, Butler JP, Hoffman AR, Conn PM, Badger TM. Pituitary luteinizing hormone responses to intravenous and subcutaneous administration of gonadotropin-releasing hormone in men. *J Clin Endocrinol Metab.* 1985 Nov;61(5):890-5. PMID: 3900124
18. Wierman ME, Beardsworth DE, Mansfield MJ, Badger TM, Crawford JD, Crigler JF, Bode HH, Loughlin JS, Kushner DC, Scully RE, Hoffman WH, **Crowley WF Jr.** Puberty without gonadotropins: a unique mechanism of sexual development. *N Engl J Med* 1985; 312:65-72.
19. Dunaif A, Hoffman AR, Scully RE, Flier JS, Longcope C, Levy LJ, **Crowley WF.** Clinical, biochemical, and ovarian morphologic features in women with acanthosis nigricans and masculinization. *Obstet Gynecol* 1985; 66:545-52.
20. **Crowley WF**, Filicori M, Spratt DI, Santoro NF. The physiology of gonadotropin-releasing hormone (GnRH) secretion in men and women. *Rec Prog Horm Res* 1985; 41:473-531.
21. Spratt DI, Chin WW, Ridgway EC, **Crowley WF Jr.** Administration of low dose pulsatile gonadotropin-releasing hormone (GnRH) to GnRH-deficient men regulates free alpha-subunit secretion. *J Clin Endocrinol Metab.* 1986 Jan;62(1):102-8. PMID:2415548
22. Wierman ME, Beardsworth DE, Crawford JD, Crigler JF Jr, Mansfield MJ, Bode HH, Boepple PA, Kushner DC, **Crowley WF Jr.** Adrenarche and skeletal maturation during luteinizing hormone releasing hormone analogue suppression of gonadarche. *J Clin Invest.* 1986 Jan;77(1):121-6. PMID:2935557
23. Santoro N, Wierman ME, Filicori M, Waldstreicher J, **Crowley WF Jr.** Intravenous administration of pulsatile gonadotropin-releasing hormone in hypothalamic amenorrhea: effects of dosage. *J Clin Endocrinol Metab.* 1986 Jan;62(1):109-16. PMID:3079597
24. Butler JP, Spratt DI, O'Dea LS, **Crowley WF Jr.** Interpulse interval sequence of LH in normal men essentially constitutes a renewal process. *Am J Physiol.* 1986 Mar;250(3 Pt 1):E338-40. PMID:3513617
25. Filicori M, Santoro N, Merriam GR, **Crowley WF Jr.** Characterization of the physiological pattern of episodic gonadotropin secretion throughout the human menstrual cycle. *J Clin Endocrinol Metab.* 1986 Jun;62(6):1136-44. PMID:3084534
26. Hall DA, **Crowley WF**, Wierman ME, Simeone JF, McCarthy KA. Sonographic monitoring of LHRH analogue therapy in idiopathic precocious puberty in young girls. *J Clin Ultrasound.* 1986 Jun;14(5):331-8. PMID:3088048
27. Spratt DI, Finkelstein JS, Badger TM, Butler JP, **Crowley WF Jr.** Bio- and immunoactive luteinizing hormone responses to low doses of gonadotropin-releasing hormone (GnRH): dose-response curves in GnRH-deficient men. *J Clin Endocrinol Metab.* 1986 Jul;63(1):143-50. PMID:3519645
28. Veldhuis JD, Samojlik E, Evans WS, Rogol AD, Ridgeway CE, **Crowley WF**, Kolp L, Checinska E, Kirschner MA, Thorner MO, et al. Endocrine impact of pure estradiol replacement in postmenopausal women: alterations in anterior pituitary hormone release and circulating sex steroid hormone concentrations. *Am J Obstet Gynecol.* 1986 Aug;155(2):334-9. PMID:3740150

29. Spratt DI, Finkelstein JS, O'Dea LS, Badger TM, Rao PN, Campbell JD, **Crowley WF Jr.** Long-term administration of gonadotropin-releasing hormone in men with idiopathic hypogonadotropic hypogonadism. A model for studies of the hormone's physiologic effects. *Ann Intern Med.* 1986 Dec;105(6):848-55. *PMID:3096182*
30. Santoro N, Filicori M, Spratt D, **Crowley WF.** Gonadotropin-releasing hormone (GnRH) physiology in men and women. *Acta Medica Hungarica* 1986; 43:201-21.
31. Waldhauser F, Lieberman HR, Lynch HJ, Waldhauser M, Herkner K, Frisch H, Vierhapper H, Waldhausl W, Schemper M, Wurtman RJ, **Crowley WF.** A pharmacological dose of melatonin increases PRL levels in males without altering those of GH, LH, FSH, TSH, testosterone, or cortisol. *Neuroendocrinology* 1987; 46:125-30
32. Spratt DI, Carr DB, Merriam GR, Scully RE, Rao PN, **Crowley WF Jr.** The spectrum of abnormal patterns of gonadotropin-releasing hormone secretion in men with idiopathic hypogonadotropic hypogonadism: clinical and laboratory correlations. *J Clin Endocrinol Metab.* 1987 Feb;64(2):283-91. *PMID:3098771*
33. Klibanski A, Deutsch PJ, Jameson JL, Ridgway EC, **Crowley WF,** Hsu DW, Habener JF, Black PM. Luteinizing hormone-secreting pituitary tumor: biosynthetic characterization and clinical studies. *J Clin Endocrinol Metab.* 1987 Mar;64(3):536-42. *PMID:3102541*
34. Finkelstein JS, Klibanski A, Neer RM, Greenspan SL, Rosenthal DI, **Crowley WF Jr.** Osteoporosis in men with idiopathic hypogonadotropic hypogonadism. *Ann Intern Med.* 1987 Mar;106(3):354-61. *PMID:3544993*
35. Phillips A, Hahn DW, Klimek S, McGuire JL, **Crowley WF.** Sensitivity differences in reproductive/endocrine organs to chronically administered LHRH agonists in female rats. *Life Sci.* 1987 Apr 6;40(14):1379-89. *PMID:3550346*
36. Spratt DI, Finkelstein JS, Butler JP, Badger TM, **Crowley WF Jr.** Effects of increasing the frequency of low doses of gonadotropin-releasing hormone (GnRH) on gonadotropin secretion in GnRH-deficient men. *J Clin Endocrinol Metab.* 1987 Jun;64(6):1179-86. *PMID:3106396*
37. Waldstreicher J, Santoro NF, Hall JE, Filicori M, **Crowley WF Jr.** Hyperfunction of the hypothalamic-pituitary axis in women with polycystic ovarian disease: indirect evidence for partial gonadotroph desensitization. *J Clin Endocrinol Metab.* 1988 Jan;66(1):165-72. *PMID:2961784*
38. Mansfield MJ, Rudlin CR, Crigler JF Jr, Karol KA, Crawford JD, Boepple PA, **Crowley WF Jr.** Changes in growth and serum growth hormone and plasma somatomedin-C levels during suppression of gonadal sex steroid secretion in girls with central precocious puberty. *J Clin Endocrinol Metab.* 1988 Jan;66(1):3-9. *PMID:2961786*
39. Finkelstein JS, McCully WF, MacLaughlin DT, Godine JE, **Crowley WF Jr.** The mortician's mystery. Gynecomastia and reversible hypogonadotropic hypogonadism in an embalmer. *N Engl J Med.* 1988 Apr 14;318(15):961-5. *PMID:3352686*
40. Spratt DI, **Crowley WF Jr.** Pituitary and gonadal responsiveness is enhanced during GnRH-induced puberty. *Am J Physiol.* 1988 May;254(5 Pt 1):E652-7. *PMID:3129946*
41. Spratt DI, O'Dea LS, Schoenfeld D, Butler J, Rao PN, **Crowley WF Jr.** Neuroendocrine-gonadal axis in men: frequent sampling of LH, FSH, and testosterone. *Am J Physiol.* 1988 May;254(5 Pt 1):E658-66. *PMID:3129947*

42. Finkelstein JS, Badger TM, O'Dea LS, Spratt DI, **Crowley WF**. Effects of decreasing the frequency of gonadotropin-releasing hormone stimulation on gonadotropin secretion in gonadotropin-releasing hormone-deficient men and perfused rat pituitary cells. *J Clin Invest*. 1988 Jun;81(6):1725-33. *PMID:3290251*
43. Hall JE, Brodie TD, Badger TM, Rivier J, Vale W, Conn PM, Schoenfeld D, **Crowley WF Jr**. Evidence of differential control of FSH and LH secretion by gonadotropin-releasing hormone (GnRH) from the use of a GnRH antagonist. *J Clin Endocrinol Metab*. 1988 Sep;67(3):524-31. *PMID:3137243*
44. Alonso-Whipple C, Couet ML, Doss R, Koziarz J, Ogunro EA, **Crowley WF Jr**. Epitope mapping of human luteinizing hormone using monoclonal antibodies. *Endocrinology*. 1988 Oct;123(4):1854-60. *PMID:2458249*
45. Whitcomb RW, Sangha JS, Schneyer AL, **Crowley WF Jr**. Improved measurement of free alpha subunit of glycoprotein hormones by assay with use of a monoclonal antibody. *Clin Chem*. 1988 Oct;34(10):2022-5. *PMID:2458863*
46. Boepple PA, Mansfield MJ, Link K, Crawford JD, Crigler JF, Kushner DC, Blizzard RM, **Crowley WF**. Impact of sex steroids and their suppression on skeletal growth and maturation. *Am J Physiol* 1988; 255:E559-66. *PMID:3052107*
47. Santoro N, Butler JP, Filicori M, **Crowley WF Jr**. Alterations of the hypothalamic GnRH interpulse interval sequence over the normal menstrual cycle. *Am J Physiol*. 1988 Nov;255(5 Pt 1):E696-701. *PMID: 3056034*
48. Klibanski A, Jameson JL, Biller BM, **Crowley WF Jr**, Zervas NT, Rivier J, Vale WW, Bikkal H. Gonadotropin and alpha-subunit responses to chronic gonadotropin-releasing hormone analog administration in patients with glycoprotein hormone-secreting pituitary tumors. *J Clin Endocrinol Metab*. 1989 Jan;68(1):81-6. *PMID:2535852*
49. O'Dea LS, Finkelstein JS, Schoenfeld DA, Butler JP, **Crowley WF Jr**. Interpulse interval of GnRH stimulation independently modulates LH secretion. *Am J Physiol*. 1989 Apr;256(4 Pt 1):E510-5. *PMID:2650563*
50. Finkelstein JS, Spratt DI, O'Dea LS, Whitcomb RW, Klibanski A, Schoenfeld DA, **Crowley WF Jr**. Pulsatile gonadotropin secretion after discontinuation of long term gonadotropin-releasing hormone (GnRH) administration in a subset of GnRH-deficient men. *J Clin Endocrinol Metab*. 1989 Aug;69(2):377-85. *PMID:2502554*
51. Weiss J, **Crowley WF Jr**, Jameson JL. Normal structure of the gonadotropin-releasing hormone (GnRH) gene in patients with GnRH deficiency and idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab*. 1989 Aug;69(2):299-303. *PMID:2546961*
52. Hopkins CC, Hall JE, Santoro NF, Martin KA, Filicori M, **Crowley WF Jr**. Closed intravenous administration of gonadotropin-releasing hormone: safety of extended peripheral intravenous catheterization. *Obstet Gynecol*. 1989 Aug;74(2):267-70. *PMID:2664612*
53. Finkelstein JS, Klibanski A, Neer RM, Doppelt SH, Rosenthal DI, Segre GV, **Crowley WF Jr**. Increases in bone density during treatment of men with idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab*. 1989 Oct;69(4):776-83. *PMID:2674186*
54. Boepple PA, Mansfield MJ, Crawford JD, Crigler JF Jr, Blizzard RM, **Crowley WF Jr**. Gonadotropin-releasing hormone agonist treatment of central precocious puberty: an analysis of growth data in a developmental context. *Acta Paediatr Scand Suppl*. 1990;367:38-43. *PMID:2220386*

55. Hall JE, Whitcomb RW, Rivier JE, Vale WW, **Crowley WF Jr.** Differential regulation of luteinizing hormone, follicle-stimulating hormone, and free alpha-subunit secretion from the gonadotrope by gonadotropin-releasing hormone (GnRH): evidence from the use of two GnRH antagonists. *J Clin Endocrinol Metab.* 1990 Feb;70(2):328-35. *PMID:2105329*
56. Landy H, Schneyer AL, Whitcomb RW, **Crowley WF Jr.** Validation of highly specific and sensitive radioimmunoassays for lutropin, follitropin, and free alpha subunit in unextracted urine. *Clin Chem.* 1990 Feb;36(2):340-4. *PMID:2105862*
57. Weiss J, Jameson JL, Burrin JM, **Crowley WF Jr.** Divergent responses of gonadotropin subunit messenger RNAs to continuous versus pulsatile gonadotropin-releasing hormone in vitro. *Mol Endocrinol.* 1990 Apr;4(4):557-64. *PMID:2126344*
58. Schneyer AL, Mason AJ, Burton LE, Ziegner JR, **Crowley WF Jr.** Immunoreactive inhibin alpha-subunit in human serum: implications for radioimmunoassay. *J Clin Endocrinol Metab.* 1990 Apr;70(4):1208-12. *PMID:2318941*
59. Whitcomb RW, O'Dea LS, Finkelstein JS, Heavern DM, **Crowley WF Jr.** Utility of free alpha-subunit as an alternative neuroendocrine marker of gonadotropin-releasing hormone (GnRH) stimulation of the gonadotroph in the human: evidence from normal and GnRH-deficient men. *J Clin Endocrinol Metab.* 1990 Jun;70(6):1654-61. *PMID:1693373*
60. Bernstein JR, **Crowley WF Jr.**, Schneyer AL. An improved method of purifying inhibin radioligand for radioimmunoassay. *Biol Reprod.* 1990 Sep;43(3):492-6. *PMID:2271731*
61. Weiss J, Duca KA, **Crowley WF Jr.** Gonadotropin-releasing hormone-induced stimulation and desensitization of free alpha-subunit secretion mirrors luteinizing hormone and follicle-stimulating hormone in perfused rat pituitary cells. *Endocrinology.* 1990 Nov;127(5):2364-71. *PMID:2121462*
62. Martin K, Santoro N, Hall J, Filicori M, Wierman M, **Crowley WF.** Management of ovulatory disorders with pulsatile gonadotropin-releasing hormone. *J Clin Endocrinol Metab* 1990; 71:1081A-1081G.
63. Landy H, Boepple PA, Mansfield MJ, Charpie P, Schoenfeld DI, Link K, Romero G, Crawford JD, Crigler JF, Blizzard RM, **Crowley WF.** Sleep modulation of neuroendocrine function: developmental changes in gonadotropin-releasing hormone secretion during sexual maturation. *Pediatr Res* 1990; 28:213-17.
64. **Crowley WF Jr.**, Whitcomb RW, Jameson JL, Weiss J, Finkelstein JS, O'Dea LS. Neuroendocrine control of human reproduction in the male. *Recent Prog Horm Res.* 1991;47:27-62; discussion 62-7. *PMID:1745823*
65. Landy H, Boepple PA, Mansfield MJ, Whitcomb RW, Schneyer AL, Crawford JD, Crigler JF Jr, **Crowley WF Jr.** Altered patterns of pituitary secretion and renal excretion of free alpha-subunit during gonadotropin-releasing hormone agonist-induced pituitary desensitization. *J Clin Endocrinol Metab.* 1991 Mar;72(3):711-7. *PMID:1997524*
66. Schneyer AL, Sluss PM, Whitcomb RW, Hall JE, **Crowley WF Jr.**, Freeman RG. Development of a radioligand receptor assay for measuring follitropin in serum: application to premature ovarian failure. *Clin Chem.* 1991 Apr;37(4):508-14. *PMID:1901773*
67. Whalen RK, Whitcomb RW, **Crowley WF Jr.**, McGovern FJ. Priapism in hypogonadal men receiving gonadotropin releasing hormone. *J Urol.* 1991 May;145(5):1051-2. *PMID:2016792*

68. Hall JE, Bhatta N, Adams JM, Rivier JE, Vale WW, **Crowley WF Jr.** Variable tolerance of the developing follicle and corpus luteum to gonadotropin-releasing hormone antagonist-induced gonadotropin withdrawal in the human. *J Clin Endocrinol Metab.* 1991 May;72(5):993-1000. *PMID:1902489*
69. Finkelstein JS, Whitcomb RW, O'Dea LS, Longcope C, Schoenfeld DA, **Crowley WF Jr.** Sex steroid control of gonadotropin secretion in the human male. I. Effects of testosterone administration in normal and gonadotropin-releasing hormone-deficient men. *J Clin Endocrinol Metab.* 1991 Sep;73(3):609-20. *PMID: 1908484*
70. Finkelstein JS, O'Dea LS, Whitcomb RW, **Crowley WF Jr.** Sex steroid control of gonadotropin secretion in the human male. II. Effects of estradiol administration in normal and gonadotropin-releasing hormone-deficient men. *J Clin Endocrinol Metab.* 1991 Sep;73(3):621-8. *PMID:1908485*
71. Waldhauser F, Boepple PA, Schemper M, Mansfield MJ, **Crowley WF Jr.** Serum melatonin in central precocious puberty is lower than in age-matched prepubertal children. *J Clin Endocrinol Metab.* 1991 Oct;73(4):793-6. *PMID:1909703*
72. Schneyer AL, Sluss PM, Whitcomb RW, Martin KA, Sprengel R, **Crowley WF Jr.** Precursors of alpha-inhibin modulate follicle-stimulating hormone receptor binding and biological activity. *Endocrinology.* 1991 Oct;129(4):1987-99. *PMID:1915079*
73. Weiss J, Adams E, Whitcomb RW, **Crowley WF Jr.**, Jameson JL. Normal sequence of the gonadotropin-releasing hormone gene in patients with idiopathic hypogonadotropic hypogonadism. *Biol Reprod.* 1991 Nov;45(5):743-7 *PMID:1756212*
74. Weiss J, **Crowley WF Jr.**, Jameson JL. Pulsatile gonadotropin-releasing hormone modifies polyadenylation of gonadotropin subunit messenger ribonucleic acids. *Endocrinology.* 1992 Jan;130(1):415-20. *PMID:1345779*
75. Weiss J, Axelrod L, Whitcomb RW, Harris PE, **Crowley WF**, Jameson JL. Hypogonadism caused by a single amino acid substitution in the beta subunit of luteinizing hormone. *N Engl J Med.* 1992 Jan 16;326(3):179-83. *PMID:1727547*
76. Hall JE, Schoenfeld DA, Martin KA, **Crowley WF Jr.** Hypothalamic gonadotropin-releasing hormone secretion and follicle-stimulating hormone dynamics during the luteal-follicular transition. *J Clin Endocrinol Metab.* 1992 Mar;74(3):600-7. *PMID:1740493*
77. Oppenheim DS, Bikkal H, **Crowley WF Jr.**, Klibanski A. Effects of chronic GnRH analogue administration on gonadotrophin and alpha-subunit secretion in post-menopausal women. *Clin Endocrinol (Oxf).* 1992 Jun;36(6):559-64. *PMID:1385024*
78. Schneyer AL, O'Neil DA, **Crowley WF Jr.** Activin-binding proteins in human serum and follicular fluid. *J Clin Endocrinol Metab.* 1992 Jun;74(6):1320-4. *PMID:1592877*
79. Weiss J, Harris PE, Halvorson LM, **Crowley WF Jr.**, Jameson JL. Dynamic regulation of follicle-stimulating hormone-beta messenger ribonucleic acid levels by activin and gonadotropin-releasing hormone in perfused rat pituitary cells. *Endocrinology.* 1992 Sep;131(3):1403-8. *PMID:1505470*
80. Jay N, Mansfield MJ, Blizzard RM, **Crowley WF Jr.**, Schoenfeld D, Rhubin L, Boepple PA. Ovulation and menstrual function of adolescent girls with central precocious puberty after therapy with gonadotropin-releasing hormone agonists. *J Clin Endocrinol Metab.* 1992 Sep;75(3):890-4. *PMID:1517382*

81. Boepple PA, Frisch LS, Wierman ME, Hoffman WH, **Crowley WF Jr.** The natural history of autonomous gonadal function, adrenarche, and central puberty in gonadotropin-independent precocious puberty. *J Clin Endocrinol Metab.* 1992 Dec;75(6):1550-5. *PMID:1464663*
82. Weiss J, **Crowley WF Jr.**, Halvorson LM, Jameson JL. Perfusion of rat pituitary cells with gonadotropin-releasing hormone, activin, and inhibin reveals distinct effects on gonadotropin gene expression and secretion. *Endocrinology.* 1993 Jun;132(6):2307-11. *PMID:8504735*
83. Martin KA, Hall JE, Adams JM, **Crowley WF Jr.** Comparison of exogenous gonadotropins and pulsatile gonadotropin-releasing hormone for induction of ovulation in hypogonadotropic amenorrhea. *J Clin Endocrinol Metab.* 1993 Jul;77(1):125-9. *PMID:8325934*
84. Lambert-Messerlian GM, Isaacson K, **Crowley WF Jr.**, Sluss P, Schneyer AL. Human follicular fluid contains pro- and C-terminal immunoreactive alpha-inhibin precursor proteins. *J Clin Endocrinol Metab.* 1994 Feb;78(2):433-9. *PMID:7508950*
85. Albanese C, Christin-Maitre S, Sluss PM, **Crowley WF**, Jameson JL. Development of a bioassay for FSH using a recombinant human FSH receptor and a cAMP responsive luciferase reporter gene. *Mol Cell Endocrinol.* 1994 May;101(1-2):211-9. *PMID:9397955*
86. Mulder JE, Schneyer AL, Taylor AE, **Crowley WF**, Sluss PM. The species specificity of the recombinant human and rat follicle-stimulating hormone receptor are similar. *Endocrine Journal* 1994; 2:25-31.
87. Taylor AE, Khoury RH, **Crowley WF Jr.** A comparison of 13 different immunometric assay kits for gonadotropins: implications for clinical investigation. *J Clin Endocrinol Metab.* 1994 Jul;79(1):240-7 *PMID:8027235*
88. Lambert-Messerlian GM, Hall JE, Sluss PM, Taylor AE, Martin KA, Groome NP, **Crowley WF Jr.**, Schneyer AL. Relatively low levels of dimeric inhibin circulate in men and women with polycystic ovarian syndrome using a specific two-site enzyme-linked immunosorbent assay. *J Clin Endocrinol Metab.* 1994 Jul;79(1):45-50. *PMID:8027251*
89. Hall JE, Taylor AE, Martin KA, Rivier J, Schoenfeld DA, **Crowley WF Jr.** Decreased release of gonadotropin-releasing hormone during the preovulatory midcycle luteinizing hormone surge in normal women. *Proc Natl Acad Sci U S A.* 1994 Jul 19;91(15):6894-8. *PMID:8041716*
90. Callahan TL, Hall JE, Ettner SL, Christiansen CL, Greene MF, **Crowley WF Jr.** The economic impact of multiple-gestation pregnancies and the contribution of assisted-reproduction techniques to their incidence. *N Engl J Med.* 1994 Jul 28;331(4):244-9. *PMID:8015572*
91. Schneyer AL, Ruzicidlo DA, Sluss PM, **Crowley WF Jr.** Characterization of unique binding kinetics of follistatin and activin or inhibin in serum. *Endocrinology.* 1994 Aug;135(2):667-74. *PMID:8033815*
92. Adams JM, Taylor AE, Schoenfeld DA, **Crowley WF Jr.**, Hall JE. The midcycle gonadotropin surge in normal women occurs in the face of an unchanging gonadotropin-releasing hormone pulse frequency. *J Clin Endocrinol Metab.* 1994 Sep;79(3):858-64. *PMID:7521353*
93. Hall JE, Martin KA, Whitney HA, Landy H, **Crowley WF Jr.** Potential for fertility with replacement of hypothalamic gonadotropin-releasing hormone in long term female survivors of cranial tumors. *J Clin Endocrinol Metab.* 1994 Oct;79(4):1166-72. *PMID:7962290*
94. Weiss J, Cote CR, Jameson JL, **Crowley WF Jr.** Homologous desensitization of gonadotropin-releasing hormone (GnRH)-stimulated luteinizing hormone secretion in vitro occurs within the duration of an endogenous GnRH pulse. *Endocrinology.* 1995 Jan;136(1):138-43. *PMID:7828524*

95. Khoury RH, Wang QF, **Crowley WF Jr**, Hall JE, Schneyer AL, Toth T, Midgley AR Jr, Sluss PM. Serum follistatin levels in women: evidence against an endocrine function of ovarian follistatin. *J Clin Endocrinol Metab.* 1995 Apr;80(4):1361-8. *PMID:7714112*
96. Taylor AE, Whitney H, Hall JE, Martin K, **Crowley WF Jr**. Midcycle levels of sex steroids are sufficient to recreate the follicle-stimulating hormone but not the luteinizing hormone midcycle surge: evidence for the contribution of other ovarian factors to the surge in normal women. *J Clin Endocrinol Metab.* 1995 May;80(5):1541-7. *PMID:7744998*
97. Lambert-Messerlian GM, **Crowley WF Jr**, Schneyer AL. Extragonadal alpha-inhibin precursor proteins circulate in human male serum. *J Clin Endocrinol Metab.* 1995 Oct;80(10):3043-9. *PMID:7559894*
98. Pralong FP, Pavlou SN, Waldstreicher J, **Crowley WF Jr**, Boepple PA. Defective regulation of glycoprotein free alpha-subunit in males with isolated gonadotropin-releasing hormone deficiency--a clinical research center study. *J Clin Endocrinol Metab.* 1995 Dec;80(12):3682-8. *PMID:8530620*
99. Schneyer AL, Hall HA, Lambert-Messerlian G, Wang QF, Sluss P, **Crowley WF Jr**. Follistatin-activin complexes in human serum and follicular fluid differ immunologically and biochemically. *Endocrinology.* 1996 Jan;137(1):240-7. *PMID:8536619*
100. Albanese C, Colin IM, **Crowley WF**, Ito M, Pestell RG, Weiss J, Jameson JL. The gonadotropin genes: evolution of distinct mechanisms for hormonal control. *Recent Prog Horm Res.* 1996;51:23-58; discussion 59-61. *PMID:8701081*
101. Di Simone N, **Crowley WF Jr**, Wang QF, Sluss PM, Schneyer AL. Characterization of inhibin/activin subunit, follistatin, and activin type II receptors in human ovarian cancer cell lines: a potential role in autocrine growth regulation. *Endocrinology.* 1996 Feb;137(2):486-94. *PMID:8593793*
102. Wang QF, Khoury RH, Smith PC, McConnell DS, Padmanahban V, Midgley AR Jr, Schneyer AL, **Crowley WF Jr**, Sluss PM. A two-site monoclonal antibody immunoradiometric assay for human follistatin: secretion by a human ovarian teratocarcinoma-derived cell line (PA-1). *J Clin Endocrinol Metab.* 1996 Apr;81(4):1434-41. *PMID:8636347*
103. **Crowley W**, Thier S. Clinical investigation and the future of american health care: Solution-oriented considerations. *Academic Medicine* 1996; 71:1154-63.
104. Christin-Maitre S, Taylor AE, Khoury RH, Hall JE, Martin KA, Smith PC, Albanese C, Jameson JL, **Crowley WF Jr**, Sluss PM. Homologous in vitro bioassay for follicle-stimulating hormone (FSH) reveals increased FSH biological signal during the mid- to late luteal phase of the human menstrual cycle. *J Clin Endocrinol Metab.* 1996 Jun;81(6):2080-8. *PMID:8964832*
105. Habiby RL, Boepple P, Nachtigall L, Sluss PM, **Crowley WF Jr**, Jameson JL. Adrenal hypoplasia congenita with hypogonadotropic hypogonadism: evidence that DAX-1 mutations lead to combined hypothalamic and pituitary defects in gonadotropin production. *J Clin Invest.* 1996 Aug 15;98(4):1055-62. *PMID:8770879*
106. Pralong FP, Boepple PA, Conn PM, Whitcomb RW, Butler JP, Schoenfeld D, **Crowley WF Jr**. Contour of the GnRH pulse independently modulates gonadotropin secretion in the human male. *Neuroendocrinology.* 1996 Sep;64(3):247-56. *PMID:8875443*
107. Nachtigall LB, Boepple PA, Seminara SB, Khoury RH, Sluss PM, Lecain AE, **Crowley WF Jr**. Inhibin B secretion in males with gonadotropin-releasing hormone (GnRH) deficiency before and during long-term GnRH replacement: relationship to spontaneous puberty, testicular volume, and prior treatment--a clinical research center study. *J Clin Endocrinol Metab.* 1996 Oct;81(10):3520-5. *PMID:8855795*

108. Taylor AE, Adams JM, Mulder JE, Martin KA, Sluss PM, **Crowley WF Jr.** A randomized, controlled trial of estradiol replacement therapy in women with hypergonadotropic amenorrhea. *J Clin Endocrinol Metab.* 1996 Oct;81(10):3615-21. *PMID:8855811*
109. Seminara SB, Boepple PA, Nachtigall LB, Pralong FP, Khoury RH, Sluss PM, Lecain AE, **Crowley WF Jr.** Inhibin B in males with gonadotropin-releasing hormone (GnRH) deficiency: changes in serum concentration after short-term physiologic GnRH replacement--a clinical research center study. *J Clin Endocrinol Metab.* 1996 Oct;81(10):3692-6. *PMID:8855824*
110. Wang QF, Tilly KI, Tilly JL, Preffer F, Schneyer AL, **Crowley WF Jr.**, Sluss PM. Activin inhibits basal and androgen-stimulated proliferation and induces apoptosis in the human prostatic cancer cell line, LNCaP. *Endocrinology.* 1996 Dec;137(12):5476-83. *PMID:8940374*
111. Waldstreicher J, Seminara SB, Jameson JL, Geyer A, Nachtigall LB, Boepple PA, Holmes LB, **Crowley WF Jr.** The genetic and clinical heterogeneity of gonadotropin-releasing hormone deficiency in the human. *J Clin Endocrinol Metab.* 1996 Dec;81(12):4388-95. *PMID:8954047*
112. Georgopoulos NA, Pralong FP, Seidman CE, Seidman JG, **Crowley WF Jr.**, Vallejo M. Genetic heterogeneity evidenced by low incidence of KAL-1 gene mutations in sporadic cases of gonadotropin-releasing hormone deficiency. *J Clin Endocrinol Metab.* 1997 Jan;82(1):213-7. *PMID:8989261*
113. Nachtigall LB, Boepple PA, Pralong FP, **Crowley WF Jr.** Adult-onset idiopathic hypogonadotropic hypogonadism--a treatable form of male infertility. *N Engl J Med.* 1997 Feb 6;336(6):410-5. *PMID:9010147*
114. Kotlar TJ, Young RH, Albanese C, **Crowley WF Jr.**, Scully RE, Jameson JL. A mutation in the follicle-stimulating hormone receptor occurs frequently in human ovarian sex cord tumors. *J Clin Endocrinol Metab.* 1997 Apr;82(4):1020-6. *PMID:9100567*
115. Welt CK, Martin KA, Taylor AE, Lambert-Messerlian GM, **Crowley WF Jr.**, Smith JA, Schoenfeld DA, Hall JE. Frequency modulation of follicle-stimulating hormone (FSH) during the luteal-follicular transition: evidence for FSH control of inhibin B in normal women. *J Clin Endocrinol Metab.* 1997 Aug;82(8):2645-52. *PMID:9253348*
116. Welt CK, Lambert-Messerlian G, Zheng W, **Crowley WF Jr.**, Schneyer AL. Presence of activin, inhibin, and follistatin in epithelial ovarian carcinoma. *J Clin Endocrinol Metab.* 1997 Nov;82(11):3720-7. *PMID:9360531*
117. Lavoie HB, Martin KA, Taylor E, **Crowley WF.**, Hall JE. Exaggerated free alpha-subunit levels during pulsatile gonadotropin-releasing hormone replacement in women with idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab.* 1998 Jan;83(1):241-7. *PMID:9435449*
118. McConnell DS, Wang Q, Sluss PM, Bolf N, Khoury RH, Schneyer AL, Midgley AR Jr, Reame NE, **Crowley WF Jr.**, Padmanabhan V. A two-site chemiluminescent assay for activin-free follistatin reveals that most follistatin circulating in men and normal cycling women is in an activin-bound state. *J Clin Endocrinol Metab.* 1998 Mar;83(3):851-8. *PMID:9506739*
119. Martin KA, Welt CK, Taylor AE, Smith JA, **Crowley WF Jr.**, Hall JE. Is GnRH reduced at the midcycle surge in the human? Evidence from a GnRH-deficient model. *Neuroendocrinology.* 1998 Jun;67(6):363-9. *PMID:9662715*
120. Seminara SB, Hayes FJ, **Crowley WF Jr.** Gonadotropin-releasing hormone deficiency in the human (idiopathic hypogonadotropic hypogonadism and Kallmann's syndrome): pathophysiological and genetic considerations. *Endocr Rev.* 1998 Oct;19(5):521-39. *PMID:9793755*

121. Hall JE, Taylor AE, Hayes FJ, **Crowley WF Jr**. Insights into hypothalamic-pituitary dysfunction in polycystic ovary syndrome. *J Endocrinol Invest*. 1998 Oct;21(9):602-11. *PMID:9856414*
122. Seminara SB, Hall JE, Taylor AE, **Crowley WF Jr**, Martin KA. The Reproductive Endocrine Associates of the Massachusetts General Hospital: fifteen years of integrated clinical practice and investigation. *J Clin Endocrinol Metab*. 1999 Jun;84(6):1912-8. *PMID:10372686*
123. Fauser BC, Devroey P, Yen SS, Gosden R, **Crowley WF Jr**, Baird DT, Bouchard P. Minimal ovarian stimulation for IVF: appraisal of potential benefits and drawbacks. *Hum Reprod*. 1999 Nov;14(11):2681-6. *PMID:10548600*
124. Palmert MR, Mansfield MJ, **Crowley WF Jr**, Crigler JF Jr, Crawford JD, Boepple PA. Is obesity an outcome of gonadotropin-releasing hormone agonist administration? Analysis of growth and body composition in 110 patients with central precocious puberty. *J Clin Endocrinol Metab*. 1999 Dec;84(12):4480-8. *PMID:10599706*
125. Achermann JC, Gu WX, Kotlar TJ, Meeks JJ, Sabacan LP, Seminara SB, Habiby RL, Hindmarsh PC, Bick DP, Sherins RJ, **Crowley WF Jr**, Layman LC, Jameson JL. Mutational analysis of DAX1 in patients with hypogonadotropic hypogonadism or pubertal delay. *J Clin Endocrinol Metab*. 1999 Dec;84(12):4497-500. *PMID:10599708*
126. Seminara SB, Achermann JC, Genel M, Jameson JL, **Crowley WF Jr**. X-linked adrenal hypoplasia congenita: a mutation in DAX1 expands the phenotypic spectrum in males and females. *J Clin Endocrinol Metab*. 1999 Dec;84(12):4501-9. *PMID:10599709*
127. Seminara SB, Beranova M, Oliveira LM, Martin KA, **Crowley WF Jr**, Hall JE. Successful use of pulsatile gonadotropin-releasing hormone (GnRH) for ovulation induction and pregnancy in a patient with GnRH receptor mutations. *J Clin Endocrinol Metab*. 2000 Feb;85(2):556-62. *PMID:10690855*
128. Hayes FJ, Seminara SB, Decruz S, Boepple PA, **Crowley WF Jr**. Aromatase inhibition in the human male reveals a hypothalamic site of estrogen feedback. *J Clin Endocrinol Metab*. 2000 Sep;85(9):3027-35. *PMID:10999781*
129. Hayes FJ, DeCruz S, Seminara SB, Boepple PA, **Crowley WF Jr**. Differential regulation of gonadotropin secretion by testosterone in the human male: absence of a negative feedback effect of testosterone on follicle-stimulating hormone secretion. *J Clin Endocrinol Metab*. 2001 Jan;86(1):53-8. *PMID:11231978*
130. Oliveira LM, Seminara SB, Beranova M, Hayes FJ, Valkenburgh SB, Schipani E, Costa EM, Latronico AC, **Crowley WF Jr**, Vallejo M. The importance of autosomal genes in Kallmann syndrome: genotype-phenotype correlations and neuroendocrine characteristics. *J Clin Endocrinol Metab*. 2001 Apr;86(4):1532-8. *PMID:11297579*
131. Beranova M, Oliveira LM, Bédécarrats GY, Schipani E, Vallejo M, Ammini AC, Quintos JB, Hall JE, Martin KA, Hayes FJ, Pitteloud N, Kaiser UB, **Crowley WF Jr**, Seminara SB. Prevalence, phenotypic spectrum, and modes of inheritance of gonadotropin-releasing hormone receptor mutations in idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab*. 2001 Apr;86(4):1580-8. *PMID:11297587*
132. **Crowley WF Jr**, Thier SO. A program to facilitate clinical research in an AHC: the first five years. *Acad Med*. 2001 May;76(5):403-9. *PMID:11346512*
133. Pitteloud N, Boepple PA, DeCruz S, Valkenburgh SB, **Crowley WF Jr**, Hayes FJ. The fertile eunuch variant of idiopathic hypogonadotropic hypogonadism: spontaneous reversal associated with a homozygous mutation in the gonadotropin-releasing hormone receptor. *J Clin Endocrinol Metab*. 2001 Jun;86(6):2470-5. *PMID:11397842*

134. Oinonen MJ, **Crowley WF Jr**, Moskowitz J, Vlasses PH. How do academic health centers value and encourage clinical research? *Acad Med.* 2001 Jul;76(7):700-6. *PMID:11448823*
135. Palmert MR, Hayden DL, Mansfield MJ, Crigler JF Jr, **Crowley WF Jr**, Chandler DW, Boepple PA. The longitudinal study of adrenal maturation during gonadal suppression: evidence that adrenarche is a gradual process. *J Clin Endocrinol Metab.* 2001 Sep;86(9):4536-42. *PMID:11549704*
136. Hayes FJ, Pitteloud N, DeCruz S, **Crowley WF Jr**, Boepple PA. Importance of inhibin B in the regulation of FSH secretion in the human male. *J Clin Endocrinol Metab.* 2001 Nov;86(11):5541-6. *PMID:11701733*
137. Pitteloud N, Hayes FJ, Boepple PA, DeCruz S, Seminara SB, MacLaughlin DT, **Crowley WF Jr**. The role of prior pubertal development, biochemical markers of testicular maturation, and genetics in elucidating the phenotypic heterogeneity of idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab.* 2002 Jan;87(1):152-60. *PMID:11788640*
138. Seminara SB, Acierno JS Jr, Abdulwahid NA, **Crowley WF Jr**, Margolin DH. Hypogonadotropic hypogonadism and cerebellar ataxia: detailed phenotypic characterization of a large, extended kindred. *J Clin Endocrinol Metab.* 2002 Apr;87(4):1607-12. *PMID:11932290*
139. Seminara SB, **Crowley WF Jr**. Genetic approaches to unraveling reproductive disorders: examples of bedside to bench research in the genomic era. *Endocr Rev.* 2002 Jun;23(3):382-92. *PMID:12050127*
140. Taylor AE, Stubbs C, Singer DE, Curhan G, **Crowley WF Jr**. An instrument for determining the amount of NIH support for clinical investigations at one academic health center. *Acad Med.* 2002 Aug;77(8):824-30. *PMID:12176698*
141. Pitteloud N, Hayes FJ, Dwyer A, Boepple PA, Lee H, **Crowley WF Jr**. Predictors of outcome of long-term GnRH therapy in men with idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab.* 2002 Sep;87(9):4128-36. *PMID:12213860*
142. Gyurko R, Leupen SM, **Crowley WF Jr.**, Huang PL. Deletion of exon 6 of the neuronal nitric oxide synthase gene results in hypogonadism and infertility in mice. *Endocrinology.* 2002;143(7):2767-74.
143. Sung NS, **Crowley WF Jr**, Genel M, Salber P, Sandy L, Sherwood LM, Johnson SB, Catanese V, Tilson H, Getz K, Larson EL, Scheinberg D, Reece EA, Slavkin H, Dobs A, Grebb J, Martinez RA, Korn A, Rimoin D. Central challenges facing the national clinical research enterprise. *JAMA.* 2003 Mar 12;289(10):1278-87. *PMID:12633190*
144. **Crowley WF Jr**. Translation of basic research into useful treatments: how often does it occur? *Am J Med.* 2003 Apr 15;114(6):503-5. *PMID:12727585*
145. Bo-Abbas Y, Acierno JS Jr, Shagoury JK, **Crowley WF Jr**, Seminara SB. Autosomal recessive idiopathic hypogonadotropic hypogonadism: genetic analysis excludes mutations in the gonadotropin-releasing hormone (GnRH) and GnRH receptor genes. *J Clin Endocrinol Metab.* 2003 Jun;88(6):2730-7. *PMID:12788881*
146. Acierno JS Jr, Shagoury JK, Bo-Abbas Y, **Crowley WF Jr**, Seminara SB. A locus for autosomal recessive idiopathic hypogonadotropic hypogonadism on chromosome 19p13.3. *J Clin Endocrinol Metab.* 2003 Jun;88(6):2947-50. *PMID:12788910*
147. Leupen SM, Tobet SA, **Crowley WF Jr**, Kaila K. Heterogeneous expression of the potassium-chloride cotransporter KCC2 in gonadotropin-releasing hormone neurons of the adult mouse. *Endocrinology.* 2003 Jul;144(7):3031-6. *PMID:12810559*

148. Seminara SB, Messenger S, Chatzidaki EE, Thresher RR, Acierno JS Jr, Shagoury JK, Bo-Abbas Y, Kuohung W, Schwino KM, Hendrick AG, Zahn D, Dixon J, Kaiser UB, Slaugenhaupt SA, Gusella JF, O'Rahilly S, Carlton MB, **Crowley WF Jr**, Aparicio SA, Colledge WH. The GPR54 gene as a regulator of puberty. *N Engl J Med*. 2003 Oct 23;349(17):1614-27. *PMID:14573733*
149. **Crowley WF Jr**, Sherwood L, Salber P, Scheinberg D, Slavkin H, Tilson H, Reece EA, Catanese V, Johnson SB, Dobs A, Genel M, Korn A, Reame N, Bonow R, Grebb J, Rimoin D. Clinical research in the United States at a crossroads: proposal for a novel public-private partnership to establish a national clinical research enterprise. *JAMA*. 2004 Mar 3;291(9):1120-6. *PMID:14996782*
150. Pitteloud N, Villegas J, Dwyer AA, **Crowley WF Jr**, McPhaul MJ, Hayes FJ. Acute stress masking the biochemical phenotype of partial androgen insensitivity syndrome in a patient with a novel mutation in the androgen receptor. *J Clin Endocrinol Metab*. 2004 Mar;89(3):1053-8. *PMID:15001585*
151. Gottsch ML, Cunningham MJ, Smith JT, Popa SM, Acohido BV, **Crowley WF**, Seminara S, Clifton DK, Steiner RA. A role for kisspeptins in the regulation of gonadotropin secretion in the mouse. *Endocrinology*. 2004 Sep;145(9):4073-7. *PMID:15217982*
152. Meysing AU, Kanasaki H, Bedecarrats GY, Acierno JS Jr, Conn PM, Martin KA, Seminara SB, Hall JE, **Crowley WF Jr**, Kaiser UB. GNRHR mutations in a woman with idiopathic hypogonadotropic hypogonadism highlight the differential sensitivity of luteinizing hormone and follicle-stimulating hormone to gonadotropin-releasing hormone. *J Clin Endocrinol Metab*. 2004 Jul;89(7):3189-98. *PMID:15240592*
153. Adams JM, Taylor AE, **Crowley WF Jr**, Hall JE. Polycystic ovarian morphology with regular ovulatory cycles: insights into the pathophysiology of polycystic ovarian syndrome. *J Clin Endocrinol Metab*. 2004 Sep;89(9):4343-50. *PMID:15356031*
154. Pitteloud N, Acierno JS Jr, Meysing AU, Dwyer AA, Hayes FJ, **Crowley WF Jr**. Reversible kallmann syndrome, delayed puberty, and isolated anosmia occurring in a single family with a mutation in the fibroblast growth factor receptor 1 gene. *J Clin Endocrinol Metab*. 2005 Mar;90(3):1317-22. *PMID:15613419*
155. Shahab M, Mastronardi C, Seminara SB, **Crowley WF**, Ojeda SR, Plant TM. Increased hypothalamic GPR54 signaling: a potential mechanism for initiation of puberty in primates. *Proc Natl Acad Sci U S A*. 2005 Feb 8;102(6):2129-34. *PMID:15684075*
156. Turisco F, Keogh D, Stubbs C, Glaser J, **Crowley WF**. The current status of integrating information technologies into the clinical research enterprise within US academic health centers: strategic value and opportunities for investment. *J of Investigative Medicine* 2005;53:425-433.
157. Kumar PA, Pitteloud N, Andrews PA, Dwyer A, Hayes F, **Crowley WF Jr**, Dym M. Testis morphology in patients with idiopathic hypogonadotropic hypogonadism. *Hum Reprod*. 2006 Apr;21(4):1033-40. *PMID:16396935*
158. Seminara SB, Dipietro MJ, Ramaswamy S, **Crowley WF Jr**, Plant TM. Continuous human metastatin 45-54 infusion desensitizes G protein-coupled receptor 54-induced gonadotropin-releasing hormone release monitored indirectly in the juvenile male Rhesus monkey (*Macaca mulatta*): a finding with therapeutic implications. *Endocrinology*. 2006 May;147(5):2122-6. *PMID:16469799*
159. Pitteloud N, Acierno JS Jr, Meysing A, Eliseenkova AV, Ma J, Ibrahimi OA, Metzger DL, Hayes FJ, Dwyer AA, Hughes VA, Yialamas M, Hall JE, Grant E, Mohammadi M, **Crowley WF Jr**. Mutations in fibroblast

- growth factor receptor 1 cause both Kallmann syndrome and normosmic idiopathic hypogonadotropic hypogonadism. *Proc Natl Acad Sci U S A*. 2006 Apr 18;103(16):6281-6. *PMID:16606836*
160. Pallais JC, Bo-Abbas Y, Pitteloud N, **Crowley WF Jr**, Seminara SB. Neuroendocrine, gonadal, placental, and obstetric phenotypes in patients with IHH and mutations in the G-protein coupled receptor, GPR54. *Mol Cell Endocrinol*. 2006 Jul 25;254-255:70-7. *PMID:16757106*
161. Pitteloud N, Meysing A, Quinton R, Acierno JS Jr, Dwyer AA, Plummer L, Fliers E, Boepple P, Hayes F, Seminara S, Hughes VA, Ma J, Bouloux P, Mohammadi M, **Crowley WF Jr**. Mutations in fibroblast growth factor receptor 1 cause Kallmann syndrome with a wide spectrum of reproductive phenotypes. *Mol Cell Endocrinol*. 2006 Jul 25;254-255:60-9. *PMID:16764984*
162. Welt CK, Arason G, Gudmundsson JA, Adams J, Palsdóttir H, Gudlaugsdóttir G, Ingadóttir G, **Crowley WF**. Defining constant versus variable phenotypic features of women with polycystic ovary syndrome using different ethnic groups and populations. *J Clin Endocrinol Metab*. 2006 Nov;91(11):4361-8. *PMID:16940441*
163. Welt CK, Gudmundsson JA, Arason G, Adams J, Palsdottir H, Gudlaugsdottir G, Ingadottir G, **Crowley WF**. Characterizing discrete subsets of polycystic ovary syndrome as defined by the Rotterdam criteria: the impact of weight on phenotype and metabolic features. *J Clin Endocrinol Metab*. 2006 Dec;91(12):4842-8. *PMID:17003085*
164. Pitteloud N, Quinton R, Pearce S, Raivio T, Acierno J, Dwyer A, Plummer L, Hughes V, Seminara S, Cheng YZ, Li WP, Maccoll G, Eliseenkova AV, Olsen SK, Ibrahimi OA, Hayes FJ, Boepple P, Hall JE, Bouloux P, Mohammadi M, **Crowley W**. Digenic mutations account for variable phenotypes in idiopathic hypogonadotropic hypogonadism. *J Clin Invest*. 2007 Feb;117(2):457-63. *PMID: 17235395*
165. Ramaswamy S, Seminara SB, Pohl CR, DiPietro MJ, **Crowley WF Jr**, Plant TM. Effect of continuous intravenous administration of human metastin 45-54 on the neuroendocrine activity of the hypothalamic-pituitary-testicular axis in the adult male rhesus monkey (*Macaca mulatta*). *Endocrinology*. 2007 Jul;148(7):3364-70. *PMID:17412800*
166. Raivio T, Falardeau J, Dwyer A, Quinton R, Hayes FJ, Hughes VA, Cole LW, Pearce SH, Lee H, Boepple P, **Crowley WF Jr**, Pitteloud N. Reversal of idiopathic hypogonadotropic hypogonadism. *N Engl J Med*. 2007 Aug 30;357(9):863-73. *PMID:17761590*
167. Pitteloud N, Zhang C, Pignatelli D, Li JD, Raivio T, Cole LW, Plummer L, Jacobson-Dickman EE, Mellon PL, Zhou QY, **Crowley WF Jr**. Loss-of-function mutation in the prokineticin 2 gene causes Kallmann syndrome and normosmic idiopathic hypogonadotropic hypogonadism. *Proc Natl Acad Sci U S A*. 2007 Oct 30;104(44):17447-52. *PMID:17959774*
168. Sluss PM, Hayes FJ, Adams JM, Barnes W, Williams G, Frost S, Ramp J, Pacenti D, Lehotay DC, George S, Ramsay C, Doss RC, **Crowley WF Jr**. Mass spectrometric and physiological validation of a sensitive, automated, direct immunoassay for serum estradiol using the Architect. *Clin Chim Acta*. 2008 Feb;388(1-2):99-105. *PMID:18023274*
169. Hughes VA, Boepple PA, **Crowley WF Jr**, Seminara SB. Interplay between dose and frequency of GnRH administration in determining pituitary gonadotropin responsiveness. *Neuroendocrinology*. 2008;87(3):142-50. *PMID:18063854*
170. Pitteloud N, Dwyer AA, DeCruz S, Lee H, Boepple PA, **Crowley WF Jr**, Hayes FJ. Inhibition of luteinizing hormone secretion by testosterone in men requires aromatization for its pituitary but not its

- hypothalamic effects: evidence from the tandem study of normal and gonadotropin-releasing hormone-deficient men. *J Clin Endocrinol Metab.* 2008 Mar;93(3):784-91. *PMID:18073301*
171. Boepple PA, Hayes FJ, Dwyer AA, Raivio T, Lee H, **Crowley WF Jr**, Pitteloud N. Relative roles of inhibin B and sex steroids in the negative feedback regulation of follicle-stimulating hormone in men across the full spectrum of seminiferous epithelium function. *J Clin Endocrinol Metab.* 2008 May;93(5):1809-14. *PMID:18270253*
 172. Pitteloud N, Dwyer AA, DeCruz S, Lee H, Boepple PA, **Crowley WF Jr**, Hayes FJ. The relative role of gonadal sex steroids and gonadotropin-releasing hormone pulse frequency in the regulation of follicle-stimulating hormone secretion in men. *J Clin Endocrinol Metab.* 2008 Jul;93(7):2686-92. *PMID:18445673*
 173. DiLaura R, Turisco F, McGrew C, Reel S, Glaser J, **Crowley WF Jr**. Use of informatics and information technologies in the clinical research enterprise within US academic medical centers: progress and challenges from 2005 to 2007. *J Investig Med.* 2008 Jun;56(5):770-9. *PMID:18525452*
 174. Cole LW, Sidis Y, Zhang C, Quinton R, Plummer L, Pignatelli D, Hughes VA, Dwyer AA, Raivio T, Hayes FJ, Seminara SB, Huot C, Alos N, Speiser P, Takeshita A, Van Vliet G, Pearce S, **Crowley WF Jr**, Zhou QY, Pitteloud N. Mutations in prokineticin 2 and prokineticin receptor 2 genes in human gonadotrophin-releasing hormone deficiency: molecular genetics and clinical spectrum. *J Clin Endocrinol Metab.* 2008 Sep;93(9):3551-9. *PMID:18559922*
 175. Jongmans MC, van Ravenswaaij-Arts CM, Pitteloud N, Ogata T, Sato N, Claahsen-van der Grinten HL, van der Donk K, Seminara S, Bergman JE, Brunner HG, **Crowley WF Jr**, Hoefsloot LH. CHD7 mutations in patients initially diagnosed with Kallmann syndrome--the clinical overlap with CHARGE syndrome. *Clin Genet.* 2009 Jan;75(1):65-71. *PMID:19021638*
 176. Broder-Fingert S, Crowley WF Jr, Boepple PA. Safety of frequent venous blood sampling in a pediatric research population. *J Pediatr.* 2009 Apr;154(4):578-81. *PMID:19026428*
 177. Chan YM, de Guillebon A, Lang-Muritano M, Plummer L, Cerrato F, Tsiaras S, Gaspert A, Lavoie HB, Wu CH, **Crowley WF Jr**, Amory JK, Pitteloud N, Seminara SB. GNRH1 mutations in patients with idiopathic hypogonadotropic hypogonadism. *Proc Natl Acad Sci U S A.* 2009 Jul 14;106(28):11703-8. *PMID:19567835*
 178. Pitteloud N, Thambundit A, Dwyer AA, Falardeau JL, Plummer L, Caronia LM, Hayes FJ, Lee H, Boepple PA, **Crowley WF Jr**. Role of seminiferous tubular development in determining the FSH versus LH responsiveness to GnRH in early sexual maturation. *Neuroendocrinology.* 2009;90(3):260-8. *PMID:19829004*
 179. Gianetti E, Tusset C, Noel SD, Au MG, Dwyer AA, Hughes VA, Abreu AP, Carroll J, Trarbach E, Silveira LF, Costa EM, de Mendonça BB, de Castro M, Lofrano A, Hall JE, Bolu E, Ozata M, Quinton R, Amory JK, Stewart SE, Arlt W, Cole TR, **Crowley WF**, Kaiser UB, Latronico AC, Seminara SB. TAC3/TACR3 mutations reveal preferential activation of gonadotropin-releasing hormone release by neurokinin B in neonatal life followed by reversal in adulthood. *J Clin Endocrinol Metab.* 2010 Jun;95(6):2857-67. *PMID:20332248*
 180. Sykiotis GP, Hoang XH, Avbelj M, Hayes FJ, Thambundit A, Dwyer A, Au M, Plummer L, **Crowley WF Jr**, Pitteloud N. Congenital idiopathic hypogonadotropic hypogonadism: evidence of defects in the hypothalamus, pituitary, and testes. *J Clin Endocrinol Metab.* 2010 Jun;95(6):3019-27. *PMID:20382682*

181. Kuohung W, Burnett M, Mukhtyar D, Schuman E, Ni J, **Crowley WF**, Glicksman MA, Kaiser UB. A high-throughput small-molecule ligand screen targeted to agonists and antagonists of the G-protein-coupled receptor GPR54. *J Biomol Screen*. 2010 Jun;15(5):508-17. *PMID:20460252*
182. Dwyer AA, Hayes FJ, Plummer L, Pitteloud N, **Crowley WF Jr**. The long-term clinical follow-up and natural history of men with adult-onset idiopathic hypogonadotropic hypogonadism. *J Clin Endocrinol Metab*. 2010 Sep;95(9):4235-43. *PMID:20591981*
183. Sykiotis GP, Plummer L, Hughes VA, Au M, Durrani S, Nayak-Young S, Dwyer AA, Quinton R, Hall JE, Gusella JF, Seminara SB, **Crowley WF Jr**, Pitteloud N. Oligogenic basis of isolated gonadotropin-releasing hormone deficiency. *Proc Natl Acad Sci U S A*. 2010 Aug 24;107(34):15140-4. *PMID:20696889*
184. Shaw ND, Seminara SB, Welt CK, Au MG, Plummer L, Hughes VA, Dwyer AA, Martin KA, Quinton R, Mericq V, Merino PM, Gusella JF, **Crowley WF Jr**, Pitteloud N, Hall JE. Expanding the phenotype and genotype of female GnRH deficiency. *Endocrinology*. 2011 Feb;152(2):743. *PMID: 21209029*
185. Caronia LM, Martin C, Welt CK, Sykiotis GP, Quinton R, Thambundit A, Avbelj M, Dhruvakumar S, Plummer L, Hughes VA, Seminara SB, Boepple PA, Sidis Y, **Crowley WF Jr**, Martin KA, Hall JE, Pitteloud N. A genetic basis for functional hypothalamic amenorrhea. *N Engl J Med*. 2011 Jan 20;364(3):215-25. *PMID:21247312*
186. Chan YM, Butler JP, Pinnell NE, Pralong FP, **Crowley WF Jr**, Ren C, Chan KK, Seminara SB. Kisspeptin resets the hypothalamic GnRH clock in men. *J Clin Endocrinol Metab*. 2011 Jun;96(6):E908-15. Epub 2011 Apr 6. *PMID:21470997*
187. Au MG, **Crowley WF Jr**, Buck CL. Genetic Counseling for Isolated GnRH Deficiency. *Mol Cell Endocrinol*. 2011 Oct. 22; 346 (1-2):102-9. doi: 10.1016/j.mce.2011.05.041. Epub 2011 Jun 1. Review. PubMed PMID: 21664415; PubMed Central PMCID: PMC3185214
188. Tornberg J, Sykiotis GP, Keefe K, Plummer L, Hoang X, Hall JE, Quinton R, Seminara SB, Hughes V, Van Vliet G, Van Uum S, **Crowley WF**, Habuchi H, Kimata K, Pitteloud N, Bülow HE. Heparan sulfate 6-O-sulfotransferase 1, a gene involved in extracellular sugar modifications, is mutated in patients with idiopathic hypogonadotropic hypogonadism. *Proc Natl Acad Sci U S A*. 2011 Jul 12;108(28):11524-9. Epub 2011 Jun 23. *PMID:21700882*
189. Balasubramanian R, **Crowley WF**. Isolated GnRH Deficiency: A Disease Model Serving as a Unique Prism into the Systems Biology of the GnRH Neuronal Network. *Mol Cell Endocrinol*. 2011 Oct 22;346(1-2):4-12. Epub 2011 Jul 12. *PMID: 21782888*
190. Yee-Ming Chan, Sarabeth Broder-Fingert, Sophia Paraschos, Risto Lapatto, Margaret Au, Virginia Hughes, Suzy D. C. Bianco, Le Min, Lacey Plummer, Felecia Cerrato, Adelaide De Guillebon, I-Hsuan Wu, Fazal Wahab, Andrew Dwyer, Susan Kirsch, Richard Quinton, Timothy Cheetham, Metin Ozata, Svetlana Ten, Jean-Pierre Chanoine, Nelly Pitteloud, **William F. Crowley, Jr.**, Kathryn A. Martin, Raphael Schiffmann, Hetty J. Van der Kamp, Shahla Nader, Janet E. Hall, Ursula B. Kaiser, and Stephanie B. Seminara. GnRH-Deficiency Phenotypes in Humans and Mice with Heterozygous Variants in *KISS1/Kiss1*. *J Clin Endocrine Metab*. Nov 2011, 96(11).
191. Lewkowitz-Shpuntoff HM, Hughes VA, Plummer L, Au MG, Doty RL, Seminara SB, Chan YM, Pitteloud N, **Crowley WF Jr**, Balasubramanian R. Olfactory Phenotypic Spectrum in Idiopathic Hypogonadotropic Hypogonadism: Pathophysiological and Genetic Implications. 2012 Jan;97(1):E136-44. *PMID: 22072740*

192. Welt CK, Styrkarsdottir U, Ehrmann DA, Thorleifsson G, Arason G, Gudmundsson JA, Ober C, Rosenfield RL, Saxena R, Thorsteinsdottir U, **Crowley WF**, Stefansson K. Variants in DENND1A Are Associated with Polycystic Ovary Syndrome in Women of European Ancestry. *J Clin Endocrinol Metab.* 2012 Apr 30. [Epub ahead of print] *PMID:22547425*
193. Gianetti E, Hall JE, Au MG, Kaiser UB, Quinton R, Stewart JA, Metzger DL, Pitteloud N, Mericq V, Merino PM, Levitsky LL, Izatt L, Lang-Muritano M, Fujimoto VY, Dluhy RG, Chase ML, **Crowley WF Jr**, Plummer L, Seminara SB. When Genetic Load Does Not Correlate with Phenotypic Spectrum: Lessons from the GnRH Receptor (GNRHR). *J Clin Endocrinol Metab.* 2012 Jun 28. [Epub ahead of print] *PMID: 22745237*
194. Avbelj M, Jeanpierre M, Sykiotis GP, Young J, Quinton R, Abreu AP, Plummer L, Au MG, Balasubramanian R, Dwyer AA, Florez JC, Cheetham T, Pearce SH, Purushothaman R, Schinzel A, Pugeat M, Jacobson-Dickman EE, Ten S, Latronico AC, Gusella JF, Dode C, **Crowley WF Jr.**, Pitteloud N. "An Ancient Founder Mutation in *PROKR2* Impairs Human Reproduction. *Hum Mol Genet.* 2012 Oct. 1:21(19):4314-24. doi: 10.1093/hmg/dds264. Epub 2312 JUL 5 *PMID: 22773735;PubMed Central*
195. Gallin EK, Bond E, Califf RM, **Crowley WF Jr.**, Davis P, Galbraith R, Reece A. "Forging Stronger Partnerships between Academic Health Centers and Patient-Driven Organizations." *Acad Med.* 2013 Sep; 88(9): 1220-4. doi: 10.1097/ACM.0b013e31829ed2a7; *PMID: 23887007*
196. Andrew A. Dwyer, Gerasimos P. Sykiotis, Frances J. Hayes, Paul A. Boepple, Hang Lee, Kevin R. Loughlin, Martin Dym, Patrick M. Sluss, **William F. Crowley, Jr.**, Nelly Pitteloud. "Trial of Recombinant Follicle-Stimulating Hormone Pretreatment for GnRH-Induces Fertility in Patients with Congenital Hypogonadotropic Hypogonadism. *JCEM June 13, 2013, PMID: 24037890,*
197. Hichem Miraoui, Andrew A. Dwyer, Gerasimos P. Sykiotis, Lacey Plummer, Wilson Chung, Bihua Feng, Andrew Beenken, Jeff Clarke, Tune H. Pers, Piotr Dworzynski, Kimberley Keefe, Marek Niedziela, Taneli Raivio, **William F. Crowley, Jr.**, Stephanie Seminara, Richard Quinton, Guy Van Vliet, Jean-Pierre Chanione, John Rubenstein, Moosa Mohammadi, Pei-San Tsai, Yisrael Sidis, Kasper Lage, Nelly Pitteloud " Mutations in FGF17, IL17RD, DUSP6, SPRY4, and FLRT3 Are Identified in Individuals with Congenital Hypogonadotropic Hypogonadism" *The American Journal of Human Genetics May 2, 2013; PMID: 23643382,*
198. Flavia Amanda Costa-Barbosa, Ravikumar Balasubramanian, Kimberly W. Keefe, Natalie D. Shaw, Nada Al-Tassan, Lacey Plummer, Andrew A. Dwyer, Cassandra L. Buck, Jin-Ho Choi, Stephanie B. Seminara, Richard Quinton, Dorota Monies, Brian Meyer, Janet E. Hall, Nelly Pitteloud, **William F. Crowley, Jr.**, " Prioritizing Genetic Testing in Patients With Kallman Syndrome Using Clinical Phenotypes" *JCEM, March 2013, PMID: 2352238,*
199. Sheena Chew, Ravikumar Balasubramanian, Wai-Man Chan, Peter B. Kang, Caroline Andrews, Bryn D. Webb, Sarah E. MacKinnon, Darren T. Oystreck, Jessica Rankin, Thomas C. Crawford, Michael Geraghty, Scott Pomeroy, **William F. Crowley, Jr.**, Ethylin Wang Jabs, David G. Hunter, Patricia E. Grant, Elizabeth C. Engle " A novel syndrome caused by the E410K amino acid substitution in the neuronal P-tubulin isotype 3" *Brain A Journal of Neurology 2013 PMID: 23378218,*
200. Brent S. Abel, Natalie D. Shaw, Jenifer M. Brown, Judith M. Adams, Teresa Alati, Kathryn A. Martin, Nelly Pitteloud, Stephanie B. Seminara, Lacey Plummer, Duarte Pignatelli, **William F. Crowley, Jr.**, Corrine K. Welt, Janet E. Hall " Responsiveness to a Physiological Regimen of GnRH Therapy and Relation to Genotype in Women With Isolated Hypogonadotropic Hypogonadism" *JCEM – January 2013 PMID: 23341491,*

201. Balasubramanian R, Cohen DA, Klerman EB, Pignatelli D, Hall JE, Dwyer AA, Czeisler CA, Pitteloud N, **Crowley WF Jr.** Absence of Central Circadian Pacemaker Abnormalities in Humans With Loss of Function Mutation in Prokineticin 2. *J Clin Endocrinol Metab.* 2014 Jan 1;jc20132096.
202. Salian-Mehta S, Xu M, Knox AJ, Plummer L, Slavov D, Taylor M, Bevers S, Hodges RS, **Crowley, WF Jr.**, Wierman ME. Functional Consequences of AXL Sequence Variants in Idiopathic Hypogonadotropic Hypogonadism. *J Clin Endocrinol Metab.* 2014 Apr;99(4):1452-60. *PMID 24476074*
203. Balasubramanian R, Choi JH, Francescatto L, Willer J, Horton ER, Asimacopoulos EP, Stankovic KM, Plummer L, Buck CL, Quinton R, Nebesio TD, Mericq V, Merino PM, Meyer BF, Monies D, Gusella JF, Al Tassan N, Katsanis N, **Crowley WF Jr.** Functionally compromised CHD7 alleles in patients with Isolated GnRH Deficiency. *Proc Natl Acad Sci U S A.* 2014 Dec 16 111(50):17953-8. *PMID 25472840*
204. Choi JH, Balasubramanian R, Lee PH, Shaw N, Hall J, Plummer L, Buck C, Kottler ML, Jarzabek K, Wołczynski S, Quinton R, Latronico AC, Dode C, Ogata T, Kim H-G, Layman LC, Gusella JF, **Crowley WF Jr.** Expanding the Spectrum of Founder Mutations Causing Isolated Gonadotropin-Releasing Hormone Deficiency. *J. Clin. Endocrinol. Metab* 2015 Oct;100(10):E1378-85. doi: 10.1210/jc.2015-2262. Epub 2015 Jul 24. PubMed PMID: 26207952; PubMed Central PMCID: PMC4596034.
205. Stamou MI, Cox KH, **Crowley WF.** Discovering Genes Essential to the Hypothalamic Regulation of Human Reproduction Using a Human Disease Model. *Adjusting to Life in the “-Omics” Era.* *Endocr Rev.* 2016 Feb: 2016(1):4-22. *PMID 27454361.*
206. Kimball AB, Javorsky E, Ron ES, **Crowley WF Jr,** Langer R A Novel Approach to Administration of Peptides in Women: Systemic Absorption of a GnRH agonist via Transvaginal Ring Delivery System *J Control Release* 2016 Jul 10:233:19-28, *PMID: 27130696*
207. Shaw ND, Brand H, Kupchinsky ZA, Bengani H, Plummer L, Jones TI, Erdin S, Williamson KA, Rainger J, Stortchevoi A, Samocha K, Currall BB, Dunican DS, Collins RL, Willer JR, Lek A, Lek M, Nassan M, Pereira S, Kammin T, Lucente D, Silva A, Seabra CM, Chiang C, An Y, Ansari M, Rainger JK, Joss S, Smith JC, Lippincott MF, Singh SS, Patel N, Jing JW, Law JR, Ferraro N, Verloes A, Rauch A, Steindl K, Zweier M, Scheer I, Sato D, Okamoto N, Jacobsen C, Tryggestad J, Chernausek S, Schimmenti LA, Bresseur B, Cesaretti C, García-Ortiz JE, Buitrago TP, Silva OP, Hoffman JD, Mühlbauer W, Ruprecht KW, Loeyls BL, Shino M, Kaindl AM, Cho CH, Morton CC, Meehan RR, van Heyningen V, Liao EC, Balasubramanian R, Hall JE, Seminara SB, Macarthur D, Moore SA, Yoshiura KI, Gusella JF, Marsh JA, Graham JM Jr, Lin AE, Katsanis N, Jones PL, **Crowley WF Jr,** Davis EE, FitzPatrick DR, Talkowski ME. Corrigendum: SMCHD1 mutations associated with a rare muscular dystrophy can also cause isolated arhinia and Bosma arhinia microphthalmia syndrome. *Nat Genet.* 2017 May 26;49(6):969. *PMID: 28546579.*
208. Erica E. Davis; Ravikumar Balasubramanian; Zachary A Kupchinsky; David Keefe; Lacey Plummer; Blazej Meczekaski; Karen Heath; Vanesa Lopez-Gonzalez; Mary Ballesta-Martinez; Gomathi Margabanthu; Susan Price; James Greening; Margaret Wierman; **William F. Crowley;** Nicholas Katsanis. Loss of function mutations in TCF12 cause autosomal dominant Kallmann Syndrome and reveal network-level interactions between causal loci. Submitted to *Nature Communications.*
209. Ravikumar Balasubramanian; **William F. Crowley, Jr.** Reproductive endocrine phenotypes relating to CHD7 mutations in humans. *Am J Med Genet Part C Semin Med Genet.* 2017; 175C:507-515. Doi:101002;ajmg.c.31585
210. Kimberly H. Cox, Luciana M.B. Oliveira, Lacey Plummer, Braden Corbin, Thomas Gardella, Ravikumar Balasubramanian, and **William F. Crowley.** Modeling mutant/wild-type interactions to ascertain

pathogenicity of PROKR2 missense variants in patients with isolated GnRH deficiency. *Human Molecular Genetics*, 2017, Vol. 0, No. 0, 1-13. DOI 10.1093/hmg/ddx404

Non-peer reviewed scientific or medical publications/materials in print or other media

Proceedings of meetings or other non-peer reviewed research publications

1. Santoro N, **Crowley WF**. Disorders of endogenous GnRH secretion: hypogonadotropic hypogonadism, polycystic ovarian disease, inadequate luteal phase. In: Bennink HJTC, Dogterom A, Lappohn RE, Rolland R, Schoemaker J, eds. Pulsatile GnRH 1985. Proceedings of the 3rd Ferring Symposium; Haarlem: The Netherlands.
2. Filicori M, Spratt DI, Flamigni C, **Crowley WF**. Cronobiologia dell'asse endocrino riproduttivo maschile: fisiologia, diagnostica e terapia. Proceedings of the Italian Andrology Society. *Acta Medica Edizioni e Congressi*, 1987:15-22.
3. Boepple PA, Mansfield MJ, Crawford JD, Crigler JF Jr, Link K, Blizzard RM, **Crowley WF**. Growth patterns and skeletal maturation during sex steroid suppression and reactivation in central precocious puberty. Presented at International Symposium on GnRH Analogues, Geneva, Switzerland, 18-20 February 1988.
4. Crowley WF. Commentary: The Year in Endocrine Genetics for Basic Scientists. Presented at the 2011 Endocrine Society (ENDO) Annual Meeting, Boston, MA *Mol Endocrinol*. 2011 Dec;25(12):1989-2002. Epub 2011 Nov 22. *PMID: 22108799*
5. **Crowley, WF**. Genetic insights about how the brain controls human reproduction: use of the human disease model of isolated gonadotropin-releasing hormone deficiency (IGD). In IBSA Foundation Papers for Scientific Research. In: IPSA Foundation for scientific research VIII Forum, 2015 July 3; Siena. Rome: Per corsi Editoriali of Carocci Publisher. Session 2, Stress, inflammation, and reproduction; p33-41

Reviews, chapters, monographs and editorials

1. **Crowley WF**. Disorders of the male reproductive endocrine system. In: Altman PL, Katz DD, eds. *Human health and disease*. Bethesda, MD: Federation of American Societies for Experimental Biology, 1977:336-9.
2. **Crowley WF**, Axelrod L. Androgens. In: Miller RR, Greenblatt D, eds. *Handbook of Drug Therapy*. North Holland, New York: Elsevier, 1979; 841-59.
3. **Crowley WF**, Naftolin F. LH-RH: Overview of its past contributions, present limitations, and future potential. In: Conference on LRF testing. New York: Masson Publishing USA, Inc., 1980:341-7.
4. **Crowley WF Jr**. Development of a male contraceptive--a beginning. *N Engl J Med*. 1981 Sep 17;305(12):695-6. *PMID: 6267465*
5. **Crowley WF**, Vale WW, Rivier J, McArthur JW. LHRH in hypogonadotropic hypogonadism. In: Zatuchini GI, Shelton JD, Sciarra JJ, eds. *LHRH peptides as female and male contraceptives. PARFR series on fertility regulation*. Philadelphia: Harper & Row, 1981:321-33.

6. **Crowley WF**, McArthur JW. Pulsatile administration of luteinizing hormone-releasing hormone via a portable infusion pump to induce ovulation: a physiologic approach. In: Flamigni C, Givens JR, eds. *The Gonadotropins: basic science and clinical aspects in females*. London: Academic Press, 1982:457-69.
7. Cutler GB, Comite F, Rivier J, Vale W, Loriaux DL, **Crowley WF**. Pituitary desensitization with a long-acting luteinizing hormone-releasing hormone (LHRH) analogue: a potential new treatment for idiopathic precocious puberty. In: Brooks-Gunn J, Peterson A, eds. *Girls at puberty: biologic and psychosocial perspectives*. New York: Plenum Publishing Corporation, 1982:89-102.
8. Hoffman AR, **Crowley WF**. Induction of puberty with chronic administration of low-dose pulsatile GnRH. In: *Brain and Pituitary Peptides II*. Basel: Karger, 1983:140-9.
9. Filicori M, **Crowley WF**. Hypothalamic regulation of gonadotropin secretion in women. In: *Neuroendocrine Aspects of Reproduction*. New York: Academic Press, 1983:285-94.
10. **Crowley WF**. Le traitement de la puberte precoce d'origine centrale par un analogue retard du L.H.R.H. Action sur la croissance et al maturation osseuse apres un traitement de 18 mois. In: *Actualites Gynecologiques, Quatorzieme seri*. Paris: Masson Publishing, 1983:219-29.
11. Hoffman AR, **Crowley WF**. Chronic low-dose pulsatile GnRH treatment of idiopathic hypogonadotropic hypogonadism in men. In: D'Agata R, Lipsett MB, Polosa P, van der Molen HJ, eds. *Recent advances in male reproduction: molecular basis and clinical implications*. Raven Press, Volume 7, 1983:249-56.
12. **Crowley WF Jr**. An overview of LHRH and its analogues: clinical uses. *Ups J Med Sci*. 1984;89(1):3-12. *PMID: 6377638*
13. Hoffman AR, **Crowley WF**. Chronic administration of low-dose pulsatile GnRH in idiopathic hypogonadotropic hypogonadism. In: Givens JR, ed. *The hypothalamus in health and disease: reproduction, growth, feeding and behavior*. Memphis, TN: Year Book Medical Publishers, 1984:205-14.
14. Filicori M, **Crowley WF Jr**. The study of GnRH control of reproductive function. *Ups J Med Sci*. 1984;89(1):13-8. *PMID: 6429916*
15. Conn PM, Hsueh AJ, **Crowley WF Jr**. Gonadotropin-releasing hormone: molecular and cell biology, physiology, and clinical applications. *Fed Proc*. 1984 Jun;43(9):2351-61. *PMID: 6327393*
16. Brodie T, **Crowley WF**. Neuroendocrine control of reproduction and its manipulation with LHRH and its analogs. *Trends in Neurosciences* 1984; 7:340-4.
17. Hoffman AR, **Crowley WF**. LHRH therapy for hypogonadotropic-hypogonadal men. In: Vickery BH, Nestor JJ, Hafez ESE, eds. *LHRH and its analogues -- contraceptive and therapeutic agents*. Lancaster: MTP Press, 1984:285-97.
18. Spratt DI, Hoffman AR, **Crowley WF**. Hypogonadotropic hypogonadism and its treatment. In: Santen RJ, Swerdloff RS, eds. *Male sexual dysfunction*. New York: Marcel Dekker, Inc., 1985:227-49.
19. Brodie TD, **Crowley WF Jr**. Neuroendocrine control of reproduction and its therapeutic manipulation with GnRH and its analogs. *Int J Fertil*. 1985;30(1):66-70, 74-5. *PMID: 2862122*
20. Spratt DI, **Crowley WF**. Hypogonadotropic Hypogonadism: GnRH Therapy. In: Krieger DT, Bardin CW, eds. *Current therapy in endocrinology and metabolism 1985-1986*. B. C. Decker Inc., 1985:155-9.
21. **Crowley WF Jr**, Filicori M, Spratt DI, Santoro NF. The physiology of gonadotropin-releasing hormone (GnRH) secretion in men and women. *Recent Prog Horm Res*. 1985;41:473-531. *PMID: 3931190*

22. Filicori M, Flamigni C, **Crowley WF**. Influence of blood sampling frequency on gonadotropin pulse identification. In: Wagner TOF, ed. Pulsatile LHRH therapy of the male. Germany: TM-Verlag, 1985: 11-14/27-31.
23. **Crowley WF**, Spratt D. The results of long-term GnRH administration in idiopathic hypogonadotropic hypogonadism. In: Wagner TOF, ed. Pulsatile LHRH therapy of the male. Germany: TM-Verlag, 1985:69-73.
24. Filicori M, Campaniello E, Pareschi A, Flamigni C, **Crowley WF**. Actions of gonadal steroids upon the hypothalamic-pituitary axis. In: Wagner TOF, ed. Pulsatile LHRH therapy of the male. Germany: TM-Verlag; 1985:33-8.
25. Wierman ME, **Crowley WF**. Neuroendocrine control of the onset of puberty. In: Tanner JM, ed. Human growth: a comprehensive treatise. Plenum Press, 1986; 225-38.
26. Filicori M, Flamigni C, Vizziello G, Dalpiaz C, Ferrari P, Flaminia R, Santoro N, **Crowley WF Jr**. Hypothalamic control of gonadotropin secretion in the human menstrual cycle. *Prog Clin Biol Res*. 1986;225:55-74. *PMID:3097677*
27. Santoro N, Filicori M, Spratt D, **Crowley WF Jr**. Gonadotropin-releasing hormone (GnRH) physiology in men and women. *Acta Med Hung*. 1986;43(2):201-21. *PMID:3295743*
28. Boepple PA, Mansfield MJ, Wierman ME, Rudlin CR, Bode HH, Crigler JF Jr, Crawford JD, **Crowley WF Jr**. Use of a potent, long acting agonist of gonadotropin-releasing hormone in the treatment of precocious puberty. *Endocr Rev*. 1986 Feb;7(1):24-33. *PMID:2937629*
29. Santoro N, Filicori M, **Crowley WF Jr**. Hypogonadotropic disorders in men and women: diagnosis and therapy with pulsatile gonadotropin-releasing hormone. *Endocr Rev*. 1986 Feb;7(1):11-23. *PMID:3082615*
30. **Crowley WF Jr**. Progesterone antagonism: science and society. *N Engl J Med*. 1986 Dec 18;315(25):1607-8. *PMID:3785326*
31. **Crowley WF Jr**, Filicori M, Santoro N, Spratt D. Approaches to the study of GnRH in humans: implications for design of effective therapies. *Ann N Y Acad Sci*. 1987;519:269-86. *PMID:3129975*
32. Santoro N, Wierman ME, Filicori M, Waldstreicher J, **Crowley WF**. The physiology of GnRH in the female: effects of the dose of GnRH upon the pituitary and gonadal responses during induction of ovulation. In: Wagner TOF, Filicori M, eds. Episodic hormone secretion. Germany: T. M. Verlag, 1987; 207-17.
33. Finkelstein JS, **Crowley WF**. Reversal of hypogonadotropic hypogonadism with long-term hypothalamic replacement therapy. In: Wagner TOF, Filicori M, eds. Episodic hormone secretion. Germany: T. M. Verlag, 1987; 189-195.
34. Filicori M, Santoro N, **Crowley WF**. Pulsatile gonadotropin secretion in the normal menstrual cycle. In: Wagner TOF, Filicori M, eds. Episodic hormone secretion: from basic science to clinical application. Germany: TM-Verlag, 1987:141-6.
35. Filicori M, **Crowley WF**. Episodic progesterone secretion from the human corpus luteum. In: Wagner TOF, Filicori M, eds. Episodic hormone secretion: from basic science to clinical application. Germany: TM-Verlag, 1987:157-62.

36. Filicori M, Flamigni C, Campaniello E, Pareschi A, Dalpiaz C, Ferrari P, Fabbri R, Santoro N, **Crowley WF**. Abnormal pulsatile gonadotropin secretion in women. In: Wagner TOF, Filicori M, eds. *Episodic hormone secretion: from basic science to clinical application*. Germany: TM-Verlag, 1987:163-8.
37. Comite F, Gay KK, **Crowley WF**, Rivier J, Vale WW, Loriaux DL, Cutler GB. Luteinizing hormone-releasing hormone (LHRH) analogue therapy of true precocious puberty. In: Grumbach MM, Sizonenko PC, eds. *2nd International Congress on the Control of the Onset of Puberty*. New York: Academic Press, 1987.
38. Veldhuis JD, Clifton DK, **Crowley WF**, Filicori M, Johnson ML, Maciel RJ, Merriam GR, Santoro NS, Steiner RA, Santen RJ. Preferred attributes of objective pulse analysis methods. (Chapter 8) In: *The Episodic Secretion of Hormones*, Crowley WF and Hofler JG (eds), New York; Churchill Livingstone, 1987, pp 111-8.
39. **Crowley WF**, Filicori M, Santoro NF. GnRH secretion across the normal menstrual cycle. (Chapter 15) In: *The Episodic Secretion of Hormones*, Crowley WF and Hofler JG (eds), New York; Churchill Livingstone, 1987, pp 219-32.
40. Santoro N, Filicori M, Wierman M, Hall J, **Crowley WF**. Hypogonadotropic hypogonadism in women. (Chapter 17) In: *The Episodic Secretion of Hormones*, Crowley WF and Hofler JG (eds), New York; Churchill Livingstone, 1987, pp 247-56.
41. Spratt DI, Carr DB, Merriam GR, **Crowley WF**. Luteinizing hormone secretory patterns in men with idiopathic hypogonadotropic hypogonadism. (Chapter 18) In: *The Episodic Secretion of Hormones*, Crowley WF and Hofler JG (eds), New York; Churchill Livingstone, 1987, pp 257-66.
42. Boepple PA, Mansfield MJ, Crawford JD, Crigler JF, Link K, Blizzard RM, **Crowley WF**. The effects of gonadal steroids and their reversible suppression on statural growth and skeletal maturation in girls with central precocious puberty. (Chapter 20) In: *Disorders of Human Growth: Advances in Research and Treatment*, Grave G, and Cassorla F, (eds); Charles C. Thomas, Springfield, IL, 1988, pp 312-28.
43. Flamigni C, Ferrari P, Michelacci L, Campaniello E, Pareschi A, Santoro N, **Crowley WF**, Filicori M. Deranged pulsatile gonadotropin secretion and anovulation: diagnosis and GnRH therapy. In: Pancheri P, Zichella L, eds. *Male sexual dysfunction. Biorhythms and stress in the physiopathology of reproduction*. Washington DC: Hemisphere Publishing Corp. 1988:315-27.
44. **Crowley WF**, Filicori M, Santoro N, Spratt D. Approaches to the study of GnRH in humans: implications for design of effective therapies. In: Demski LS, Schwanzel-Fukuda M (eds), *The terminal nerve*. New York Academy Sciences 1988; 519:269-86.
45. Spratt DI, **Crowley WF**. Hypogonadotropic hypogonadism with gonadotropin-releasing hormone. In: Amelar RD, Dubin L, eds. *Current therapy of infertility - 3*. Canada: B. C. Decker Inc., 1988.
46. **Crowley WF**. Precocious puberty: diagnosis and treatment. In: Garcia CR, Mastroianni L, eds. *Current therapy of infertility - 3*. Canada: B. C. Decker, Inc., 1988.
47. Spratt DI, Finkelstein JS, O'Dea LStL, Rao PN, **Crowley WF**. LHRH and induction of puberty. In: Shaw R, Marshall J, eds. *LHRH and its analogues -- their use in gynecological practice*. London: John Wright & Co. Publishers, 1988.
48. Finkelstein JS, O'Dea LStL, Spratt DI, **Crowley WF**. Pulsatile GnRH therapy in men with idiopathic hypogonadotropic hypogonadism. In: Christiansen C, Riis BJ, eds. *Highlights on endocrinology*. Norhaven Bogtrykkeri A/S, Denmark 1988,

49. Filicori M, Flamigni C, **Crowley WF**. The critical role of blood sampling frequency in the estimation of episodic luteinizing hormone secretion in normal women. (Chapter 1) In: The Episodic Secretion of Hormones, **Crowley WF** and Hofler JG (eds), New York; Churchill Livingstone, 1989, pp 5-14
50. Boepple PA, **Crowley WF**. Sexual precocity, GnRH analogs, and growth. In: Growth, Genetics & Hormones 1989; 5:1-7,
51. Whitcomb RW, **Crowley WF Jr**. Clinical review 4: Diagnosis and treatment of isolated gonadotropin-releasing hormone deficiency in men. J Clin Endocrinol Metab. 1990 Jan;70(1):3-7. *PMID:2403572*
52. **Crowley WF**, Whitcomb RW. Gonadotropin-releasing hormone deficiency in men: diagnosis and treatment with exogenous gonadotropin-releasing hormone. Am J Obstet Gynecol. 1990 Nov;163(5 Pt 2):1752-8. *PMID:2122732*
53. Blizzard RM, Link K, Romero G, Ball MW, Boepple PA, Crawford JD, Crigler JF, Mansfield MJ, **Crowley WF**. GnRH analogues and their use in the treatment of sexual precocity of central origin: a review. Endokrynologia Polska 1990; 41:315-325.
54. Whitcomb RW, **Crowley WF**. Diagnosis and treatment of isolated gonadotropin-releasing hormone deficiency in men. J Clin Endocrinol Metab 1990; 70:3-7.
55. Martin K, Santoro N, Hall J, Filicori M, Wierman M, **Crowley WF Jr**. Clinical review 15: Management of ovulatory disorders with pulsatile gonadotropin-releasing hormone. J Clin Endocrinol Metab. 1990 Nov;71(5):1081A-1081G. *PMID:2229271*
56. Boepple PA, **Crowley WF Jr**. Gonadotrophin-releasing hormone analogues as therapeutic probes in human growth and development: evidence from children with central precocious puberty. Acta Paediatr Scand Suppl. 1991;372:33-8. *PMID:1927518*
57. Boepple PA, Mansfield MJ, Crawford JD, Crigler JF, Blizzard RM and **Crowley WF**. Use of GnRH Analogues as Therapeutic Probes in Development: Differential Effects of Sex Steroids on Linear Growth vs. Skeletal Maturation in Children with Sexual Precocity. In: Reproduction, Growth and Development. Negro-Vilar A and Perez-Palacios G (eds), Raven Press, 1991; 71:91-98.
58. Conn PM, **Crowley WF Jr**. Gonadotropin-releasing hormone and its analogues. N Engl J Med. 1991 Jan 10;324(2):93-103. *PMID:1984190*
59. Taylor AE, Alonso-Whipple C, Khoury R, Couet ML, Ogunro EA, **Crowley WF**. Epitopic Mapping of Human Gonadotropins. In: Neuroendocrine Research Methods. Harwood Publishers, New York, 1991.
60. Hall JE, Taylor AE, Martin KA, **Crowley WF**. Neuroendocrine Investigation of PCOD: New Approaches. In: Polycystic Ovary Syndrome. A. Dunaif, MD, J. Givens, MD, G. Merriam, MD, and F. Haseltine, MD, PhD (eds), Blackwell Scientific Publications, Inc., Cambridge, MA 1992; pp. 39-50.
61. **Crowley WF Jr**, Jameson JL. Clinical counterpoint: gonadotropin-releasing hormone deficiency: perspectives from clinical investigation. Endocr Rev. 1992 Nov;13(4):635-40. *PMID:1459047*
62. Boepple PA, **Crowley WF**. Gonadotropin-releasing Hormone Agonist (GnRH) Therapy in Precocious Puberty. In: Pediatric Endocrinology. Springer-Verlag Press, Heidelberg. 1992; 2:1-2.
63. Whitcomb RW, **Crowley WF**. Critical Determinants of GnRH/ Gonadotrope Interactions in the Human. In: Modes of Action of GnRH and GnRH Analogs. W.F. Crowley and P Michael Conn (eds), Springer-Verlag, New York, 3-25, 1992.

64. Hall JE, **Crowley WF**. Use of GnRH Antagonists as Physiologic Probes in the Female. In: Modes of Action of GnRH and GnRH Analogs W.F. Crowley and P. Michael Conn (eds), Springer-Verlag, New York, pgs. 310-321, 1992.
65. Whitcomb RW, Finkelstein JS O'Dea LStL, Longcope and **Crowley WF**. Use of human models to understand sex steroid control of gonadotropin secretion in the human male. In: GnRH, GnRH Analogs, Gonadotropins and Gonadal Peptides. P. Bouchard, A.Caraty, H.J.T. Coelingh Bennink and S.N. Pavlou (eds), The Parthenon Publishing Group, pp. 437-458, 1993.
66. Whitcomb RW, **Crowley WF Jr**. Male hypogonadotropic hypogonadism. *Endocrinol Metab Clin North Am.* 1993 Mar;22(1):125-43. *PMID:8449184*
67. Hall JE, Taylor AE, Martin KA, **Crowley WF Jr**. New approaches to the study of the neuroendocrine abnormalities of women with the polycystic ovarian syndrome. *Ann N Y Acad Sci.* 1993 May 28;687:182-92. *PMID:8323172*
68. Taylor AE, Schneyer AL, Sluss PM, **Crowley WF**. Ovarian Failure, Resistance, and Activation. In: The Ovary. Eli Y. Adashi and Peter C.K. Leung (eds), Raven Press, Ltd, New York, pages 629-661, 1993.
69. **Crowley WF Jr**, Hall JE, Martin KA, Adams J, Taylor AE. An overview of the diagnostic considerations in polycystic ovarian syndrome. *Ann N Y Acad Sci.* 1993 May 28;687:235-41. *PMID:8323178*
70. Boepple PA, **Crowley WF**. Central Precocious Puberty: The Impact of Long-Term Pituitary-Gonadal Suppression induced by GnRH Agonists. In: Neuroendocrinology of Female Reproductive Function, U. Montemagno, C. Nappi, F. Petraglia and A.R. Genazzani (eds), Parthenon Publishing, pgs.147-164, 1993.
71. Whitcomb RW, **Crowley WF Jr**. Hypogonadotropic hypogonadism: gonadotropin-releasing hormone therapy. *Curr Ther Endocrinol Metab.* 1994;5:303-5. *PMID:7704740*
72. Conn PM, **Crowley WF Jr**. Gonadotropin-releasing hormone and its analogs. *Annu Rev Med.* 1994;45:391-405. *PMID:8198390*
73. Hall JE, Crowley **WF**. Gonadotropins and the Gonad: Physiology and their Disturbances in Clinical Endocrine Diseases. In: Endocrinology, Third Edition, Leslie J. DeGroot (ed), W.B. Saunders, Co., Philadelphia, 1995; pp 242-258.
74. **Crowley WF Jr**. Citation for the 1996 Rhône-Poulenc Rorer Clinical Investigator Award of The Endocrine Society to Andrea Dunaif. *Endocr Rev.* 1996 Aug;17(4):418-9. *PMID:8854057*
75. **Crowley WF Jr**, Thier SO. The continuing dilemma in clinical investigation and the future of American health care: a system-wide problem requiring collaborative solutions. *Acad Med.* 1996 Nov;71(11):1154-63. *PMID:9217505*
76. Whitcomb RW, **Crowley WF Jr**. Hypogonadotropic hypogonadism: gonadotropin-releasing hormone therapy. *Curr Ther Endocrinol Metab.* 1997;6:353-5. *PMID:9174769*
77. **Crowley WF Jr**. Citation for the 1997 Fred Conrad Koch Award of The Endocrine Society to Wylie Vale. *Endocr Rev.* 1997 Aug;18(4):612-3.
78. Pralong, FP, **Crowley WF**. Gonadotropins: Normal Physiology. In Wierman M, ed. Contemporary Endocrinology: Disease of the Pituitary: Diagnosis and Treatment. Humana Press Inc., Totowa, NJ. 1997 3: 203-219.

79. Hayes FJ, Hall JE, **Crowley WF**. Inhibin secretion in men and women during the menstrual cycle. In Filicori M, Flamigni D, eds.: Treatment of Infertility: The New Frontiers. New Jersey: Communications Media for Education, 1998, p 85-96.
80. Hayes FJ, **Crowley WF Jr**. Gonadotropin pulsations across development. Horm Res. 1998;49(3-4):163-8. *PMID:9550119*
81. Hayes FJ, Hall JE, Boepple PA, **Crowley WF Jr**. Clinical review 96: Differential control of gonadotropin secretion in the human: endocrine role of inhibin.
82. Kotlar T, Young RH, Albanese C, **Crowley WF Jr**, Scully RE, Jameson JL. Absence of mutations in the FSH receptor in ovarian granulosa cell tumors. J Clin Endocrinol Metab. 1998 Aug;83(8):3001. *PMID:9709983*
83. Welt CK, **Crowley WF Jr**. Activin: an endocrine or paracrine agent? Eur J Endocrinol. 1998 Nov;139(5):469-71. *PMID:9849807*
84. Hayes FJ, Seminara SB, **Crowley WF Jr**. Hypogonadotropic hypogonadism. Endocrinol Metab Clin North Am. 1998 Dec;27(4):739-63. *PMID:9922906*
85. Fauser BC, Devroey P, Yen SS, Gosden R, **Crowley WF Jr**, Baird DT, Bouchard P. Minimal ovarian stimulation for IVF: Appraisal of potential benefits and drawbacks. Human Reproduction 1999; 14:2681-6.
86. Hayes FJ, Welt CK, Martin KA, **Crowley WF**. Gonadotropin-releasing Hormone deficiency: differential diagnosis and treatment. The Endocrinologist. 1999; 9:36-44.
87. Seminara S, **Crowley WF Jr**. Hypogonadotropic hypogonadism: a unique biological opportunity. Clin Endocrinol (Oxf). 1999 Oct;51(4):385-6. *PMID:10583302*
88. Seminara SB, Oliveira LM, Beranova M, Hayes FJ, **Crowley WF Jr**. Genetics of hypogonadotropic hypogonadism. J Endocrinol Invest. 2000 Oct;23(9):560-5. *PMID:11079449*
89. Taylor AE, Hall JE, Adams JM, Martin KA, Welt CK, and **Crowley WF Jr**. The physiology of the human midcycle gonadotropin surge. In:Ovulation: Evolving Scientific and Clinical Concepts. Eli Y. Adashi, Editor. Springer-Verlag, New York, New York. Pp 79-97; 2000.
90. Seminara SB, **Crowley WF Jr**. Perspective: the importance of genetic defects in humans in elucidating the complexities of the hypothalamic-pituitary-gonadal axis. Endocrinology. 2001 Jun;142(6):2173-7. *PMID:11356659*
91. Seminara S, **Crowley WF Jr**. The genetics of IHH--a paradox. Clin Endocrinol (Oxf). 2001 Aug;55(2):159-60. *PMID:11531920*
92. **Crowley WF Jr**. Drug development and clinical research in the UK. Lancet. 2007 Jan 20;369(9557):174-5. *PMID:17240271*
93. **Crowley WF Jr**, Pitteloud N, Seminara S. New genes controlling human reproduction and how you find them. Trans Am Clin Climatol Assoc. 2008;119:29-37; discussion 37-8. *PMID:18596868/PMCID:PMC2394706*
94. Seminara SB, **Crowley WF Jr**. Kisspeptin and GPR54: discovery of a novel pathway in reproduction. J Neuroendocrinol. 2008 Jun;20(6):727-31. *PMID:18601695*

95. Andrews N, Burris JE, Cech TR, Collier BS, **Crowley WF Jr**, Gallin EK, Kelner KL, Kirch DG, Leshner AI, Morris CD, Nguyen FT, Oates J, Sung NS. Translational careers. *Science*. 2009 May 15;324(5929):855. *PMID:19443750/ PMCID: PMC2869292*
96. Pallais JC, Au M, Pitteloud N, Seminara S, **Crowley WF**. Isolated Gonadotropin-Releasing Hormone (GnRH) Deficiency Overview. In: Pagon RA, Bird TD, Dolan CR, Stephens K, editors. *GeneReviews* [Internet]. Seattle (WA): University of Washington, Seattle; 1993. 2007 May 23. *PMID:20301455*
97. Pallais JC, Au M, Pitteloud N, Seminara S, **Crowley WF**. Kallmann Syndrome. In: Pagon RA, Bird TD, Dolan CR, Stephens K, editors. *GeneReviews* [Internet]. Seattle (WA): University of Washington, Seattle; 1993-. 2007 May 23. *PMID:20301509*
98. **Crowley WF Jr.**, Pitteloud N, Seminara S. New genes controlling human reproduction and how you find them. *Trans Am Clin Climatol Assoc*. 2008; 119:29-37. Review. *PMID:18596868*
99. **Crowley WF Jr**, Gusella JF. Changing models of biomedical research. *Sci Transl Med*. 2009 Oct 7;1(1):1cm1. *PMID:20368150*
100. Ravikumar B, **Crowley WF Jr**. Kallmann Syndrome and hypogonadotropic Hypogonadism. Concluding remarks. *Front Horm Res*. 2010; 39:168-9. *PMID:20389094*
101. Sykiotis GP, Pitteloud N, Seminara SB, Kaiser UB, **Crowley WF Jr**. Deciphering genetic disease in the genomic era: the model of GnRH deficiency. *Sci Transl Med*. 2010 May 19;2 (32):32rv2. *PMID:20484732/ PMCID: PMC3936248*
102. Balasubramanian R, Dwyer A, Seminara SB, Pitteloud N, Kaiser UB, **Crowley WF Jr**. Human GnRH deficiency: a unique disease model to unravel the ontogeny of GnRH neurons. *Neuroendocrinology*. 2010;92(2):81-99. *PMID:20606386/ PMCID: PMC3214929*
103. **Crowley WF**. Commentary: The Year in Endocrine Genetics for Basic Scientists. Presented at the 2011 Endocrine Society (ENDO) Annual Meeting, Boston, MA *Mol Endocrinol*. 2011 Dec;25(12):1989-2002. Epub 2011 Nov 22. *PMID: 22108799/ PMCID: PMC3231829*
104. Pallais JC, Au M, Pitteloud N, **Crowley WF** et al. Kallmann Syndrome. 2007 May 23 [Updated 2011 Aug 18]. In: Pagon RA, Bird TD, Dolan CR, et al., editors. *GeneReviews™* [Internet]. Seattle (WA): University of Washington, Seattle; 1993-. *PMID: 20301509*
105. Pallais JC, Au M, Pitteloud N, **Crowley WF** et al. Isolated Gonadotropin-Releasing Hormone (GnRH) Deficiency Overview. 2007 May 23 [Updated 2010 Oct 14]. In: Pagon RA, Bird TD, Dolan CR, et al., editors. *GeneReviews™* [Internet]. Seattle (WA): University of Washington, Seattle; 1993-. *PMID: 20301455*
106. Martin C, Balasubramanian R, Dwyer AA, Au MG, Sidis Y, Kaiser UB, Seminara SB, Pitteloud N, Zhou QY, **Crowley WF Jr**. The Role of the Prokineticin 2 Pathway in Human Reproduction: Evidence from the Study of Human and Murine Gene Mutations. *Endocr Rev*. 2010 Oct 29. [Epub ahead of print] *PMID:21037178 / PMCID: PMC3365793*
107. Balasubramanian R, Plummer L, Sidis Y, Pitteloud N, Martin C, Zhou QY, **Crowley WF Jr**. The puzzles of the prokineticin 2 pathway in human reproduction. *Mol Cell Endocrinol*. 2011 Oct 22;346(1-2):44-50. Epub 2011 Jun 1 *PMID:21664414 / PMCID : PMC3216477*
108. **Crowley WF**. The developmental biology of the GnRH neurons. *Mol Cell Endocrinol*. 2011 Oct 22;346(1-2):1-3. Epub 2011 Jun 28. *PMID: 21741438*.

109. **Crowley WF.** Commentary: The Year in Endocrine Genetics for Basic Scientists. *Mol Endocrinol.* 2011 Dec;25(12):1989-2002. Epub 2011 Nov 22. *PMID: 22108799 / PMCID : PMC3231829*
110. Chew S, Balasubramanian, R, Chan W-M, Kang P, Andrews C, Webb B, MacKinnon S, Oystreck D, Rankin J, Crawford T, Geraghty M, Pomeroy S, **Crowley WF**, Jabs E, Hunter D, Grant P and Engle E. A novel syndrome caused by the E410K amino acid substitution in the neuronal B-tubulin isotype 3 *Journal of Neurology* 2012 Nov 9. pg1-14, *PMID: 23378218 / PMCID: PMC3572929*
111. Gallin EK, Bond E, Califf R, Crowley WF, Davis P, Galbraith R, Reece EA. Forging Stronger Partnerships between Academic Health Centers and Patient-Driven Organizations. *Acad Med* in press 2013. *PMID: 23887007*
112. Gustafson JA, Katzenellenbogen B, Jameson JL, Roth J, Melmed S, McDonnell D, Wartofsky L, **Crowley WF**, Griz LH, Becker C, Moore DD, Drucker D, Singh N, O'Malley B. Endocrine Society 2014 Laureate Awards. *Horm Cancer* 2014 Oct; 5(5):339-55. *PMID: 25091407*
113. **Crowley WF**, Balasubramanian R. MicroRNA-7a2 suppression causes hypogonadotropism and uncovers signaling pathways in gonadotropes. *J Clin Invest.* 2017 Mar 01; 127(3):796-797. *PMID: 28218621*
114. Xu C, Messina A, Somm E, Miraoui H, Kinnunen T, Acierno J, Jr., Niederlander NJ, Bouilly J, Dwyer AA, Sidis Y, Cassatella D, Sykiotis GP, Quinton R, De Geyter C, Dirlwanger M, Schwitzgebel V, Cole TA, Toogood AA, Kirk JMW, Plummer L, Albrech U, **Crowley WF**, Mohammadi M, Tena-Sempere M, Prevot V, Pitteloud N. KLB, encoding β -Klotho, is mutated in patients with congenital hypogonadotropic hypogonadism. *EMBO Mol Med.* 2017 Oct;9(10):1379-1397.*doi: 10.15252/emmm.201607376. PMID: 28754744*
115. Balasabramanian R, **Crowley WF Jr.** Congenital Hypogonadotropic Hypogonadism in Males: Clinical Features and Pathophysiology. *Male Hypogonadism- basic, clinical and therapeutic principles In Press*

Books/Textbooks for the medical or scientific community

1. **Crowley WF**, Hofler JG, eds. The Episodic Secretion of Hormones. New York: Churchill Livingstone, Publishers, 1987.
2. **Crowley WF.** Spanning the Theory-Practice Divide and Information Science. The Scarecrow Press, Inc., 2004.

Major Scientific Accomplishments

1. **Development of GnRH Analogues as Therapeutic Agents in a Wide Variety of Human Diseases** My group first determined that continuous occupancy of GnRH's cognate receptor by GnRH agonists could paradoxically induce a homologous desensitization of the GnRH receptor in humans. This pharmacologic effect resulted in complete suppression of gonadotropin and gonadal secretion, i.e. a reversible 'biochemical castration' (5, 8). We next demonstrated this pharmacologic approach was an effective treatment for children suffering from central precocious puberty (8, 10, 13, 15, 24, 27, 32) and uterine fibroids (14). Based upon our research, this approach not only remains the treatment of choice for children in the precocious puberty but has also now completely replaced anatomic castration in men with metastatic prostate cancer and is also used in women with endometriosis and IVF (15). Collectively these applications account for annual drug sales of \$3.5B/year.

2. **Development of Pulsatile GnRH Administration to Treat Human GnRH Deficiency**

We defined that restoration of completely normal, physiologic patterns of pituitary gonadotropin secretion and sex steroid secretion could be obtained in a wide variety of human GnRH deficient states but only by using natural sequence GnRH if it was administered: a) in an intermittent or pulsatile fashion (6, 12, 15, 22); b) in physiologic doses (34); and c) at physiologic frequencies to reverse several hypogonadal states afflicting men and women (12, 20, 22, 25). To accomplish these goals, we; a) developed a portable infusion pump (in collaboration with Dean Kamen) to administer GnRH intermittently (12, 22, 25); b) studied large numbers of healthy men and women with frequent blood sampling to define the frequency of their endogenous GnRH secretion; c) set the frequencies of these pumps to mimic these physiological frequencies of GnRH administration (16, 22, 30, 46); and then d) administered varying doses at these physiologic frequencies and completely restored normal levels and patterns of gonadotropin and gonadal sex steroid secretion (6, 12, 20, 22, 23, 25). These treatments are now used to restore full sexual maturation and fertility in men with absent puberty and ovulation in women with an ovulatory fertility. These latter studies also led to FDA approval and availability of this therapy for humans and engendered novel approaches to neuroendocrine investigation in the human (cf. below).

3. **Defining the Role of the Hypothalamus in Controlling Reproduction in Humans**

We soon appreciated by contrasting the pituitary and gonadal responses of our GnRH deficient patients (whose hypothalamic input was controlled) with those of normal men and women (whose hypothalamic-pituitary-gonadal responses were unconstrained), we could define the relative role of the hypothalamus vs the pituitary in the human in several physiological circumstances such as sex steroid feedback in humans for the first time (23, 26, 29, 31, 34, 47-49, 55). Using this 'tandem model' of human research, we defined the relative roles and sites of actions of androgens (133), estrogens (134), and Inhibin B (147) in humans in ways that had not previously been possible.

4. **Discovery of Genes Controlling Puberty in the Human**

Science Magazine's 125th year edition listed the quest for the genetic basis of human puberty as one of biomedical research's "**125 Great Unanswered Questions**". Using clinical research and genetic approaches, we discovered several of the long-sought genes responsible for triggering human puberty (157,159,172, 180-182). Our 2003 *N. Engl. J. Med.* paper (with Dr. Stephanie Seminara as the lead author) described that mutations in a novel GPCR receptor (*GPR54*) caused a syndrome of absent puberty in a Middle Eastern family. This article was a double length contribution and the first time that human and animal models were conjointly published in the *NEJM*. Discovery of this novel *GPR54* system (now termed the Kisspeptin signalling system) controlling GnRH secretion has launched an entire field of study of this ligand/receptor pair which appears to control GnRH secretion in all primate species studied to date.

We have also described the genotype/phenotype spectrum of mutations within the *FGFR1* signalling pathway in humans causing GnRH deficiency. Mutations in this receptor, in combination with mutations in other genes, i.e. oligogenicity, account for the skewed segregation of phenotypes associated with GnRH deficiency frequently seen within families sharing the same mutation in *FGFR1* as well as between humans with the same mutations in different families (170, 172,175). These observations of oligogenicity account for much of the phenotypic variability that occurs in patients with GnRH deficiency. They imply that oligogenic defects must occur more broadly in other genetic disorders in which a similar pattern of incomplete penetrance is apparent. Most recently (180), we also discovered another novel ligand/receptor pair, Prokineticin 2 (*PROK2*) and its receptor (*PROKR2*) that also causes isolated GnRH deficiency in the human. This ligand/receptor system appears to be a

candidate for a second messenger from the suprachiasmatic 'clock' in the hypothalamus to the reproductive system.

Piecing together the various mutations in the *GPR54/KISS1* system with the *FGFR1/FGF8* system and now the *PROKR2/PROKR2* system, we have established the importance of the human experimental model of Isolated GnRH deficiency in unraveling the complex genetics and ontogeny of the GnRH neuronal system in the human. Defects in a wide array of individual ligand/receptor genes are weaving a remarkable tapestry of the developmental biology of this system that is uniquely being driven by these highly focused translational research studies in patients. These efforts have broad bedside to bench applications in reproduction and lay the groundwork for discovery of the genes underlying common reproductive disorders such as hypothalamic amenorrhea, precocious and delayed puberty, and polycystic ovarian disease (170, 189).

5. Training and Mentorship of Translational Investigators

Our unit has trained over 85 clinical investigators for careers at the translational interface between bench and bedside. Of these trainees, >80% remain in academic posts funded by competitive, peer-reviewed funding; >60% are women; and many have assumed key leadership roles in the Endocrine Society including 2 of whom have successfully run for President of the Endocrine Society and 3 of whom have served on its Council. Eleven of my first 13 trainees are full Professors and remain active leaders in the field. Women in Endocrinology awarded me Mentor or the Year in 2001, the first time a male received this award. In 2007, the National Institute of Child Health and Development awarded my Training Grant renewal a Mentoring Award and a 10 year renewal on the basis of our leadership in this area.

Administrative Accomplishments

1. Founder and Chairman of The Clinical Research Forum

Twenty years ago, I founded and served as Chairman of The Clinical Research Forum for 16 years. This group is a consortium of 50-60 leading academic health centers focusing on clinical research that collectively account for >78% of the NIH's extramural research funding. It meets annually to share best practices in clinical research, respond collectively to important national policies relating to clinical research, lobby for increased biomedical research and NIH funding, and leverage each others experiences to improve the translational capacity of our academic medical centers to bring basic research findings into alleviation of human suffering more swiftly. This ability to unite previously competitive centers into an effective and cohesive group able to speak nationally with a single voice on clinical research has been considered by many observers to be a unique contribution to academic research.

I was a key author on 2 critically important papers from the Institute of Medicine's 4 year long Clinical Research Roundtable in JAMA that redefined the current landscape of problems in clinical research in this country and selected important strategic solutions to them (141, 154, 161).

Director of Clinical Research at the Mass General Hospital

I served as the Director of Clinical Research and the Clinical Research Program (CRP) the Mass General Hospital for 18 years where I built a large and innovative clinical research infrastructure program designed to support the work of other investigators within our institution. Last year, the CRP hosted >3,700 investigators who attended our lecture series. The CRP also established a cadre of well-trained study coordinators that are now available to our clinical investigators. The impact of this program has

been remarkable in that the MGH's clinical trial efforts have growth 400% during this period and our clinical research budgets now account for almost 1/3 of the MGH's research portfolio.

Past President of the Endocrine Society

As President of the Endocrine Society in 2001-2, I presided over the largest Annual Meeting in our history whose theme I selected: *The Impact of the Human Genome Project on Endocrinology* and instituted numerous innovations that remain until today including active interfaces with our affiliated societies termed the Sister Society Symposium, a series of new disease management programs, and a continued emphasis on young clinical investigators.