

## **Erica Elizabeth Marsh M.D.**

Department of Obstetrics and Gynecology  
Division of Reproductive Endocrinology and Infertility  
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### **Education**

#### **Harvard College**

**Cambridge, MA**

September, 1987-June, 1991. Bachelor of Arts; *magna cum laude* in Sociology.

#### **Harvard Medical School**

**Boston, MA**

September 1996-2001. MD with honors in a Special Field – *cum laude*, June, 2001.

#### **Northwestern University**

**Chicago, IL**

September 2005 – June 2008 Masters of Science in Clinical Investigation (MSCI)

### **Medical Training**

**Harvard/Brigham and Women's Hospital/ Massachusetts General Hospital Integrated Residency Program in Obstetrics and Gynecology.** July 2001 – June 2005 **Boston, MA**

#### **Feinberg School of Medicine - Northwestern University**

**Chicago, IL**

**Reproductive Endocrinology and Infertility Fellowship,** July 2005 – June 2008.

### **Faculty Appointment(s):**

#### **Assistant Professor**

**Chicago, IL**

Divisions of Reproductive Endocrinology and Infertility (clinical) and Reproductive Biology Research (research) -- Department of Obstetrics and Gynecology -- Feinberg School of Medicine, Northwestern University. September 2008 - present

### **Awards/Honors:**

- ◇ 2008 Berlex Foundation Workshop on Clinical Research
- ◇ 2007 Wyeth- Society of Gynecological Investigation Presidential Presenter's Award
- ◇ 2006-2007 ACOG/Ortho Women's Health Academic Training Fellowship in Obstetrics and Gynecology
- ◇ 2005 AMA Excellence in Medicine Leadership Award
- ◇ 2004 Garrett/Pitcher Award for International Research – World Health Organization, Geneva, Switzerland.
- ◇ 2003 Harvard Medical School Resident Teaching Award
- ◇ 2002 NIH/NMA Academic Medicine Fellowship
- ◇ 2002 Endocrine Society Travel Award
- ◇ 2001 Wyeth-Ayerst Laboratory Prize in Women's Health
- ◇ 2001 Paul Dudley White International Fellowship. Nairobi, Kenya. February, 2001.
- ◇ 2000-2001 Selected Professions Medical Fellowship Award Recipient, American Association of University Women.
- ◇ 2000 Franklin C. McLean Scholar for Outstanding Academic Achievement, National Medical Fellowships and American Association of Medical Colleges
- ◇ 2000-2001 Selected for AAAS short course on "Recruitment of Minorities as Research Subjects"

- ◇ 1999 Inducted into the Aesculapean Club of Harvard Medical School,
- ◇ 1997-1998 Career Development Award Recipient, American Association of University Women.
- ◇ 1996 National Medical Fellowships (NMF) Scholarship Recipient.

**Research Fellowships/Grants:**

**2008 Harold Amos Medical Faculty Development Program -- Robert Wood Johnson Foundation.** Grant allowing for four years for junior faculty development with 70% protected research time for research. July 2008 – June 2012.

**2007 Northwestern Memorial Foundation Young Investigators Grant.** Grant to fund one year pilot study on the function of specific miRNA in leiomyoma and the effects of steroid hormones on this phenomena. January 2007-December 2007.

**2006-2007 Northwestern Memorial Hospital Women's Board Grant.** Grant to fund one year pilot study on the role of miRNA in leiomyomas. September 2006-August 2007.

**2006-2007 ACOG/Ortho Women's Health Academic Training Fellowship in Obstetrics and Gynecology.** Stipend for research time during fellowship.

**National Institutes of Health Grant U54HD29164-09S1.** U54 Supplementary grant (PI: William Crowley, MD) to fund two years of research on menstrual cycle dynamics in African American women. Research performed at the National Center for Infertility Research in the Reproductive Endocrine Unit at the Massachusetts General Hospital. December 1999 – December 2001.

**Harvard Medical School Office of Enrichment Student Research Grant-** research support during academic year . September 1999 – June 2000.

**Endocrine Society Student Research Fellowship.** nationally competitive fellowship that provides research funding to promising students to encourage them to pursue careers in endocrinology. Summer 1999

**Bristol-Myers Squibb Company/National Medical Fellowships Inc. Academic Medicine Fellow-** nationally competitive fellowship that provides research funding to encourage minority students to consider careers in research and academic medicine; Summer 1998 (concurrent).

**Merck Company Foundation/AAMP Minority Medical Student Summer Research Fellow--** nationally competitive fellowship that provides research funding to encourage minority students to consider careers in academic medicine; Summer 1998 (concurrent).

**Harvard Medical School Office of Enrichment Student Research Grant-** funding provided for continuation of summer research during academic term. September 1996 - 1998.

**Mallinkrodt General Clinical Research Center of Massachusetts General Hospital Medical Student Fellowship** – competitive research fellowship for medical students to encourage exposure to clinical research. Summer, 1997.

**Massachusetts General Hospital Summer Research Training Program** – nationally competitive eight week research program designed to introduce students to basic science and clinical research. Summers of 1996 and 1997.

**Massachusetts General Hospital Biomedical Careers Research Fellowship** - Nationally competitive research fellowship that provides clinical and basic science exposure to young people transitioning into medicine from other careers/fields. October, 1995-August, 1996.

### **Peer Reviewed Publications**

Hayes FJ, McNicholl DJ, Schoenfeld D, **Marsh EE**, Hall JE. Circulating free alpha-subunit is superior to luteinizing hormone as a marker of gonadotropin-releasing hormone despite desensitization at fast pulse frequencies. *J Clin Endocrinol Metab.* 1999 Mar;84(3):1028-36.

Hall JE, Lavoie HB, **Marsh EE**, Martin KA.. **Decrease in GnRH pulse frequency with aging in postmenopausal women.** *J Clin Endocrinol Metab* May 2000;85:1794-1800.

**Marsh EE** and Laufer MR. **Premenarcheal antecedent of endometriosis without an associated obstructive anomaly: Presentation, diagnosis, treatment and Long Term Follow Up** *Fertil Steril.* 2005 Mar;83(3):758-60.

Lavoie, HB, **Marsh EE**, Hall JE. Absence of Apparent Circadian Rhythm of Gonadotropins and Free Alpha Subunit in Postmenopausal Women: Evidence for Distinct Regulation Relative to Other Hormonal Rhythms. *Journal of Biological Rhythms.* Feb 2006, 21(1): 58-67.

**Marsh EE** and Bulun SE. Steroid Hormones and Leiomyomas. *Obstetrics and Gynecology Clinics of North America.* March 2006; 33: 59-67.

Bulun SE, Chen D, Lu M, Zhao H, Cheng Y, Demura M, Yilmaz B, Martin R, Utsunomiya H, Thung S, Su E, **Marsh E**, Hakim A, Yin P, Ishikawa H, Amin S, Imir G, Gurates B, Attar E, Reierstad S, Innes J, Lin Z. Aromatase excess in cancers of breast, endometrium and ovary. *J Steroid Biochem Mol Biol.* 2007 Aug-Sep;106(1-5):81-96. Epub 2007 May 24

Xue Q, Lin Z, Cheng YH, Huang CC, **Marsh E**, Yin P, Milad MP, Confino E, Reierstad S, Innes J, Bulun SE. Promoter Methylation Regulates Estrogen Receptor 2 in Endometrium and Endometriosis. *Biol Reprod.* 2007 Oct;77(4):681-7. Epub 2007 Jul 11.

**Marsh EE**, Z Lin, P Yin, M Demura, M Milad, D Chakravarti, S Bulun. Differential Expression of MicroRNA in Leiomyoma versus Normal Myometrium. *Fertility and Sterility.* 2008 Jun; 89(6):1771-6. Epub 2007 Aug 30.

Yin P, Lin Z, Cheng YH, **Marsh EE**, Utsunomiya H, Ishikawa H, Xue Q, Reierstad S, Innes J, Thung S, Kim JJ, Xu E, Bulun SE. Progesterone Receptor Regulates bcl-2 Gene Expression Through Direct Binding To Its Promoter Region In Uterine Leiomyoma Cells. *J Clin Endocrinol Metab.* 2007 Nov;92(11):4459-66. Epub 2007 Sep 4.

Ishikawa H, Fencki V, **Marsh EE**, Yin P, Chen D, Cheng YH, Reisterd S, Lin Z, Bulun SE. CCAAT/Enhancer Binding Protein beta (C/EBP{beta}) Regulates Aromatase Expression via Multiple

and Novel DNA Sequences in Uterine Leiomyoma. *J Clin Endocrinol Metab.* 2008 Mar; 93(3) 981-91. Epub 2008 Jan 8.

### **Book Chapters**

Marsh EE and RB Barnes. "Obesity and Conception" in *Obesity and Pregnancy*, eds. M Rees, M Karoshi, and L Keith. London: The Royal Society of Medicine Press, 2008. pp 78-88.

### **Scientific Abstracts**

Lavoie. HB, **EE Marsh**, KA Martin, and JE Hall. Circadian Rhythm of Gonadotropin and Free  $\alpha$ -Subunit in Postmenopausal Women: Effect of Aging Reproductive Endocrine Unit, Massachusetts General Hospital, Boston, MA 02114. The Endocrine Society, abstract, 1997.

**Marsh EE**, AE Taylor, EJ Anderson and JE Hall. Absence of Circadian Rhythm of Leptin in Normally Cycling Young Women Reproductive Endocrine Unit, Massachusetts General Hospital, Boston, MA 02114. The Endocrine Society, Abstract,2000. Selected for Oral Presentation.

**Marsh EE** and JE Hall. Circadian Rhythm of the Gonadotropins in Young Normally Cycling Women Reproductive Endocrine Unit, Massachusetts General Hospital, Boston, MA 02114. The Endocrine Society, Abstract, 2000.

**Marsh EE**, T Tiamfook, K Rado, and JE Hall. Differences in Reproductive Hormonal Dynamics Between African-American and Caucasian Women. Reproductive Endocrine Unit, Massachusetts General Hospital, Boston, MA 02114. The Endocrine Society, Abstract, 2002. Selected for Oral Presentation.

**Marsh EE**, T Tiamfook, K Rado, and JE Hall. Higher Estrogen Levels in African-American Women Compared with Caucasian Women. Reproductive Endocrine Unit, Massachusetts General Hospital, Boston, MA 02114. The National Medical Association, Abstract, 2002. Selected for Oral Presentation.

**Marsh EE**, P Yin, S Reierstad and SE Bulun: In vivo and in vitro expression of leptin and leptin receptor in human myometrium and leiomyoma. The Endocrine Society, 88<sup>th</sup> Annual Meeting, Boston, Massachusetts, 2006 (Poster Presentation).

Yin P, Z Lin, S Reierstad, **EE Marsh**, H Utsunomiya, S Thung and SE Bulun: The effects of progesterone on cell survival and Bcl-2 mRNA levels in leiomyoma smooth muscle cells. Society of Gynecological Investigation, 53<sup>rd</sup> Annual Meeting, Toronto, Canada, 2006 (Poster Presentation).

**Marsh EE**, Z Lin, P Yin and SE Bulun: Role of microRNAs in human uterine leiomyoma pathogenesis and growth. American Society for Reproductive Medicine, 62<sup>nd</sup> Annual Meeting, New Orleans, Louisiana, 2006 (Poster Presentation).

**Marsh EE**, Z Lin, P Yin, E Confino and SE Bulun: Increased aromatase mRNA expression and cell proliferation in human leiomyoma cells with leptin treatment. VIII International Aromatase Conference, Baltimore, Maryland, 2006 (Poster Presentation).

**Marsh EE**, Z lin, M Demura, P Yin, E Xu, J.J Kim and SE Bulun: Leptin increases aromatase expression in human leiomyoma cells primarily via the Jak-Stat pathway and aromatase promoter I.4 region. Society of Gynecological Investigation, 54<sup>th</sup> Annual Meeting, Reno, Nevada, 2007 (**Oral Presentation – Presidential Presenters Award**).

Hoekstra A, EC Ward , Z Lu, JL Hardt, **EE Marsh**, P Yin, SE Bulun and JJ Kim: The forkhead family of transcription factors are differentially expressed and regulated in leiomyoma and myometrial cells. Society of Gynecological Investigation, 54<sup>th</sup> Annual Meeting, Reno, Nevada, 2007 (**Oral Presentation**).

Ishikawa H, V Fenkei, **EE Marsh**, P Yin, D Chakravarti and SE Bulun: Aromatase expression in uterine fibroid cells is regulated by promoter elements that bind CAATT/enhancer binding proteins (C/EBPs). Society for Gynecologic Investigation, 54<sup>th</sup> annual meeting, Reno, Nevada, 2007 (Poster Presentation).

Yin P, Z Lin, YH Cheng, **EE Marsh**, H Utsunomiya, H Ishikawa, S Reierstad, JJ Kim, E Xu, and SE Bulun: A sequence in the 5' flanking region on the human Bcl-2 gene confers progesterin responsiveness in uterine leiomyoma cells in vitro. Society for Gynecologic Investigation, 54<sup>th</sup> annual meeting, Reno, Nevada, 2007 (Poster Presentation).

Xue Q, Z Lin, P Yin, **EE Marsh**, S Reierstad and SE Bulun: Differential expression of ER $\beta$  in endometrial and endometriotic stromal cells: regulation by methylation. Society for Gynecologic Investigation, 54<sup>th</sup> annual meeting, Reno, Nevada, 2007 (**Oral Presentation**).

Ishikawa H, V Fencki, **EE Marsh**, P Yin, D Chakravarti and SE Bulun: CAATT/enhancer binding proteins binding element and cAMP response element play crucial role for aromatase expression in uterine fibroid. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

Trukhacheva E, Z Lin, S Reierstad, J Innes, **EE Marsh**, Q Xue, Y Cheng and SE Bulun: Estradiol regulates ESR1 (ER- $\alpha$ ) gene expression via alternative promoters in endometrium and endometriosis. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

Yin P, Z Lin, **EE Marsh**, YH Cheng, H Ishikawa, Q Xue, S Reierstad, J Innes, JJ Kim, E Xu and SE Bulun: Identification of novel progesterone receptor target genes in uterine leiomyoma. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

Xue Q, Z Lin, P Yin, M Milad , H Utsunomiya, E Confino, S Reierstad, **EE Marsh**, and SE Bulun: Methylation of SF-1 (steroidogenic factor-1) promoter regulates its expression in endometrial vs. endometriotic stromal cells. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

Wang Y, **EE Marsh**, SE Bulun and E Xu: Stem cell markers in mouse and human uterine myometrium and leiomyoma. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

**Marsh EE**, Z Lin, P Yin, E Xu, D Chakravarti and SE Bulun: MicroRNA species are differentially expressed in human uterine leiomyoma versus adjacent normal myometrium. The Endocrine Society, 89<sup>th</sup> Annual Meeting, 2007 (Poster Presentation).

**EE Marsh**, Z Lin, P Yin, E Confino, M Milad, and SE Bulun. Leptin Increases VEGF and VEGF-Receptor Expression in Human Uterine Leiomyoma Cells In Vitro. American Society for Reproductive Medicine, 63<sup>nd</sup> Annual Meeting, Washington, DC, October 2007 (Oral Presentation).

**EE Marsh**, EK Pearson, P Yin, H Ishikawa, JJ Kim, SE Bulun: Expression of Steroidogenic Acute Regulatory (StAR) Protein, CYP11A1 and CYP17A1 mRNA in Human Normal Myometrium and Leiomyoma Tissue. The Endocrine Society, 90<sup>th</sup> Annual Meeting, 2008 (Poster Presentation-Travel Award Recipient).

### **Professional Memberships/Appointed Positions**

◇ Accreditation Council on Graduate Medical Education (ACGME) OB/GYN Residency Review Committee (RRC) -- Resident/Young Physician representative. May 2004 - April 2006.

- ◇ Accreditation Council on Graduate Medical Education (ACGME) Resident's Council – Member.  
May 2004- April 2006.
- ◇ American College of Obstetricians and Gynecologists – former District I Junior Fellow Chair;  
Founding member of HMS Student Chapter of ACOG and former Chair; participant in the 2003 and  
2004 ACOG Legislative Workshop in Washington D.C.
- ◇ American Society for Reproductive Medicine
- ◇ Endocrine Society
- ◇ National Medical Association
- ◇ Women in Endocrinology
- ◇ American Medical Association

**Certification and Licensure**

- ◇ Diplomate, American Board of Obstetrics and Gynecology as of 01/2009
- ◇ State of Illinois Full Medical and Controlled Substance Licenses
- ◇ Federal DEA License