

BIOGRAPHICAL SKETCH

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NAME Al-Hendy, Ayman, MD, PhD <hr/> eRA COMMONS USER NAME AYALHEND	POSITION TITLE Professor, Vice Chair		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Zagazig University, Benha, Egypt	MD	1980–1986	Medicine
Turku University, Turku, Finland	PhD	1988–1992	Molecular Biology
McMaster University, Hamilton, Canada	Postdoc	1992–1994	Gene Therapy
McGill University, Montreal, Canada	Fellow	1994–1995	Molecular Genetics
Saskatchewan University, Saskatoon, Canada	Resident	1995–2000	Ob/Gyn
American Board of Obstetrics and Gynecology	Diplomate	2002, 2008	Ob/Gyn

A. Positions and Honors.

Positions and Employment

2000–2005	Assistant Professor, Division of Gynecology, Department of Obstetrics & Gynecology, University of Texas Medical Branch (UTMB), Galveston, Texas
2006–2007	Associate Professor, Division of Gynecology, Dept OB & GYN, UTMB, Galveston, Texas
2007–Present	Professor & Vice Chair, Dept OB & GYN, Meharry Medical College, Nashville, Tennessee
2007–Present	Scientific Director, Center for Women Health Research, Associate Director, Clinical Research Center, Meharry Medical College, Nashville, Tennessee
2007–Present	Gynecologist/Obstetrician, Nashville (Metro) General Hospital, Nashville, Tennessee
2008–Present	Adjunct Professor, Department of Radiology and Radiological Sciences, Vanderbilt University Medical Center, Vanderbilt University, Nashville, Tennessee

Other Experience and Professional Memberships

June 2005	NIH Pregnancy & Neonatology Study section (PN), <i>Ad Hoc</i> member
2007–Present	Chair, Research subcommittee, NCRR -RCMI Translational Research Network (RTRN)
Nov 2007	NIH/NICHD U54 special emphasis group, Specialized Cooperative Centers for Reproduction and Infertility Research (SCCPRIR)
2008–Present	Chair-elect, Fibroid Special interest group, American society of Reproductive Medicine
Feb 2008	NIH Integrative & Clinical Endocrinology and Reproduction SS (ICER), <i>Ad Hoc</i> member
June 2009	NIH Special Emphasis Panel/Scientific Review Group 2009/10 ZRG1 EMNR-C (58) R meeting, <i>Ad Hoc</i> member
1995–present	Member, SOGC (Society of Obstetricians & Gynecologists of Canada)
1995–present	Member, ACOG (American College of Obstetricians & Gynecologists)
2000–present	Member SGI (Society of Gynecologic Investigations)
2000–present	Member, The American Society of Gene Therapy
2000–present	Fellow, The Royal College of Physicians and Surgeons of Canada (FRCSC)

Honors

1990	Young Investigator Award. 1st Congress of International Endotoxin Society, San Diego, Calif
1994	Postdoctoral Clinical Award of the American Society of Human Genetics, 18–22 October, Montreal, Quebec, Canada
1998	First Prize Paper, 46 th American College of Obstetrics and Gynecology Annual Clinical Meeting, May 9–13, New Orleans, La
1998	<i>Peter Vernon</i> Clinical Fellowship award in Gynecologic Oncology, Division of Gynecologic Oncology, Dept of Obstetrics & Gynecology, University of Toronto
1998	SOGC Junior Member Elective Fellowship Award, Ottawa, Ontario, Canada
1998	Medical Research Council of Canada and Canadian Society of Clinical Investigations Annual Resident Research Award, Ottawa, Ontario, Canada
1999	Jr. Fellow Prize Paper Presentation, ACOG District VI meeting, Oct 26–29, 1999, Maui, Hawaii

2003 America's Top Obstetricians and Gynecologists, Consumers' Research council of America.
2003 Golden Apple Teaching Award, Best Teacher, Department of Obstetrics & Gynecology,
UTMB, Galveston, Texas, June 2003.

B. Selected peer-reviewed publications (selected from a Total of 60 published/In Press articles).

Al-Hendy A. Auersperg N. Applying adenovirus-mediated thymidine kinase/Ganciclovir system to ovarian cancer. An efficient in vitro drug sensitization approach. *Gynecol Obstet Invest.* 1997;43:268–275.

Al-Hendy A. Magliocco A, Al-Trewegeri T, et al. Ovarian cancer gene therapy: repeated treatment with thymidine kinase in an adenovirus vector and ganciclovir improves survival in a novel immunocompetent murine model. *Am J Obstet Gynecol.* 2000;182:553–559.

Al-Hendy A. Moshynska O, Saxena A, Feyles V. Association between mutations of the follicle-stimulating-hormone receptor and repeated twinning. *Lancet*, 2000 Sept.9; 356(9233): 914.

Al-Hendy A. Moshynska O, Saxena A, Feyles V. Follicle-stimulating-hormone receptor and twinning. *Lancet*, 2001 January 20; 357(9251):231.

Young S, **Al-Hendy A.** Copland J. Potential Non-hormonal Therapeutics for medical treatment of leiomyomas. In Uterine leiomyoma: Options and Choices; Editor Bruce R. Carr, *Seminars in Reproductive Medicine*, 2004, 22(2):121-130.

Al-Hendy A. Lee E.J, Wang HQ, Eyzaguirre E, Copland JA. Gene therapy of uterine fibroids: adenovirus-mediated express of dominant negative estrogen receptor inhibits tumor growth in nude mice. *Am J Obstet Gynecol*, 2004. November 191 (5):1621-1631.

Walker CL and Stewart EA. Uterine Fibroids: The elephant in the room. *Science* 2005 June,5728(308): 1589-1592. (**Al-Hendy A.** Contributed histological photos to this review).

Al-Hendy A. and Salama A. Salama. Catechol-O-methyltransferase polymorphism is associated with increased uterine leiomyoma risk in different ethnic groups. *J Soc Gynecol Invest* 2006. Feb;13(2): 136-144.

Al-Hendy A. and Salama S. Gene therapy and uterine leiomyoma: a review. *Human Reproduction updates*, 2006 July-Aug;12(4) 385-400.

Salama S., Shu-Leong Ho, Hui Q. Wang, Jukka Tenhunen, Carola Tilgmann, and **Al-Hendy A.** Hormonal regulation of catechol-O-methyl transferase activity in women with uterine leiomyomas *Fertility & Sterility*, 2006, July;86(1): 259-262.

Al-Hendy A. Salama S. Ethnic distribution of estrogen receptor-alpha polymorphism is associated with a higher prevalence of uterine leiomyomas in black Americans. *Fertility & Sterility*, 2006, 86: 686-693.

Al-Hendy A. Wang H, Copland J. Estrogen and progesterone receptors expression in the endocervix. Implications for hormone replacement therapy after subtotal hysterectomy. *Middle East Fertility Society J* 2006, 11 (3): 216-221.

Salama S, Abdelhakim B., Raghvendra K. Dubey, and **Al-Hendy A.** Estrogen metabolite 2-methoxyestradiol induces apoptosis and inhibits cell proliferation and collagen production in rat and human leiomyoma cells: A potential medicinal treatment for uterine fibroids. *J Soc of Gynecol Investig* 2006 Dec, 13 (8): 542-50.

Wentz M, Jamaluddin M, Garfield R and **Al-Hendy A.** Regulation of catechol-O-methyltransferase expression in human myometrial cells. *Obstetrics & Gynecology* 2006 Dec;108(6):1439-47

William W. Au, Salama S, Carlos H. Sierra-Torres, Ayman **Al-Hendy** Environmental risk factors for prevention and molecular intervention of cervical cancer. *Int J Hyg Environ Health.* 2007 Dec; 210 (6): 671-8.

Salama S, Kamel M, Christman G, Wang H and **Al-Hendy A.** Gene Therapy of Uterine Fibroids: Adenovirus-Mediated Herpes Simplex Virus Thymidine Kinase/Ganciclovir Treatment Inhibits Growth of Human and Rat Leiomyoma Cells in vitro and in nude mice. *Obstetrics Gynecologic Investigations* 2007, 63 (2): 61-70.

William W. Au, Salama Abdou-Salama, **Al-Hendy, A.** Inhibition of growth of cervical cancer cells using a dominant negative estrogen receptor gene. *Gynecologic Oncology* 2007 Feb; 104(2): 276-80.

Fang L, Longo M, Tamayo E, Maner W, **Al-Hendy A.** Anderson G, Hankins G, Saade G. The Effect of Over-expression of sFlt-1 on Blood Pressure, and the Occurrence of Other Manifestations of Preeclampsia, in Unrestrained Conscious Pregnant Mice. *Am J Obstet Gynecol* 2007 Apr;196(4):396.e1-7.

Othman E, salama S, Ismail N, and **Al-Hendy A.** Toward gene therapy of endometriosis: adenovirus-mediated delivery of dominant negative estrogen receptor genes inhibits cell proliferation, reduces cytokine production, and induces apoptosis of endometriotic cells. *Fertility & Sterility* 2007 Aug; 88(2): 462-71.

Kamel M, Salama S, Saleh S, Osman A, Mohamed M. Sayed-Ahmed, and **Al-Hendy A.** Reversal of doxorubicin resistance by adenovirus-mediated transfer of cyclooxygenase-2 antisense in multidrug-resistant MCF-7 cells. *Cancer Therapy.* 2007(5)1-10

Salih S, Xu X, Veenstra TD, Duleba AJ, Fouad H, Nagamani M, **Al-Hendy A**. Lower levels of urinary 2-hydroxyestrogens in polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2007 Aug;92(8):3285-91.

Saed G, **Al-Hendy A**, Salama S, and Diamond M. Gene therapy of peritoneal adhesions: Adenovirus expressing COXII-antisense induce apoptosis in adhesion but not in normal peritoneal fibroblasts. *Fertility & Sterility* 2008 May;89 (5 Suppl): 1455-60.

Salama S., Mohammad Jamaluddin, Raj Kumar, Memy H. Hassan and Ayman **Al-Hendy**. Progesterone regulates catechol-O-methyl transferase gene expression in breast cancer cells: Distinct effect of progesterone receptor isoforms. *J Steroid Biochemistry Mol Biol* 2007 Nov-Dec, 107 (3-5): 253-61

Salih S, Jamaluddin M, Salama S, Fadel A, Nagamani M and **Al-Hendy A**. Regulation of Catechol-O-Methyl Transferase Expression in Granulosa Cells: A Unifying Model for Follicular Atresia in Polycystic Ovary Syndrome. *Fertility & Sterility* 2007 July 3; 89(5) 1414-1421

Hassan MH, Salama SA, Arafa HM, Hamada FM, **Al-Hendy A**. Adenovirus-mediated delivery of a dominant-negative estrogen receptor gene in uterine leiomyoma cells abrogates estrogen- and progesterone-regulated gene expression. *J Clin Endocrinol Metab*. 2007 Oct;92(10):3949-57.

Wentz M, Shi L, Shi S, Salama S, Harirah HM, Fouad H, Garfield R and **Al-Hendy A**. Treatment with an inhibitor of catechol-O-methyltransferase activity reduces preterm birth and impedes cervical resistance to stretch in pregnant rats. *Reproduction* 2007 Dec, 134 (6): 831-9.

Othman E, Hornung D, Salem H, Khalifa E, El-Metwally T and **Al-Hendy A**. Serum cytokines as potential biomarkers for non-surgical prediction of endometriosis. *Eur J Ob Gyn Reprod Biol* 2008 Apr; 137(2):240-6

Salih S, Salama S, Jamaluddin M, Fadl A, Nagamani M, and **Al-Hendy A**. Progesterone-mediated regulation of Catechol-O-Methyl Transferase (COMT) Expression in Endometrial Cancers Cells. *Reproductive Sciences* 2008 Feb;15(2):210-20.

Zhang D, Zoma W, Fouad H, Salama S, and **Al-Hendy A**. Expression of Stem & Germ Cells Markers within Non-Follicle Structures in Ovaries from Adult Mice. *Reproductive Sciences* 2008 Feb; 15(2): 139-146.

Ghadami M, Salama SA, Khatoon N, Chilvers R, Nagamani M, Chedrese PJ, **Al-Hendy A**. Toward gene therapy of primary ovarian failure: adenovirus expressing human FSH receptor corrects the Finnish C566T mutation. *Mol Human Reproduction* 2008 Jan; 14(1) 9-15.

Hassan M, Khatoon, N. Curiel DT, Hamada FM, **Al-Hendy A**. Toward gene therapy of uterine fibroids: targeting modified adenovirus to human leiomyoma cells *Human Reproduction* 2008 March; 23 (3):514-24.

Azab SS, , Salama SA, Hassan MH, Khalifa AE, El-Demerdash E, Fouad H, **Al-Hendy A**, Abdel-Naim AB. 2-Methoxyestradiol reverses doxorubicin resistance in human breast tumor xenograft. *Cancer Chemotherapy & Pharmacology* 2008 Oct;62(5):893-902.

Othman E, **Al-Hendy A**. Molecular genetics racial disparities of uterine leiomyomas. *Best Pract Res Clin Obstet Gynaecol*. 2008 Aug; 22(4):589-601

Hassan M. Eyzaguirre E, MD; Arafa H, Hamada F, Salama S, and **Al-Hendy A**. Memy I: a novel murine model for uterine leiomyoma using adenovirus-enhanced human fibroid explants in severe combined immune deficiency mice. *Am J Obstet Gynecol* 2008 Aug; 199(2): 156.e1-8.

Xu X, Othman Eel-D, Hornung D., **Al-Hendy A**., and Veenstra TD. Multiplexed quantitation of endogenous estrogens and estrogen metabolites in human peritoneal fluid. *Electrophoresis* 2008 Jun;29(12):2706-13.

Salama SA, Kamel M, Awad M, Nasser AH, **Al-Hendy A**, Botting S, Arrastia C. Catecholestrogens induce oxidative stress and malignant transformation in human endometrial glandular cells: Protective effect of catechol-O-methyltransferase. *International J Cancer*, 2008 Sep 15;123(6):1246-1254.

Othman E, Curiel D, Khatoon N, Salem H, Khalifa E, **Al-Hendy A**. Towards gene therapy of endometriosis: Transductional and transcriptional targeting of adenoviral vectors to endometriosis cells. *Am J Obstet Gynecol* 2008 Aug;199(2):117.e1-6.

Essam Othman, Daniela Hornung, Ayman **Al-Hendy**. Biomarkers of Endometriosis. *Expert Opinion on Medical Diagnostics*. 2008 July; 2(7): 741-752.

Heo MY, Salama S, Khatoon N, **Al-Hendy A**, Au W.: Abrogation of estrogen receptor signaling augments cytotoxicity of anticancer drugs on CaSki cervical cancer cells. *Anticancer Research*, 2008 July-August;28(4B): 2181-7.

Salih S, Salama S, Fadl A, Nagamani M and **Al-Hendy A**. Expression and cyclic variations of catechol-O-methyl transferase in human endometrial stroma. *Fertility & Sterility* 2008 Sept. 90(3): 789-797.

Azab SS, Salama SA, Abdel-Naim AB, Khalifa AE, El-Demerdash E, **Al-Hendy A**. 2-Methoxyestradiol and multidrug resistance: can 2-methoxyestradiol chemosensitize resistant breast cancer cells? **Breast Cancer Research & Treatment** 2009 Jan;113(1):9-19.

Hassan M, Salama S, Walker C and **Al-Hendy A**. Gene Therapy of Uterine Fibroids: HSV Thymidine kinase/Ganciclovir treatment shrinks uterine leiomyoma lesions in Eker rat. **Obstetrics Gynecologic Investigations** 2009 Mar 27;68(1):19-32.

Hassan M, Salama S, Zhang D, Arafa H, Hamada F, Faoud H, Walker C, **Al-Hendy A**. Gene therapy targeting Leiomyoma: Adenovirus mediated delivery of dominant negative estrogen receptor gene shrinks uterine tumors in Eker rat model. **Fertility and Sterility** 2009 Jan 8 [Epub ahead of print].

Hussein M Atta, Mahmoud A El-Rehany, Mieke Dewerchin, Salama R Abdel Raheim, Hend Abdel Ghany, Rasha Fouad, Ayman **Al-Hendy** Adenovirus-mediated Overexpression of Human Tissue Plasminogen Activator Prevents Peritoneal Adhesion Formation/Reformation in Rats. **Surgery** (In Press)

Atta HM, **Al-Hendy A**, Salama SA, Shaker OG, Hammam OA. Low-dose simultaneous delivery of adenovirus encoding hepatocyte growth factor and vascular endothelial growth factor in dogs enhances liver proliferation without systemic growth factor elevation. **Liver Int.** 2009 Jun 3. [Epub ahead of print]

Hassan Harirah, Chandrasekhar Thota, Melissa J. Wenta, Wahiduz Zaman and Ayman **Al-Hendy** Elevated Expression of Catechol-O-methyltransferase is associated with active labor and increased PGE2 production by human fetal membranes. **Am J Obstetrics and Gynecology** (In Press)

Book Chapters, Letters, and Case Reports

Ismail N, Hortelano G, **Al-Hendy A**. Growth hormone gene therapy using encapsulated myoblasts. In: Kuhlreber WM, Lanza RP, eds *Cell Encapsulation and Therapeutics*. Boston: Birkhauser; 1999.

Al-Hendy A. Enriching research culture in residency. *Am J Obstet Gynecol.* 1999;181:1271.

Al-Hendy A, Olatunbosun F, Radhi J. Struma Ovarii. *Journal of the Society of Obstetricians and Gynecologists of Canada.* 1999;21:1336–1337.

Al-Hendy A. and Salama S. Gene Therapy in Gynecology, in **Reproductive Endocrinology: A Molecular Approach**, P.J. Chedrese, editor. 2009, pp450. Springer. ISBN 978-0-387-88185 (In press)

Memy Hassan, Essam Othman, Hornung D and Ayman **Al-Hendy**. Gene Therapy of Benign Gynecological diseases. **Advances in Drug Delivery Reviews** 2009 May 13 [Epub ahead of print]

Samar Azab SS, El-Demerdash E, and **Al-Hendy A**. Multi-drug resistance as Problem challenging Breast Cancer Chemotherapy. In "**Breast Cancer: Causes, Diagnosis, and Treatment**", Frank Columbus, PhD, Editor-in-Chief, Nova Science Publishers, Inc. (In Press).

C. Research Support

Ongoing Research Support

R01 HD046228 Al-Hendy (PI) NIH/NICHD 09/24/2003–07/31/2009 (NCE)
Estrogen Dependency of Uterine Leiomyoma

The major goals of this project are to develop novel gene therapeutics for uterine fibroids.

U54 HD044315-05 Nowicki (PI) NIH/NICHD 11/01/2007-08/31/2009 (NCE)

Cooperative Center for Research in Reproduction

Role: PI, Project II: The effect of Oral Contraceptives and Endogenous Sex Steroids on uterine leiomyoma

1 KL 2RR 024977, Bernard (PI) NCRR/CTSA 09/01/2007 – 08/31/2012

Vanderbilt Institute for Clinical and Translational Research. Role: Member, Scientific Review Committee.

ZPU-305 Al-Hendy (PI) Repros Therapeutics Inc. 07/01/2008-06/30/2011

A Phase III, open-label, Parallel, Randomized multicenter study evaluating the safety of 25, and 50 mg Proellex (CDB-4124) in the treatment of premenopausal women with symptomatic uterine fibroids.

Completed Research Support

R21 HD046639 Al-Hendy (PI) NICHD 05/05/2005–04/30/2008

Reversal of Infertility in Ovarian Failure

The major goals of this project are: Specific Aim 1: Construct and propagate two adenoviral vectors expressing FSHR (Ad-FSHR). Specific Aim 2: Express FSHR in COS and granulosa cell lines using adenovirus. Specific Aim 3: Reverse ovarian failure in FORKO mice and render them fertile via in vivo delivery of Ad-FSHR.

M01-391 Al-Hendy (PI) Tap Pharmaceuticals 07/08/2003–12/31/2007

A Phase III; 12 Month; Randomized; Double-Blind Study to Evaluate the Efficacy and Safety (including Bone Density Assessment) of Two Doses of J867 Versus Placebo in Subjects with Uterine Leiomyomata
The major goal of this project was to evaluate the efficacy and safety (including bone density assessment) of two doses of j867 versus placebo in subjects with uterine leiomyomata.

58-3148-5-124 AI-Hendy (PI)

09/30/2005–09/30/2007

USDA/US-Egypt Joint Board on Scientific and Technological Cooperation

Adenoviral Transfer of Tissue-Type Plasminogen Activator Gene Prevention for Postoperative Adhesions.