

# CURRICULUM VITAE

STEPHANIE A. PANGAS, PHD

## Personal Statement

The negative impact that reproductive disorders have on women's overall health and well-being is largely underappreciated. I have spent the majority of my 20-year scientific career researching female reproductive biology and mechanisms controlling ovarian function. I have made key discoveries at each stage. This includes pioneering the use of biomaterials as three-dimensional scaffolds for the *in vitro* development of ovarian follicles during my graduate studies at Northwestern University. Following this, as a postdoctoral fellow at Baylor College of Medicine (BCM) and now as a PI of my independent laboratory, I have generated and analyzed over 30 knockout or conditional knockout mouse models, including single, double, and triple knockouts for the ligands, receptors, transcription factors, or negative regulatory proteins that function within the TGF $\beta$  family signal transduction cascade. These mouse models have phenotypes that range from fertility disorders to ovarian cancer and provided valuable insight into disease formation in humans. I have a clear track record of success in obtaining external funding, which includes a R01 funding from the National Cancer Institute and the National Institute of Child Health and Human Development.

Research is just one component of my academic career and I have always believed that leadership, mentoring, and community service are integral parts of academic life. I have been a member of a number of study sections for various national and international grant agencies that fund reproductive biology research, including the NIH, NASA, and the Research Council UK. I am involved with the major US scientific society in Reproductive Biology (the Society for the Study of Reproduction) and continue to serve on the Development and Program Committees for their annual meetings. Reproductive Sciences has a long and storied history at BCM. As part of this tradition, I recently received funding for a new NIH T32 (training grant) for postdoctoral fellows and graduate students in Reproductive Biology. I act as course director for multiple classes, including "Frontiers in Reproductive Sciences", which I redesigned in 2017. I am committed to the training of women and under-represented minorities in science, and I am currently the Co-Director for the NIH funded R25 IMSD (Initiative for Maximizing Student Development) and faculty mentor for the Hispanic Women in Science student group and SACNAS chapter at BCM. These along with other activities have given me a well-rounded career in biomedical sciences and reproductive biology. My mission is to continue to lead in the basic science research that will advance the knowledge in reproductive biology necessary to make strides towards improving women's lives.

## I. GENERAL BIOGRAPHICAL INFORMATION

### A. Personal

Full Name: STEPHANIE A. PANGAS, Ph.D.

Citizenship: USA

### B. Education

Kent State University, B.A. with Honors, 1986-1990, Kent, OH, Anthropology & Sociology

Northwestern University, M.S., 1993-1995, Evanston, IL, Biochemistry, Molecular Biology & Cell Biology.

Advisor, Richard I. Morimoto, Ph.D.

Northwestern University, Ph.D., 1999-2002, Evanston, IL, Neurobiology & Physiology

Thesis: Signaling systems in ovarian follicle development.

Advisor, Teresa Woodruff, Ph.D.

Baylor College of Medicine, Postdoctoral Fellowship 2002-2007, Pathology & Immunology  
Advisor: Martin M. Matzuk, M.D., Ph.D.

### **C. Academic Appointments**

Assistant Professor (tenure-track), Baylor College of Medicine, 2007-2014  
Primary Appointment: Department of Pathology & Immunology  
Secondary Appointment: Molecular & Cellular Biology

Associate Professor (tenure-track), Baylor College of Medicine, 2014-2016  
Primary Appointment: Department of Pathology & Immunology  
Secondary Appointment: Molecular & Cellular Biology

Associate Professor (tenured), Baylor College of Medicine, 2016-present  
Primary Appointment: Department of Pathology & Immunology  
Secondary Appointment: Molecular & Cellular Biology

Co-Director, Initiative for Maximizing Student Development (IMSD) Program 2017-present  
Baylor College of Medicine

Director, Comprehensive Mechanisms of Reproductive Sciences (T32), 2020-present,  
Baylor College of Medicine

Roger Rossen Endowed Professor of Reproductive Pathology, 2019-present, Dept. of Pathology &  
Immunology, Baylor College of Medicine

### **D. Awards and Honors**

Pi Gamma Mu International Honor Society in the Social Sciences, 1989

Golden Key National Honor Society, 1990

Graduated *Magna cum laude*, Kent State University, 1990

Outstanding Undergraduate in Anthropology and Sociology, Kent State University, 1990

McGraw-Hill Award for Academic Achievement, Kent State University, 1990

Honorable Mention, National Science Foundation Graduate Research Fellowship, 1992

NIH Program in Endocrinology, Diabetes and Hormone Action Training Grant, Pre-doctoral Fellowship,  
Northwestern University, 1999-2002

NIH Center for Reproductive Biology Training Grant, Post-doctoral Fellowship, Baylor College of  
Medicine, 2002-2004

Contraception and Infertility Loan Repayment Grant, National Institutes of Health, 2004-2007

Lalor Foundation Merit/Travel Award, Society for the Study of Reproduction, 2005

Duncan Scholar, Dan L. Duncan Cancer Center, Baylor College of Medicine, 2007-2009

SSR New Investigator Award, Society for the Study of Reproduction, 2013

Fulbright & Jaworski L.L.P Faculty Excellence Award (Teaching and Evaluation), 2015

Baylor College of Medicine "Women of Excellence" Award, 2018

## **II. RESEARCH INFORMATION**

### **A. Research Support (Chronological)**

#### **ACTIVE RESEARCH SUPPORT**

“Protein Sumoylation in Oocyte Development”

National Institutes of Health, National Institute of Child Health and Human Development

1R01 HD085995-01A1

Role: PI

02/01/2017 - 01/31/2022

Annual Direct Cost \$207, 500

Total Direct Costs: \$1,037,500

“Initiative for Maximizing Student Development (IMSD) Program”

NIH-NIGMS

R25 GM056929 (PD: Pereira, F)

Role: Co-Director (5% Salary Support) and Program Faculty

03/01/1998-01/31/2021

Annual Direct Costs: \$572,893

Total Direct Cost: \$2,864,465

"Comprehensive Mechanisms in Reproductive Sciences Training Grant"

National Institutes of Health, National Institute of Child Health and Human Development

T32 HD098068-01A1

Role: PD/PI

5/01/2020-4/30/2025

Annual Direct Cost: \$353,756

Total Direct Cost: \$2,102,070

**COMPLETED RESEARCH SUPPORT**

“The Role of Tudor Domain Protein 1 in Mouse Germ Cells”

National Institutes of Health, National Institute of Child Health and Human Development

NRSA F32 HD046335

Role: PI

09/01/2004 – 08/31/2007

Annual Direct Cost: \$47,348

Overall Direct Cost: \$142,044

“The Role of BMP Signaling in Cancer”

Caroline Weiss Law Fund for Molecular Medicine and the L.E. and Josephine S. Gordy Memorial Cancer Research Fund

Role: PI

12/01/2008 - 11/30/2009

Annual Direct Cost: \$50,000

Total Direct Cost: \$50,000

Burroughs Wellcome Fund

Career Awards in Biomedical Sciences

“Defining the Role of the TGF $\beta$  Superfamily in Ovarian Cancer through Mouse Models”

Role: PI

09/01/2006 – 8/31/2013

Annual Direct Cost: Postdoctoral (Year 1) \$70,000

Faculty (Year 2-4) \$110,000

Total Direct Cost: \$400,000

“Role of The BMP SMADs In Oncogenesis”

National Institutes of Health, National Cancer Institute  
R01 CA138628  
Role: PI  
07/01/2010-12/31/2015  
Annual Direct Cost: \$212,849  
Total Direct Cost: \$1,204,217

“Novel Diagnostics for Early Stage Ovarian Cancer”  
Susan Poorman Blackie Ovarian Cancer Foundation  
Role: PI  
07/01/2014 – 06/30/2016  
Annual Direct Cost: \$30,000  
Total Direct Cost: \$60,000

"TGF $\beta$  SMAD and Non-SMAD Signaling in Juvenile Granulosa Cell Tumors"  
Baylor College of Medicine  
Interim Funding  
Role: PI  
01/01/2015-06/30/2016  
Total Direct Cost: \$100,000

“Mechanisms Controlling Divergent Fates of Ovarian Follicles and Fertility”  
National Institutes of Health, National Institute of Child Health and Human Development  
R01 HD076980-01 (J. Richards, PI)  
Role: Co-I (5% salary support)  
04/01/14 – 03/31/19  
Total Direct Cost: \$1,138,370

"Developing a non-invasive diagnostic test for early stage ovarian cancer"  
Gilson Longenbaugh Foundation  
Role: PI  
08/15/2015-12/31/2017  
Total Direct Cost: \$40,000

"Early Detection of Ovarian Cancer"  
Cancer Fighters of Houston  
Role: PI  
11/6/2016-12/31/2017  
Total Direct Cost: \$50,000

## **B. National Scientific Participation**

### **Journal Editorial Boards**

*Systems Biology in Reproductive Medicine*, Associate Editor, 2012-2020  
*Molecular Human Reproduction*, Associate Editor, 2009-2013  
*Biology of Reproduction*, Reviewing Editor, 2014-2019  
*Biology of Reproduction*, Associate Editor, 2021-present  
*Cell and Tissue Research*, Section Editor, Female Reproductive Biology 2021-present

### **Journal Ad hoc Reviewer**

*Biology of Reproduction*, *Cell and Tissue Research*, *Development*, *Developmental Biology*, *E-Biomedicine*, *Endocrinology*, *Human Reproduction*, *Human Reproduction Update*, *Journal of Molecular*

*Endocrinology, Molecular Endocrinology, Molecular and Cellular Endocrinology\*, Molecular Human Reproduction, Molecular Reproduction and Development, Nature Cell Biology, New England Journal of Medicine, PLoS One, Proceedings of the National Academy of Sciences, Reproduction, Reproductive Biology and Endocrinology*

\*2015 Outstanding Contribution in Reviewing Certificate

### **Meeting Abstract Reviewer**

Society for the Study of Reproduction, Annual Meeting, 2011, 2014, 2016

European Society of Human Reproduction and Embryology, Annual Meeting 2012-present

Texas Forum for Reproductive Sciences, 2015-present (Abstract, Platform and Poster Reviewer)

### **Review Panels, Funding Agencies**

Reviewer National Science Foundation, 2007

Reviewer Israeli Science Foundation, 2010

Reviewer Marsden Fund (New Zealand), 2010, 2013

Reviewer NIH/RPG Specialized Cooperative Centers Program in Reproduction and Infertility Research, 2011

Reviewer NASA Spaceflight Research Opportunities in Space Biology, Developmental Biology Panel, 2014

Reviewer NIH/NIEHS Special Emphasis Panel ZES1 JAB-D, 2015

Reviewer NASA "Human Exploration Research Opportunity (HERO)" Review Panel, 2015

Member NIH/NICHD Reproduction, Andrology, and Gynecology (RAG) Subcommittee 2015-2019

Reviewer RCUK, Biotechnology and Biological Sciences Research Council (BBSRC) (United Kingdom), 2015-2017

Reviewer NIH/NIEHS Special Emphasis Panel ZES1 JAB-S R1 1, 2017

Reviewer NIH/NIEHS Special Emphasis Panel ZES1 JAB-D (V) 1, 2017

Member Pilot and Scholar Award Review Committee, Rivkin Center for Ovarian Cancer, 2017-20

Reviewer NIH/NICHD Cellular, Molecular, and Integrative Reproduction Study Section (CMIR) (Ad hoc) Oct 2019

Reviewer NIH/NICHD Cellular, Molecular, and Integrative Reproduction Study Section (CMIR) (Ad hoc) Feb 2020

Reviewer NIH/NICHD Special Emphasis Panel ZRG1 EMNR-V, July 2020

Reviewer NIH/NICHD Special Emphasis Panel ZHD1 DSR-R (92) 1, Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grant (Parent T32), 2020

Reviewer NIH/NICHD Special Emphasis Panel ZRG1 F06-V (20) L, Fellowships: Endocrinology, Metabolism, Nutrition and Reproductive Science, Nov 18, 2020

Reviewer NIH/NICHD Special Emphasis Panel ZHD1 DSR-Z (02) M, Developmental Biology, 07/21/2021

### **National Service**

Member, FASEB Excellence in Science Award Committee, Endocrine Society, 2014-2017

Member Women in Reproductive Science (WinRS), Awards Committee, Society for the Study of Reproduction, 2015-2017

Member Program Committee, Annual Meeting of the Society for the Study of Reproduction, 2017 Washington, DC

Mentor NIH program "Personalized Feedback on Your Grant Application", NIH Campus, 2017

Reviewer NIH "Mock Review Session" for Trainees and Junior Faculty, Annual Meeting of the Society for the Study of Reproduction, New Orleans, LA, 2018

Member Organizing Committee, Texas Forum for Reproductive Sciences (2019-present)

Member Women in Reproductive Sciences Sub-Committee, Society for the Study of Reproduction, 2020-present

- Panelist “How to Survive a Shut Down: Advice for Early Career Researchers”, Society for Reproductive Investigation, February 2021
- Member Program Committee, Annual Meeting of the Society for the Study of Reproduction, 2021, St. Louis, MO

**Membership in Professional Societies**

Society for the Study of Reproduction, 1999-present  
Endocrine Society, 2009-present

**External Advisor Board**

Judy's Mission (Houston, TX), 2016-present

**National Invited Lectures, Presentations, and Research Seminars**

1. Minisymposium, Annual Meeting of the Society for the Study of Reproduction  
“*The TGF $\beta$  superfamily in ovarian follicle development*”  
Omaha, NE, July 29-Aug 1 2006
2. Department of Biology Seminar Series, University of Pennsylvania  
“*Defining the role of the TGF $\beta$  family in ovarian cancer through mouse models*”  
Philadelphia, PA, October 19, 2006
3. Department of Molecular Genetics Research Forum Seminar, M.D. Anderson Cancer Center  
“*SMAD signaling in reproduction and gonadal cancer*”  
Houston, TX, January 8, 2007
4. Cancer Biology Seminar Series, McArdle Laboratory for Cancer Research, University of Wisconsin, Madison  
“*SMAD function in reproduction and gonadal cancer*”  
Madison, WI, February 13, 2007
5. Baker Institute for Animal Health Seminar Series, Cornell University  
“*SMAD function in gonadal physiology and cancer*”  
Ithaca, NY, April 26, 2007
6. Grand Rounds, Department of Obstetrics and Gynecology, Baylor College of Medicine  
“*Genetic models of ovarian cancer*”  
Houston, TX, May 23, 2007
7. Speaker, Reproductive Scientist Development Program Scholars’ Research Conference  
“*Modeling SMAD function in fertility and cancer*”  
Boulder CO, September 14-16, 2007
8. Cancer Biology/Molecular Carcinogenesis Joint Program Research Retreat, Dan L. Duncan Cancer Center  
“*A murine model for metastatic sex cord stromal tumors*”  
Houston, TX, February 21, 2008
9. Cancer Biology Program Seminar Series, Baylor College of Medicine  
“*TGF $\beta$  function in fertility and reproductive cancers.*”  
Houston, TX, November 10, 2008

10. Speaker, Keystone Symposium on Frontiers in Reproductive Biology and Regulation of Fertility  
“*Genetic Models of Smad Function in Reproduction*”  
Santa Fe, NM, February 1-6, 2009
11. Magee-Women’s Research Institute Work-in-Progress Seminar Series  
“*Reproductive Function of the TGF $\beta$  family Signal Transduction Pathways*”  
Pittsburgh, PA, March 8, 2011
12. Cancer Biology Program, Dan L. Duncan Cancer Center, Baylor College of Medicine  
“*SMAD regulation of PDGF in granulosa cell tumors of the ovary*”  
Houston, TX, January 9, 2011
13. Minisymposium, 94<sup>th</sup> Annual Meeting of the Endocrine Society  
“*The role of BMP antagonism on primordial follicle assembly*”  
Houston, TX, June 23-26, 2012
14. Molecular & Cellular R&D Seminar Series, Baylor College of Medicine  
“*Ovarian function of the TGF $\beta$  family signal transduction pathways*”  
Houston, TX, March 29, 2012
15. Reproductive Biology Seminar Series, University of Texas Southwestern Medical School  
“*Ovarian function of the TGF $\beta$  family signal transduction pathways*”  
Dallas, TX, October 9, 2012
16. Reproductive Biology Seminar Series, University of Missouri  
“*BMP signaling and ovarian function*”  
Columbia, MO, October 31, 2012
17. Department of Integrative Biology and Pharmacology Seminar Series, University of Texas Health Sciences Center Medical School  
“*Bone morphogenetic proteins in ovary development and function*”  
Houston, TX, December 12, 2012
18. Department of Molecular and Integrative Physiology Seminar Series, University of Michigan,  
“*The transforming growth factor  $\beta$  family in the female reproductive tract*”  
Ann Arbor, MI, November 4, 2013.
19. Department of Molecular & Cellular Biology, Center for Reproductive Medicine Seminar Series, Baylor College of Medicine, “*Novel determinants of the ovarian reserve and female fertility*”, Houston TX, December 11, 2014.
20. Magee-Women’s Research Institute Work-in-Progress Seminar Series  
“*New models to study the ovarian reserve and regulation of female fertility*”  
Pittsburgh, PA, May 12, 2015.
21. Society for the Study of Reproduction Annual Meeting, Oral Presentation  
“*Gremlin-1 and Gremlin-2 are required for development of the ovarian architecture and establishing oocyte numbers in mice*”  
San Diego, CA, July 16-20, 2016.
22. Department of Pathology & Immunology Research Series, Baylor College of Medicine,  
“*Novel determinants of female fertility*”

Houston, TX, November 4, 2016.

23. Department of Obstetrics & Gynecology Science Friday, Baylor College of Medicine,  
“*New concepts in oogenesis: SUMOylation as a mechanism regulating oocyte transcription factor cascades*”  
Houston, TX, October 27, 2017
24. Department of Pathology & Immunology Research Series, Baylor College of Medicine,  
“*SUMOylation in oocyte development*”  
Houston, TX, Sept 28, 2018
25. Interdisciplinary Faculty of Reproductive Biology Seminar Series, School of Veterinary Sciences, Texas A&M  
“*Wrestling with Reproduction: Novel Roles of Protein SUMOylation in Oocyte Development*”;  
College Station, TX, Feb 8, 2019.
26. Buck Institute on Aging Faculty Seminar  
“*Mouse Models to Study Fertility and Reproductive Lifespan: New Players in Mammalian Oogenesis*”,  
Novato, CA, March 5, 2019.
27. Center for Reproductive Health Sciences Seminar, Dept. of Obstetrics & Gynecology, Washington, University  
“*Mouse Models to Study Reproduction: New Players in Mammalian Oogenesis*”  
St. Louis, MO May 16-17, 2019.
28. Society for the Study of Reproduction Annual Meeting, Invited Talk  
“*Protein SUMOylation is essential for oocyte development in mice*”  
San Jose, CA, July 18-21, 2019.
29. From Preconception to the Cradle 1<sup>st</sup> inaugural meeting, Invited Talk.  
“*Mammalian Models of Female Fertility and Reproductive Lifespan*”  
Houston, TX, Nov. 11-12, 2019.
30. Division of Reproductive Sciences Seminar Series, Dept. of Obstetrics, Gynecology, & Reproductive Sciences, Yale University School of Medicine Invited Talk.  
“*Novel Roles of Protein SUMOylation in Oocyte Development*”  
New Haven, CT, Nov. 20-21, 2019
31. Dept. of Pathology & Immunology Research Conference, BCM  
“*Mouse models for ovary development, function, and disease*”  
Houston, TX, Dec 6, 2019
32. Reproductive Developmental Biology Laboratory Seminar Series, National Institute of Environmental Health Sciences, Invited Talk.  
“*Regulation of Oocyte Development through Protein SUMOylation*”  
Research Triangle Park, NC, January 17-19, 2020
33. Texas Forum for Reproductive Sciences, Plenary Speaker  
Title: TBD  
Houston, TX, April 2020 (Delayed until 2021 due to COVID-19)
34. 17<sup>th</sup> Annual Gilbert S. Greenwald Symposium, Plenary Speaker  
Title: TBD



Kansas City, KS Oct 8-9, 2020 (Delayed until 2021 due to COVID-19)

### International Invited Lectures, Presentations, and Research Seminars

1. Minisymposium, 12<sup>th</sup> International Congress on Gynecological Endocrinology  
“*TGF $\beta$  superfamily regulation of ovarian folliculogenesis*”  
Florence, Italy, March 2-5, 2006
2. Department of Cellular and Molecular Medicine Seminar Series, University of Ottawa  
“*SMAD function in female fertility and cancer*”  
Ottawa Canada, November 2, 2007
3. Speaker, TGF $\beta$  Down Under Conference  
“*Regulation of folliculogenesis and granulosa cell differentiation by the TGF $\beta$ B family during postnatal ovary development*”  
Melbourne, VC, Australia, March 20-22, 2011
4. Speaker, RQR Annual Symposium, University of Montreal, Center for Research on Animal Reproduction,  
“*Ovarian Function of the TGF $\beta$  family Signal Transduction Pathways*”  
Montreal, Quebec, Canada, November 14-16, 2011
5. SSR New Investigator Award Lecture, Society for the Study of Reproduction Annual Meeting,  
“*The TGF $\beta$  family as central mediators of growth and differentiation of the ovarian follicle*”  
Montreal, Quebec, Canada, July 22-25, 2013.
6. Exchange Lecture: SSR New Investigator, Society for Reproduction and Fertility Annual Meeting,  
“*The TGF $\beta$  family in ovary development and cancer*”  
Edinburgh, Scotland September 1-2, 2014

### Peer-Reviewed Publications (Non-BCM)

1. Jurivich, D.A., **Pangas, S.A.**, Qui, L., and J.F. Welk (1996). Phospholipase A2 triggers the first phase of the thermal stress response and exhibits cell-type specificity. J. of Immunology 157: 1669-1675.
2. Chong, H., **Pangas, S.A.**, Bernard, D.J., Wang, E., Gitch, J., Chen, W., Draper, L.B., Cox, E.T. and T.K. Woodruff (2000). Structure and expression of a membrane component of the inhibin receptor system. Endocrinology 141: 2600-2607. PMID: 10875264
3. **Pangas, S.A.**, and T.K. Woodruff (2000). Activin Signal Transduction Pathways. Trends in Endocrinology and Metabolism 11: 309-314. PMID: 10996525
4. **Pangas, S.A.**, and T.K. Woodruff (2002). Production and purification of recombinant human inhibin and activin. J. Endocrinol. 172:199-210. PMID: 11786387
5. **Pangas, S.A.**, Rademaker, A.W., Fishman, D.A., and T.K. Woodruff (2002). Localization of the activin signal transduction components in human ovaries: implications for autocrine and paracrine signaling in the ovary. J. Clin. Endocrinol. Metab. 87:2644-2657. PMID: 12050229
6. **Pangas, S.A.** and T.K. Woodruff (2002). Physiology and pathophysiology of inhibin. Clin. Laboratory Invest. 26:14-17.

7. **Pangas S.A.**, Saudye, H., Shea, L., and T.K. Woodruff (2003). Granulosa cell-oocyte complex growth and maturation in a novel three-dimensional environment. *Tissue Engineering* 9: 1013-1021. PMID: 14633385

#### Peer-Reviewed Publications (BCM)

1. **Pangas, S.A.** and M.M. Matzuk (2004). Genetic models for transforming growth factor- $\beta$  superfamily signaling in ovarian follicle development. *Mol. Cell. Endocrinol.* 225:83-91. PMID: 15451572 (Review)
2. **Pangas, S.A.**, Jorgez, C.J., and M.M. Matzuk (2004). Growth differentiation factor 9 regulates expression of the bone morphogenetic protein antagonist, gremlin. *J. Biol. Chem.* 279: 32281-32286. PMID: 15133038
3. Rajkovic, A., **Pangas, S.A.**, N., Ballow, D., Suzumori, N., and M.M. Matzuk (2004). NOBOX regulates oocyte-specific gene expression in early folliculogenesis. *Science* 305: 1157-1159. PMID: 15326356
4. **Pangas, S.A.**, Yan, W., Matzuk, M.M., and A. Rajkovic (2004). Restricted germ cell expression of a gene encoding a novel mammalian HORMA domain containing protein. *Gene Expr. Patterns* 5:257-263. PMID: 15567723
5. McKenzie, L.J., **Pangas, S.A.**, Carson, S.A., Kovanci, E., Cisneros, P., Buster, J.E., and M.M. Matzuk (2004). Human granulosa cell gene expression: a predictor of fertilization and embryo selection in women undergoing in vitro fertilization. *Human Reprod.* 19:2869-2874. PMID: 15471935
6. Yan, W., Ma, L., Stein P., **Pangas, S.A.**, Burns K.H., Bai Y., Schultz, R.M., and M.M. Matzuk (2005). An oocyte-specific oligoadenylate synthetase-like protein, OAS1D, inhibits the interferon/oligoadenylate synthetase/RNase L-mediated pathway in mouse oocytes. *Mol. Cell. Biol.* 25:4615-4624. PMID: 15899864
7. **Pangas, S.A.** and M.M. Matzuk (2005). The art and artifact of GDF9 activity: cumulus expansion and the cumulus expansion-enabling factor. *Biol. Reprod.* 73:582-5. PMID: 15917343 (Review)
8. **Pangas, S.A.**, Choi, Y, Ballow D., Zhao Y., Westphal H., Matzuk, M.M., and A. Rajkovic (2006). Oogenesis requires germ cell specific transcriptional regulators *Sohlh1* and *Lhx8*. *Proc. Natl. Acad. Sci.(USA)* 103:8090-8095. PMID: 16690745
9. **Pangas, S.A.**, Li, X., Robertson, E.J., and M.M. Matzuk (2006). Premature luteinization and ovarian failure in ovary-specific *Smad4* conditional knockout mice. *Mol. Endocrinol.* 20:1406-1422. PMID: 16513794
10. Ballow, D.J., Xin Y, **Pangas, S.A.**, and A. Rajkovic (2006). SOHLH2 is a germ cell specific HLH transcription factor. *Gene Expr. Patterns* 6:1014-1018. PMID: 16765102
11. **Pangas, S.A.** and A. Rajkovic (2006). Transcriptional regulation of early oogenesis: in search of masters. *Human Reprod. Update* 12:65-76. PMID: 16143663 (Review)
12. Sugiura K., Su, Y-Q., Diaz, F.J., **Pangas, S.A.**, Sharma, S., Wigglesworth, K., O'Brien, M.J., Matzuk, M.M., Shimasaki, S., and J.J. Eppig (2007). Oocyte-derived BMP15 and FGFs cooperate to promote glycolysis in companion cumulus cells. *Development* 134:2593-2603. PMID: 17553902
13. Suzumori, N., **Pangas, S.A.**, and A. Rajkovic (2007). Candidate genes for premature ovarian failure. *Curr. Med. Chem.* 14:353-357. PMID: 17305537 (Review)

14. **Pangas, S.A.**, Jorgez, C., Tran, M., Agno, J., Li, X., Brown, C.J., Kumar, T.R., and M.M. Matzuk (2007). Intraovarian activins are required for female fertility. *Mol. Endocrinol.* 21:2458-2471. PMID: 17609433
15. **Pangas, S.A** (2007). Growth factors in ovarian development. *Semin. Reprod. Med.* 25:225-234. PMID: 17594603 (Review)
16. Su, Y.-Q., Sugiura, K., Wigglesworth, K., O'Brien, M.J., Affourtit, J.P., **Pangas, S.A.**, Matzuk, M.M., and J.J. Eppig (2008). Oocyte regulation of metabolic cooperativity between mouse cumulus cells and oocytes: BMP15 and GDF9 control cholesterol biosynthesis in cumulus cells. *Development* 135:111-121. PMID: 18045843
17. **Pangas, S.A.**, Li X., Umans, L., Zwijzen, A., Huylebroeck, D., Gutierrez, C.C., Wang, D., Martin, J.F., Jamin, S.P., Behringer, R.R., Robertson, E.J., and M.M. Matzuk (2008). *Smad1* and *Smad5* conditional knockout mice develop metastatic gonadal tumors. *Mol. Cell. Biol.* 28:248-257. PMID: 17967875
18. Li, Q., **Pangas, S.A.**, Jorgez, C.J., Graff, J.M., Weinstein, M., and M.M. Matzuk (2008). Redundant roles of SMAD2 and SMAD3 in ovarian granulosa cells in vivo. *Mol. Cell. Biol.* 28:7001-7011. PMID: 18809571
19. Myers, M., Middlebrook, B.S., Matzuk, M.M., and **S.A. Pangas** (2009). Loss of inhibin alpha uncouples oocyte-granulosa cell dynamics and disrupts postnatal folliculogenesis. *Dev. Biol.* 334:458-467. PMID 19666016
20. Middlebrook, B.S., Eldin, K.W., Li, X., Shivasankaran, S. and **S.A. Pangas** (2009). *Smad1 Smad5* ovarian conditional knockout mice develop a disease profile similar to the juvenile form of human granulosa cell tumors. *Endocrinology* 150:5208-5217. PMID 19819941
21. Myers, M. and **S.A. Pangas** (2010). New insights into the regulatory roles of TGF $\beta$  family members in folliculogenesis. *Sys. Biol. Med.* 2:117-124. (Review)
22. Edson, M.A., Clementi, C., Nalam, R.L., Franco, H.L., DeMayo, F.J., Lyons, K.M., **Pangas, S.A.**, and M.M. Matzuk (2010). Granulosa cell-expressed BMPR1A and BMPR1B have unique functions in regulating fertility but act redundantly to suppress ovarian tumor development. *Mol. Endocrinol.* 24:1251-1266. PMID 20363875
23. Nagaraja, A.K., Middlebrook, B.S., Rajanahally, S., Myers, M., Li, Q., Matzuk, M.M., and **S.A. Pangas** (2010). Defective gonadotropin-dependent ovarian folliculogenesis and granulosa cell gene expression in inhibin-deficient mice. *Endocrinology* 151:4994-5006. PMID 20739397
24. Richards, J.S. and **S.A. Pangas** (2010). The ovary: basic biology and clinical implications. *J. Clin. Invest.* 120:963-972. PMID 20364094 (Review)
25. Myers, M., Tripurani, S., Middlebrook, B.S., Economides, A., Canalis, E., and **S.A. Pangas** (2011). Loss of gremlin delays primordial follicle assembly but does not affect female fertility. *Biol. Reprod.* 85:1175-1182. PMID 21832168
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34. Mansouri-Attia, N., Tripurani, S.K., Gokul, N., Anderson, M., Eldin, K., and **S.A. Pangas** (2014). TGF $\beta$  signaling promotes granulosa cell tumorigenesis in mice and humans by suppressing apoptosis, *Mol. Endocrinol.* PMCID: PMC4213364
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37. Rodriguez, A. and **S.A. Pangas**. The role of SUMOylation in germ cell development (2016). *Cell & Tissue Research (Special Issue)* 363:47-55. PMCID:PMC4703547 (Review)
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\*Cover Photo
39. Wu, H., **Pangas, S.A.**, Eldin, K.W., Ratel, K.R., Hicks, J., Dietrich, J.E., and Venkatramani, R. (2017). Juvenile granulosa cell tumor of the ovary: a clinicopathologic study and review of the literature. *J. Pediatr Adolesc Gynecol.* 30:138-143 PMID: 27702598
40. Rajkovic, A., and **S.A. Pangas** (2017). Ovary as a biomarker of health and longevity: insights from genetics. *Semin. Reprod. Med.* 35:231-240 (Review)
41. Rodriguez, A., Briley, S.M., Patton, B.K., Tripurani, S.K., Rajapakshe, K., Coarfa, C., Rajkovic, A., Andrieux, A., Dejean, A., and **S.A. Pangas** (2019) Loss of the E2 SUMO-conjugating enzyme Ube2i in

oocytes during ovarian folliculogenesis causes infertility in mice. *Development* 146:dev176701.  
doi:10.1242/dev.176701.

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43. Cox, A.R., Chernis, N., Kim, K.H., Masschelin, P.M., Saha, P.K., Briley, S.M., Li, X., Felix, J.B., Sun, Z., Moore, D.D., **Pangas, S.A.**, and S.M. Hartig (2021). *Ube2i* deletion in adipocytes causes lipoatrophy in mice. *Mol. Metab* 48:101221. doi: 10.1016/j.molmet.2021.101221.
43. Rydze, R.T., Patton, B., Briley, S., Torralba-Salazar, H., James, R., Thompson, T., Rajkovic, A. and **S.A. Pangas** (2021). Deletion of Gremlin-2 alters estrous cyclicity and disrupts female fertility (April 2021). *Biol. Reprod.*, in press.
44. Patton, B., Madadi, S., and **S.A. Pangas**, Regulation of ovarian function. *Current Opinion in Endocrine and Metabolic Research*, in press.

### Book Chapters (Peer-Reviewed and Invited)

1. Rajkovic, A., **Pangas, S.A.**, and M.M. Matzuk (2006). Follicular development: mouse, sheep and human models. In: The Physiology of Reproduction, J.D. Neill, Ed. 3rd Edition (Elsevier Press), pp. 383-423.
2. **Pangas, S.A** and M.M. Matzuk (2007). The TGF $\beta$  family in the Reproductive Tract. In: TGF $\beta$ , R Derynck and K. Miyazono, Eds., 1st Edition (Cold Spring Harbor Press), pp. 861-888.
3. Richards, J.S and **S.A. Pangas** (2010). New insights into ovarian function. In: Handbook of Experimental Pharmacology – Contraception. U.-F. Habenicht and J. Aitken, Eds. (Springer Press), pp. 3-27.
4. Tripurani, S.K. and **S.A. Pangas** (2012). Regulation of oogenesis by oocyte-specific networks. In: Mammalian Oogenesis, G. Coticchio, L. DeSantis, and D. Albertini, Eds. (Springer Press), pp. 129-140.
5. Clementi, C., **Pangas, S.A.**, and M.M. Matzuk (2013). Growth factors and reproduction. In: *Yen and Jaffe's Reproduction*, 7<sup>th</sup> Edition, Strauss, J. and R. Barbieri, Eds. (Elsevier Press).
6. **Pangas, S.A.** and A. Rajkovic (2013). Mammalian models for follicular development. In: The Physiology of Reproduction, J.D. Neill, Ed. 4rd Edition (Elsevier Press).
7. Monsivais, D., Matzuk, M.M., and **S.A. Pangas** (2017). The TGF $\beta$  family in the Reproductive Tract: Development and Function. In: TGF $\beta$ , R. Derynck and K. Miyazono, Eds., 2nd Edition (Cold Spring Harbor Press)
8. Rodriguez, A., Matzuk, M.M., and **S.A. Pangas** (2018). Chapter 6: Growth factors and Reproduction. In: *Yen and Jaffe's Reproduction*, 8<sup>th</sup> Edition, Strauss, J. and R. Barbieri, Eds. (Elsevier Press), pp 132-148.
9. Rodriguez, A., Rydze, R.T., Briley, S., and **S.A. Pangas** (2018). Chapter 18: Transgenic mouse models in the study of ovarian function, In: *The Ovary*, 3<sup>rd</sup> Edition, Leung, P.C.K., and Adashi, E.Y., Eds., (Elsevier), pp. 295-310
10. Monsivais, D. and **S.A. Pangas** (2021) Chapter 6: Growth factors and Reproduction. In: *Yen and Jaffe's Reproduction*, 9<sup>th</sup> Edition, Strauss, J. and R. Barbieri, Eds. (Elsevier Press), submitted.

## I. TEACHING INFORMATION

### Didactic Courses (BCM)

Lecturer, "Bench to Bedside Seminar Series", Translational Biology and Molecular Biology Graduate Program, Baylor College of Medicine, 2009 (1 hour)

Lecturer, "Reproductive Biology", Molecular & Cellular Biology Graduate Program, Baylor College of Medicine, 2010-present (4 hours annually)

Instructor, "Graduate Student Seminar Series", Molecular & Cellular Biology Graduate Program, Baylor College of Medicine, Spring Term 2011 (8 hours)

Lecturer, "Graduate Student/Postdoctoral Fellow Ethics Training Course", Graduate School of Biomedical Sciences, Baylor College of Medicine, 2012-2014 (2-3 hours annually)

Lecturer, "Cancer", Graduate Program in Biomedical Sciences, Baylor College of Medicine, Fall Term 2013-current (2 hours, annually)

Lecturer, "Introduction to Molecular Carcinogenesis", Graduate Program in Biomedical Sciences, Baylor College of Medicine, Spring Term 2015-present (2 hours annually)

Lecturer, "Cells, Tissues, and Organs", Molecular & Cellular Biology Graduate Program, Baylor College of Medicine, Spring Term 2015-present (1 hour annually).

Lecturer, "Pathophysiology and Mechanisms of Human Disease", TBMM Graduate Program, Baylor College of Medicine, Spring Term 2018-present (1 hour annually)

### Course Director

"Graduate Student Seminar Series", Molecular and Cellular Biology Graduate Program, Baylor College of Medicine, (2 courses annually: Spring and Summer Terms), Baylor College of Medicine, 2014-2017.

"Cancer", Graduate School in Biomedical Sciences, Baylor College of Medicine (Fall Quarter) Co-director, 2014; Director 2015-present.

"Frontiers in Reproductive Biology", Molecular and Cellular Biology Graduate Program, Baylor College of Medicine (1 course annually), Director, 2016-present

"Reading and Evaluating Scientific Literature", Cancer and Cell Biology Graduate Program, Baylor College of Medicine (1 course annually, Winter), Co-Director, 2020-present

"NRSA Grant Writing & Project Development", Cancer and Cell Biology Graduate Program, Baylor College of Medicine (1 course annually, Winter), Co-Director, 2020-present

### Lectures (Non-BCM)

Guest Lecturer, Advances in Tissue Engineering Course, Rice University, 2007-2009  
"Bioengineering in Reproductive Biology" (1 hour).

### Research Fellow Training

Michelle Myers, Ph.D.	2007-2010; Current Position, Medical Science Liaison, NuCana PLC
Robert Cook, Ph.D.	2008-2010; Current Position, Vice President, Medical Affairs and R&D, Castle Biosciences
Krishna Jagarlamudi, Ph.D.	2012-2013; Current Position, Assistant Professor, Dept. of Biochemistry, Biocon Academy, Bengaluru, India
Swamy Tripurani, Ph.D.	2011-2013; Current Position, Senior Staff Fellow, Food and Drug Administration
Nadera Mansouri-Attia, Ph.D.	2011-2014; Current Position, Research Scientist, Bravermann IVF and Reproductive Immunology.

### Clinical Fellow Training

Sujatha Shivasankaran, M.D.	2007 Research Rotation; Current Position, Private Practice
Bradley Safro, M.D.	2007 Research Rotation; Current Position, Private Practice

### Graduate Student Training

#### Rotation Students

Yasmin Vasquez	Ph.D. Student, Molecular & Cellular Biology Program, Fall 2011 (Research)
Chrystal Loya	Ph.D. Student, Molecular & Cellular Biology Program, Fall 2012 (Research)
Amanda Rodriguez	Ph.D. Student, Molecular & Cellular Biology Program, Summer/Fall 2012 (Reading and Research)
Braden Pew	Ph.D. Student, Molecular & Cellular Biology Program, Rotation, Spring 2013 (Research)
Nisha Gokul	Ph.D. Student, Molecular & Cellular Biology Program, Rotation, Summer/Fall 2013 (Reading and Research)
Shawn Briley	Ph.D. Student, Biochemistry Graduate Program, Rotation, Spring 2017 (Research)
Bethany Patton	Ph.D. Student, Molecular & Cellular Biology Program, Rotation, Winter 2018 (Research)
Alyssa Alaniz	Ph.D. Student, Cancer & Cell Biology Program, Rotation, Summer 2019
Lauren Kelly	Ph.D. Student, Cancer & Cell Biology Program, Rotation, Fall 2019
Sydney Parks	Ph.D. Student, Cancer & Cell Biology Program, Rotation, Fall 2020
Giselle de la Torre Pinedo	Ph.D. Student, Cancer & Cell Biology Program, Rotation, Spring 2021

#### Current Students (Mentor):

Shawn Briley	Ph.D. Student, Biochemistry Graduate Program, 2017-present
Bethany Patton	Ph.D. Student, Molecular & Cellular Biology Program, 2018-present

#### Former Students (Mentor):

Amanda Rodriguez	Molecular & Cellular Biology Program, 2013-2018 Current Position: Scientist I, Genomic Health, Redwood City, CA
Robert Rydze, MD	Master's Program, Clinical Scientist Training Program, June 2017-2019 Current Position: Assistant Professor, Medical College of Wisconsin

### Thesis Advisory Committee Member

#### Former Students

Caterina Clementi	Human Genetics Graduate Program, BCM, Graduated May 2014
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Jia Peng	Current Position: Manager, Celmatix Human Genetics Graduate Program, BCM; Graduated May 2014
Jaye Adams, MD	Current Position: Research Scientist, Bristol-Myers Squibb Clinical Scientist Training Program, BCM. Graduate May 2016 Current Position: Private Practice
Paul Fullerton	Molecular & Human Genetics, BCM, Graduate, May 2017 Current Position: Research Application Scientist, Partek, Inc.
Sara Arian, MD	Clinical Scientist Training Program, BCM 2016-2018 Current Position: Assistant Professor, Baylor College of Medicine
Jessica Ruben, MD	Clinical Scientist Training Program, BCM, 2016-present Current Position: Private Practice
Marisol O'Neill	Molecular & Cellular Biology, BCM, Graduate, December 2018 Current Position: Postdoctoral Fellow, UCSF
Maya Kriseman, MD	Clinical Scientist Training Program, BCM, Graduate, June 2018 Current Position: Assistant Professor, BCM, 2019-present
Alejandra Ontiveros	Developmental Biology Program, BCM, 2018-2020 Current Position: Postdoctoral Fellow, UCSF
Joie Guner, MD	Clinical Scientist Training Program, BCM, 2019-2021 Current Position: Assistant Professor, USC

**Current Graduate Students**

Shannon Moree	Molecular & Cellular Biology Program, BCM, 2019-present
Gabriel Tukeman	Molecular & Cellular Biology Program, BCM 2020-present
Alyssa Alaniz	Cancer & Cell Biology Program, BCM 2020-present
Nathan A. Drolet	Cancer & Cell Biology Program, BCM 2020-present
Erin L. Clayton	Cancer & Cell Biology Program, BCM 2020-present
Sydney Parks	Cancer & Cell Biology Program, BCM 2021-present
Kshiti Dholakia	Cancer & Cell Biology Program, BCM 2021-present

**Other Student Mentoring**

Carl Dernell	Summer Medical and Research Training (SMART) Program, Baylor College of Medicine, Summer 2012 *Current Position: Medical Student at University of Colorado
Hermann Piard	Rice University Senior Thesis Project 2010-2011 *Current Position: Medical Student at Florida Atlantic University
Astrid Diaz	Summer Medical and Research Training (SMART) Program, Baylor College of Medicine, Summer 2013
David Lawrence	Center for Reproductive Biology Summer High School Internship, 2013
Emily Boerger	Summer Medical and Research Training (SMART) Program, Baylor College of Medicine, Summer 2014
Olivia Lanser	Summer Medical and Research Training (SMART) Program, Baylor College of Medicine, Summer 2015
Adam Green	Summer Medical and Research Training (SMART) Program, Baylor College of Medicine, Summer 2017
Hannia Toralba-Salazar	Student Intern (University of Houston), 2014-present
Avery Myers	Rice University Research Project, Jan 2019-2021
Surabhi Madadi	Rice University Research Project, Sept 2020-present

**IV. SERVICE INFORMATION**

**Administrative Responsibilities (BCM, Departmental)**



Member	Selection Committee, Milton J. Finegold Graduate Student Achievement Award Pathology & Immunology, 2009-2016
Chair	Selection Committee, Milton J. Finegold Graduate Student Achievement Award Pathology & Immunology, 2016-present
Member	Standing Examination Committee, Pathology & Immunology, 2011-2012
Member	Standing Examination Committee, Molecular & Cellular Biology, 2011-2013
Member	Student Temporary Advisory Committee, Molecular & Cellular Biology Graduate Program, 2014-2019
Member	Graduate Education Committee, Molecular & Cellular Biology, 2013-current

### **Administrative Responsibilities (BCM, College-Wide)**

Member	Institutional Animal Care and Use Committee (IACUC) 2013-present
Member	Promotions Committee, Graduate School of Biomedical Sciences, 2014-2020
Co-Leader	Gynecologic Cancer Working Group, Dan L. Duncan Cancer Center, 2015-present
Group Leader	Reproductive Cancers, Center for Reproductive Medicine, 2015-2018
Member	Advanced Technology Cores (ATC) Oversight Committee, 2015-present
Member	Search Committee, Director for the ATC Genetically Engineered Mouse Core
Member	Student Services Committee (Formerly Student Affairs), 2015-2018
Member	Graduate School of Biomedical Sciences Strategic Transformation Committee (2017-2019)
Co-Chair	Graduate School of Biomedical Sciences Strategic Transformation Subcommittee on Training Program III - Qualifying Exams & Graduation (2018)
Member	Steering Committee, Graduate Program in Development, Disease Models, & Translation (2018-present)
Member	Steering Committee, Graduate Program in Cancer & Cell Biology (2018-present)
Co-Chair	Curriculum Committee, Graduate Program in Cancer & Cell Biology (2018-present)
Member	Graduate School of Biomedical Sciences Curriculum Sub-Committee (2018-present)
Faculty Leader	Hispanic Women in Science Student Group (2018-present)
Group Leader	Initiative for Maximizing Student Development (IMSD) Peer Mentor Group (2018-present)
Member	Search Committee, Director of the BCM Mouse Metabolism and Phenotyping Core (2018)
Faculty Adv.	Cancer & Cell Biology Graduate Program, 1 <sup>st</sup> year student advising (2019-current)
Co-director	Cancer & Cell Biology Graduate Program (2019-current)

### **Other**

Poster judge	Graduate School of Biomedical Sciences Research Symposium, 2011-2016
Platform judge	35 <sup>th</sup> Annual MCB Student Symposium, Molecular & Cellular Biology Program, 2013-2015 (annually)
Advisor	36 <sup>th</sup> Annual MCB student Symposium, Molecular & Cellular Biology Program, 2014
Poster judge	37 <sup>th</sup> Annual MCB Student Symposium, Molecular & Cellular Biology Program, 2015

### **Community Service**

Facilitator	Houston Area, Survivors Teaching Students: Saving Women's Lives Program, Ovarian Cancer National Alliance, 2013-2015
Organizer	Doctor's Day Outreach, International Day of Women & Girls in Science, Rusk Middle School, Houston TX Feb. 11, 2019