

**BIOGRAPHICAL SKETCH**

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|  |                           |                             |                                  |
|--|---------------------------|-----------------------------|----------------------------------|
| NAME<br>Gail S. Prins, Ph.D.   |                           | POSITION TITLE<br>Professor |                                  |
| eRA COMMONS USER NAME<br>gprins  |                           |                             |                                  |
| EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.) |                           |                             |                                  |
| INSTITUTION AND LOCATION   | DEGREE<br>(if applicable) | YEAR(s)                     | FIELD OF STUDY                   |
| Trinity Christian College, Palos Heights, IL   | B.A.                      | 1974                        | Biology/Chemistry                |
| University of Illinois, Health Sciences Center, Chicago  | Ph.D.                     | 1979                        | Physiology                       |
| Northwestern University, Chicago, IL   | Postdoctoral Fellow       | 1979-1983                   | Reproductive Biology/<br>Urology |

**A. Positions and Honors****Positions and Employment**

1983-1990 Assistant Professor, Department of Obstetrics & Gynecology, The University of Chicago  
 1983-1987 Director, University of Chicago-Michael Reese Hospital *In Vitro* Fertilization Laboratory  
 1987-1995 Director, Reproductive Biology Laboratory, Michael Reese Hospital  
 1991-1995 Research Associate Professor, Department of OB/GYN, University of Illinois  
 1996-2000 Associate Professor, Departments of Urology and Physiology  
 University of Illinois at Chicago, College of Medicine  
 1996-present Director, University Andrology Laboratory, University of Illinois  
 2001-present Professor, Departments of Urology and Physiology & Biophysics,  
 University of Illinois at Chicago

**Professional Activities**

**Officer:** President, American Society of Andrology (2003-2004)  
**Active Member:** Endocrine Society; American Society of Andrology; Society for Basic Urologic Research;  
 Society for Study of Reproduction, Society for Developmental Biology  
**Editorial Board:** Associate Editor, *J Andrology*, 1992-1997  
 Editorial Board, *Endocrinology*, 1998-2002; *Asian Journal of Andrology*, 2004-08,  
*Reproductive Toxicology* (2006-2010); *The Prostate*, 2006-2010, *J Andrology*, 2007-10  
**NIH Study Sections:** Biochemical Endocrinology, 1995; Reproductive Endocrinology, 1996; SEP-  
 Reproductive Endocrinology, 10/01, 03/02, 03/03, 10/03; SEP-Pathology B, 1999;  
 Urology Centers, NIDDK, 1996; 1999; NIH P50 Program Project Site Visits 12/99; 03/01;  
 01/03 (Chair); 11/03 (Chair); U54 Infertility Centers, NICHD, 2002; NCI Program Project  
 Grants 01/05  
**Advisory Panel:** Integration Panel for Prostate Cancer Research Program, Department of Defense,  
 2000-2007 (*Executive Committee*, 2002-06).  
 NIEHS External Scientific Review Committee (2004-2008)  
 NTP/NIEHS Endocrine Disruptors Low-Dose Peer Review Panel, October, 2000  
 NIEHS/EPA Expert Panel on Bisphenol A, November 2006

**Honors**

2001 Distinguished Service Award, American Society of Andrology  
 2006 AUA Lectureship Award, American Society of Andrology  
 2006 AUA Lectureship Award, Society for Basic Urologic Research

**B. Selected peer-reviewed publications (from a list of 125)**

1. Prins, GS: Neonatal estrogen exposure induces lobe-specific alterations in adult rat prostate androgen receptor expression. *Endocrinology* 130:2401-2412, 1992.

2. Prins GS, Woodham C, Lepinske M, Birch L: Effects of neonatal estrogen exposure on prostatic secretory genes and their correlation with androgen receptor expression in the separate prostate lobes of the adult rat. *Endocrinology* 132:2387-2398, 1993.
3. Prins GS: Development of the prostate. In: Reproductive Issues and the Aging Male. Eds: F Haseltine, C Wang, Embryonics, Inc., New York, pg 101-112, 1993.
4. Prins GS, Birch L: The developmental pattern of androgen receptor expression in the rat prostate lobes is altered following neonatal exposure to estrogen. *Endocrinology* 136:1303-1314, 1995.
5. Prins GS and C Woodham: Autologous regulation of androgen receptor mRNA in the separate lobes of the rat prostate gland. *Biol Reprod* 53: 609-619, 1995.
6. Prins GS, Jung M, Chatterjee B, Roy AK: Age-dependent expression of the androgen receptor gene in prostate and implications in cellular differentiation and hyperplasia. *Develop Genetics* 18:99-106, 1996.
7. Prins GS and L Birch: Neonatal estrogen exposure up-regulates estrogen receptor expression in the developing and adult rat prostate lobes. *Endocrinology* 138:1801-1809, 1997.
8. Prins GS: Developmental estrogenization of the prostate gland. In: *Prostate: Basic and Clinical Aspects*. Ed: Rajesh K. Naz, CRC Press Inc., Chpt 10, pg 247-263, 1997.
9. Prins GS, Sklarew RJ, Pertschuk LP: Image analysis of androgen receptor immunostaining in prostate tumors accurately predicts response to hormonal therapy. *J Urology* 159:641, 1998.
10. Prins GS, Marmer M, Woodham C, Chang W, Kuiper G, Gustafsson J-A, Birch L: Estrogen receptor *beta* mRNA ontogeny in the rat prostate and effects of neonatal estrogen exposure on the expression pattern. *Endocrinology* 139:874-883, 1998.
11. Roman BL, Timms BG, Prins GS, Peterson RE: *In utero* and lactational exposure of the male rat to 2,3,7,8-Tetrachlorodibenzo-p-dioxin impairs prostate development: 2. Effects on growth and cytodifferentiation. *Toxicology and Applied Pharmacology* 150(2): 254-270, 1998.
12. Chang W, Wilson M, Birch L, Prins G: Neonatal estrogen stimulates proliferation of periductal fibroblasts and alters extracellular matrix composition in rat prostate. *Endocrinology* 140:405-415, 1999.
13. Chang WY, Birch L, Woodham C, Gold L, Prins GS: Neonatal estrogen exposure alters the TGF $\beta$  signaling system in the developing rat prostate and interrupts TGF $\beta$ -mediated differentiation of the epithelium. *Endocrinology* 140:2801-2813, 1999.
14. Chang W, Prins G: Estrogen receptor $\beta$ : Implications for the prostate gland. *Prostate* 40:115-124, 1999.
15. Jarred RA, Cancilla B, Prins GS, Cunha GR, Risbridger GP: Evidence that estrogens directly alter androgen regulated prostate development. *Endocrinology* 141:3471-3477, 2000.
16. Habermann H, Chang W, Birch L, Mehta P, Prins GS: Developmental exposure to estrogens alters epithelial cell adhesion and gap junction proteins in the adult rat prostate. *Endocrinology* 142:359-369, 2001.
17. Putz O, Kim S, Schwartz, R Cooper, G LeBlanc, GS Prins: Neonatal low- and high-dose exposure to estradiol benzoate in the male rat: I. Effects on the prostate gland. *Biol Reprod* 65:1496-1505, 2001.
18. Putz O, C Schwartz, G LeBlanc, R Cooper, GS Prins: Neonatal low- and high-dose exposure to estradiol benzoate in male rats: II. Effects on male puberty and the reproductive tract. *Biol Reprod* 65: 1506-17, 2001.
19. Prins GS, Birch L, Couse JF, Choi I, Katzenellenbogen B, Korach KS: Estrogen imprinting of the developing prostate gland is mediated through stromal ER $\alpha$ ? Studies with  $\alpha$ ERKO and  $\beta$ ERKO mice. *Cancer Research* 61:6089-6097, 2001.
20. Prins GS, Birch L, Habermann H, Chang WC, Tebeau C, Putz O, Bieberich C: Influence of neonatal estrogens on rat prostate development. *Reprod Fertil Dev* 13:241-252, 2001.
21. Habermann H, Ray V, Habermann W, Prins GS: Alterations in gap junction protein expression in human BPH and prostate cancer. *J Urology* 166: 2267-2273, 2001.
22. Bekir B, Koeneman K, Edland M, Prins GS, Zhau HE, Chung LWK: Androgen receptor mediates reduced tumor growth, enhanced androgen responsiveness and selected target gene transactivation in a human prostate cancer cell line. *Cancer Research* 61:7310-7317, 2001.
23. Prins GS, Chang W, Wang Y, van Breeman R: Retinoic acid receptors and retinoids are up-regulated in developing and adult rat prostate by neonatal estrogen exposure. *Endocrinology* 143:3628-3640, 2002.
24. Putz O and Prins GS: Prostate gland development and estrogenic imprinting. In: *Steroid Hormones and Cell Cycle Regulation*. Ed: K Burnstein, Kluwer Academic Publishers, Norwell, MA pg 73-90, 2002.
25. Gilleran JP, Putz O, DeJong M, DeJong S, Birch L, Pu YB, Huang L, Prins GS: The role of prolactin in the prostatic inflammatory response to neonatal estrogen. *Endocrinology* 144:2046-2054, 2003.
26. Derry JJ, Prins GS, Ray, V, Tyner AL: Altered localization and activity of the intracellular tyrosine kinase BRK/Sik in prostate tumor cells. *Oncogene* 22:1-9, 2003.

27. Woodham C, Birch L, Prins GS: Neonatal estrogen down regulates prostatic androgen receptor through a proteasome mediated degradation pathway. *Endocrinology* 144:4841-4850, 2003.
28. Huang L, Pu Y, Shumyle A, Birch L, Prins GS: Estrogenic regulation of signaling pathways and homeobox genes during prostate development. *J Andrology* 25:330-337, 2004.
29. Pu, Y, Huang, L, Prins GS: Sonic Hedgehog-Patched-Gli signaling in the developing rat prostate gland: Lobe-specific suppression by neonatal estrogens reduces ductal growth and branching. *Developmental Biology* 273:257-275, 2004.
30. Huang L, Pu Y, Shumyle A, Birch L, Prins GS: The role of Fgf10 signaling in branching morphogenesis and gene expression in the rat prostate gland: Lobe-specific suppression by neonatal estrogens. *Developmental Biology* 278: 396-414, 2005.
31. Chen H, Mutton LN, Prins GS, Bieberich CJ: Distinct regulatory elements mediate the dynamic expression pattern of *Nkx3.1*. *Developmental Dynamics* 234: 961-973, 2005.
32. Wang Z, Prins GS, Coschigano KT, Kopchick JJ, Green JE, Ray VH, Hedayat S, Christov KT, Unterman TG and Swanson SM: Disruption of Growth Hormone signaling retards early stages of prostate carcinogenesis in the C3(1)/Tag mouse. *Endocrinology* 146 (12): 5188-5196, 2005.
33. Bianco JJ, Hong W, Prins GS, Risbridger GP: Evaluating the direct and indirect effects of neonatal estrogen imprinting on pathogenesis of the mature murine prostate gland. *Am J Path* 168:1869-78, 2006.
34. Nanda NK, Birch L, Greenberg N, Prins GS: MHC Class I and Class II are expressed in both human and mouse prostate tumor microenvironment. *Prostate* 66:1275-1284, 2006.
35. Prins GS, Diwadkar V, Swanson SM, Birch L, Lantvit DL, Diamond AM: Selenoprotein deficiency accelerates prostate carcinogenesis in a transgenic mouse model. *PNAS* 103:8179-8184, 2006.
36. Ho S-M, Tang W-Y, Belmonte J, Prins GS: Developmental exposure to estradiol or bisphenol A epigenetically regulates phosphodiesterase 4 and increases susceptibility to prostate carcinogenesis. *Cancer Research* 66(11):5624-32, 2006. [Highlighted in *Environmental Health Perspectives* 114 (9), A520].
37. Prins GS, Birch L, Tang WY, Ho SM: Developmental estrogen exposures predispose to prostate carcinogenesis with aging. *Reproductive Toxicology* 23(3): 374-382, 2007.
38. Huang L, Pu Y, Birch L, Prins GS: Posterior Hox gene expression and differential androgen regulation in the developing and adult rat prostate lobes. *Endocrinology*, 148(3), 1235-1245, 2007.
39. Pu Y, Huang L, Birch L, Prins GS: Androgen regulation of prostate morphoregulatory gene expression: *Fgf10* dependent and independent pathways. *Endocrinology* 148 (4), 1697-1706, 2007.
40. Keri R, Ho SM, Hunt PA, Knudsen KE, Soto AM, Prins GS: An Evaluation of Evidence for the Carcinogenic Activity of Bisphenol A: Report of NIEHS Expert Panel on BPA. *Reproduct Toxicology* 24: 240-252, 2007.

### **C. Research Support:** **Ongoing Research Support**

Type: R01 DK40890-17                      Prins (PI)                      Current Period : 8/1/05 – 7/31/10

Agency: NIH/NIDDK

Developmental Estrogenization of Rat Prostate Gland

The long-term objective of this project is to identify the cellular and molecular pathways by which early estrogen exposure imprints rat prostate gland growth, function, and development. The focus of the current funding period is to examine the resultant alterations in expression of key developmental genes and paracrine signaling molecules.

Role: Principal Investigator

Type: R01 ES015584-01                      Prins (PI)                      Current Period : 1/15/08 – 11/31/12

Agency: NIH/NIEHS

Epigenetic Basis for Prostate Carcinogenesis following Early Estrogenic Exposures

The major objectives of this proposal are to characterize the effects of estrogens on prostate gland carcinogenesis with aging in rodent and human models, to identify and characterize methylation regulated genes as a function of estrogenic exposures, and to determine the carcinogenic potential of methylation-regulated genes.

Role: Principal Investigator

Type: R01 CA101053      Diamond (PI)      Current Period: 7/1/04 – 6/31/08

Agency: NIH/NCI

Selenoproteins and Prostate Cancer

The major objective of this proposal is to determine whether selenoproteins are involved in mediating the chemoprotective effects of selenium on prostate cancer using human prostate cell culture and transgenic mouse models.

Role: Co-Investigator

### **Pending Research Support**

Type: R03CA136023-01      Prins (PI)      Period: 6/1/08 – 0/31/10

Agency: NIH/NCI

Dietary Intervention for Bisphenol A-induced Susceptibility to Prostate Neoplasia

The major objectives of this proposal are to assess whether dietary intervention with maternal folate supplementation will reverse the prostatic epigenetic imprints and adult-onset pathology observed following neonatal exposure to estradiol or bisphenol A.

Role: Principal Investigator

### **Research Support completed in Past 3 Years:**

Type: R21 ES12281-02      Prins (PI)      Period: 6/1/03 – 02/28/07

Agency: NIH/NIEHS

Estrogen Imprinting of the Prostate Gland via Gene Methylation

The major objectives of this proposal were to determine whether early estrogenic exposures to estradiol or bisphenol A can sensitize the adult prostate of Sprague-Dawley rats to estrogen-induced carcinogenesis and whether estrogenic imprinting of aging-associated prostate neoplasia is mediated through alterations in developmental methylation of specific genes.

Role: Principal Investigator

Type : Idea Development Award      Swanson (PI)      Period : 10/1/03 - 9/30/06

Agency : DoD/PCRP

Role of Growth Hormone in Prostate Cancer

The long-term objective of this project was to determine whether disruption of GH signaling renders susceptible rodent strains resistant to prostate carcinogenesis.

Role : Co-Investigator