PAMELA K. KREEGER, Ph.D.

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EDUCATION

Ph.D.	Chemical Engineering, Northwestern University, June 2005 Thesis title: Alginate Matrices for the *in vitro* Culture of Ovarian Follicles: Regulation by Extracellular Matrix and Follicle Stimulating Hormone
Summer Program	Frontiers in Reproduction, Marine Biological Laboratory, 2002
B.S.	Chemistry, Valparaiso University, May 2000 Minors: Biology, Mathematics, and History *Summa cum laude*

RESEARCH EXPERIENCE

8/05 – present	Post-Doctoral Fellow, Biological Engineering Division, MIT Principal Investigator: Douglas A. Lauffenburger *Research Areas:* Experimental and computational investigations of K-ras and N-ras signaling networks in apoptosis, utilizing both *in vitro* and *in vivo* systems.
9/00 – 7/05	Graduate Student, Chemical and Biological Engineering Department, Northwestern University Principal Investigator: Lonnie D. Shea *Research Areas*: Development of a three-dimensional system for *in vitro* ovarian follicle culture that allows for the examination of fundamental questions about the roles of cell-cell and cell-matrix interactions in follicle development.
5/99-8/99 and 5/00-8/00	Intern, Beams Division, Fermi National Accelerator Laboratory Supervisor: Maurice Ball *Research Areas*: Examination of the causes of copper corrosion in a low conductivity water cooling system, resulting in the implementation of instrumentation to monitor conditions.
5/98-9/98	Undergraduate Research Assistant, Department of Chemistry, Valparaiso University Principal Investigator: A. Gilbert Cook *Research areas*: Synthesis and characterization of enamines and ketoamides to examine the role of thermodynamic versus kinetic control in chemical reactions.
5/97-9/97	Undergraduate Research Assistant, Department of Chemistry, Valparaiso University Principal Investigator: Michael Bradley *Research areas*: Characterization of the dissolution of enteric coatings using fluorescence spectroscopy.

PUBLICATIONS

1. S.K. Bristol-Gould, P.K. Kreeger, C.G. Selkirk, S.M. Kilen, K.E. Mayo, L.D. Shea, and T.K. Woodruff. "Fate of the Initial Follicle Pool: Empirical and Mathematical Evidence Supporting its Sufficiency for Adult Fertility." *Developmental Biology*. In press.

2. S.K. Bristol-Gould, P.K. Kreeger, C.G. Selkirk, S.M. Kilen, R.W. Cook, J.L. Kipp, L.D. Shea, K.E. Mayo, and T.K. Woodruff. "Postnatal Regulation of Germ Cells by Activin: the Establishment of the Initial Follicle Pool." *Developmental Biology*. In press.

3. M. Xu, P.K. Kreeger, L.D. Shea, and T.K. Woodruff. "Tissue Engineered Follicles Produce Live, Fertile Offspring." *Tissue Engineering*. In press.

4. P.K. Kreeger, J.W. Deck, T.K. Woodruff, and L.D. Shea. "The *In Vitro* Regulation of Ovarian Follicle Development Using Alginate-Extracellular Matrix Gels." *Biomaterials*. 27, p 714-723, 2006.

5. P.K. Kreeger, N.N. Fernandes, T.K. Woodruff, and L.D. Shea. "Regulation of Mouse Follicle Development by Follicle Stimulating Hormone in a Three-Dimensional *In Vitro* Culture System is Dependent on Follicle Stage and Dose." *Biology of Reproduction*. 73, p 942-950, 2005.

6. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Murine Granulosa Cell Morphology and Function are Regulated by a Synthetic Arg-Gly-Asp Matrix." *Molecular and Cellular Endocrinology*. 205, p 1-10, 2003.

7. P.K. Kreeger and L.D. Shea. "Scaffolds for Directing Cellular Responses and Tissue Formation." In Biomimetic Materials and Design: Interactive Biointerfacial Strategies, Tissue Engineering and Drug Delivery. Marcel Dekker, Inc, 2002.

8. A.G. Cook and P.K. Kreeger. "Reaction of Morpholine with t-Butyl Acetoacetate: A Study of Kinetic vs. Thermodynamic Control, Product Identification, and Molecular Modeling." *Journal of Chemical Education*. 77, p 90-2, 2000.

PRESENTATIONS

1. E.R. West, P.K. Kreeger, J.W. Deck, T.K. Woodruff, and L.D. Shea. "Alginate Hydrogel Mechanics Regulate Follicle Growth in a Three-Dimensional *In Vitro* Culture System." *American Institute of Chemical Engineers*. Cincinnati, OH. Nov. 2005.

2. E.R. West, P.K. Kreeger, J.W. Deck, T.K. Woodruff, and L.D. Shea. "Alginate Hydrogel Mechanics Regulate Follicle Growth in a Three-Dimensional *In Vitro* Culture System." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2005.

3. P.K. Kreeger, N.N. Fernandes, J.W. Deck, T.K. Woodruff, and L.D. Shea. "Extracellular Matrix Regulation of Follicle Development in an *In Vitro* Culture System." *European Society for Human Reproduction Campus: Mammalian Oogenesis and Folliculogenesis*. Paris, France. Mar. 2005 (selected for podium presentation)

4. P.K. Kreeger, N.N. Fernandes, T.K. Woodruff, and L.D. Shea. "Alginate-Extracellular Matrix Gels to Promote Maturation of Ovarian Follicles." *American Institute of Chemical Engineers*. Austin, TX. Nov. 2004.

5. K.E. Mayo, S.K. Bristol-Gould, J.L. Kipp, J. Weck, S.M. Kilen, A. Burkart, C. Matulis, P.K. Kreeger, and T.K. Woodruff. "Regulation and Actions of Inhibin and Activin in the Ovary." *Serono Ovarian Workshop*. Vancouver, Canada. July 2004.

6. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Alginate Matrices for the *In Vitro* Culture of Immature Murine Ovarian Follicles." *Midwest Microscopy and Microanalysis Society*, Evanston, IL. Mar. 2004. (invited)

7. T.K. Woodruff, P.K. Kreeger, C.B. Berkholtz, J. Roh, S. Kalra, J. Zhang, R. Kazer, and L.D. Shea. "TGFβ Family Members that Impact on Follicle Development and Oocyte Growth." *Updates in Infertility Treatment*, Marco Island, FL. Jan. 2004.

8. P.K. Kreeger, C.B. Berkholtz, T.K. Woodruff, and L.D. Shea. "Alginate Matrices for the Culture of Immature Murine Ovarian Follicles." *American Institute of Chemical Engineers*, San Francisco, CA. Nov. 2003.

9. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Collagen Type I Improves Survival and Stimulates Granulosa-Oocyte Complex Growth *In Vitro*." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2003. Constance Campbell Award.

10. P.K. Kreeger, C.B. Berkholtz, T.K. Woodruff, and L.D. Shea. "*In Vitro* Maturation of Granulosa-Oocyte Complexes in Synthetic Scaffolds." *Society for Biomaterials*. Reno, NV. Apr. 2003.

11. P.K. Kreeger and L.D. Shea. "Tissue Engineering: General Principles and Application in Ovarian Biology." *Valparaiso University*. Valparaiso, IN. Mar. 2003. (invited)

12. P.K. Kreeger, C.B. Berkholtz, T.K. Woodruff, and L.D. Shea. "A Novel System for *In Vitro* Culture of Immature Granulosa-Oocyte Complexes." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2002. Constance Campbell Award.

13. S.A. Pangas, H. Saudye, P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Hydrogel Scaffolds for the Culture of Primary Ovarian Follicles." *American Institute of Chemical Engineers*. Reno, NV. Nov. 2001.

POSTER SESSIONS

1. P.K. Kreeger, S.K. Bristol-Gould, C.G. Selkirk, S.M. Kilen, K.E. Mayo, L.D. Shea, and T.K. Woodruff. "The Fate of the Initial Follicle Pool: Empirical and Mathematical Evidence Supporting its Sufficiency for Fertility." *Endocrine Society*. Boston, MA. June 2006.

2. S.K. Bristol-Gould, P.K. Kreeger, C.G. Selkirk, S.M. Kilen, R.W. Cook, J.L. Kipp, L.D. Shea, K.E. Mayo, and T.K. Woodruff. "Postnatal Regulation of Germ Cells by Activin: Establishment of and Optimal and Necessary Quantity of Follicles Prior to Puberty." *Endocrine Society*. Boston, MA. June 2006.

3. M. Xu, P.K. Kreeger, L.D. Shea, and T.K. Woodruff. "Tissue Engineered Follicles Produce Live, Fertile Offspring." *Endocrine Society*. Boston, MA. June 2006.

4. S.K. Bristol-Gould, P.K. Kreeger, C.G. Hutten, S.M. Kilen, R.W. Cook, J.L. Kipp, L.D. Shea, K.E. Mayo, T.K. Woodruff, "Postnatal Regulation of Germ Cells by Activin." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2005.

5. P.K. Kreeger, J.W. Deck, N.N. Fernandes, T.K. Woodruff, and L.D. Shea. "Reconstructed Basement Membrane Regulation of Murine Follicle Maturation in a Three-Dimensional Culture System." *Society for the Study of Reproduction*. Vancouver, Canada. Aug. 2004. USDA Merit Award.

6. P.K. Kreeger, N.N. Fernandes, C.B. Berkholtz, T.K. Woodruff, and L.D. Shea. "Gonadotropin Supplementation Enhances Development for Murine Preantral Follicles Cultured in a Three-Dimensional System." *Society for the Study of Reproduction*. Vancouver, Canada. Aug. 2004.

7. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Reconstructed Basement Membrane and Gonadotropin Regulation of Murine Follicle Maturation in a Three-Dimensional Culture System." *Serono Ovarian Workshop*. Vancouver, Canada. July 2004. Cornelia Channing Award.

8. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Alginate Scaffolds for the Culture of Ovarian Follicles in a Stage Specific Manner." *American Institute of Chemical Engineers*. Austin, TX. Nov. 2004.

9. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Three-Dimensional Culture of Murine Follicles *In Vitro*: Extracellular Matrix Effects." *Gordon Research Conference: Reproductive Tract Physiology*, New London, CT. June 2004. Gramm Award.

10. P.K. Kreeger, C.B. Berkholtz, T.K. Woodruff, and L.D. Shea. "A Novel Three-Dimensional System for the *In Vitro* Culture of Immature Murine Ovarian Follicles." *Society for the Study of Reproduction*. Cincinnati, OH. July 2003.

11. C.B. Berkholtz, P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Follicle Size Increases in a Synthetic Stroma." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2002.

12. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Alginate Matrices to Regulate Granulosa Cell Morphology and Steroid Production." *Biomedical Engineering Society*. Houston, TX. Oct. 2002. Student Travel Award.

13. P.K. Kreeger, T.K. Woodruff, and L.D. Shea. "Synthetic Scaffolds to Regulate Granulosa Cell Adhesion and Spreading." *Northwestern University Reproductive Mini-Symposium*. Evanston, IL. Oct. 2001. Constance Campbell Award.

TECHNICAL SKILLS

Cell and organ culture (primary cell/tissue isolation, proliferation/viability assays)
Microscopy (transmission, fluorescence, and confocal)
Biomaterials development and characterization
Histology (embedding, sectioning, staining)
ELISA, Western blotting, iodination
Luminex assays
Software: Adobe InDesign & Photoshop, JMP Statistics Software, Kaleidagraph, Microsoft Office

FELLOWSHIPS AND AWARDS

Anna Fuller Fund Fellowship in Molecular Oncology	2006
Northwestern University Fellow	2004-2005
Alpha Lambda Delta Graduate Fellowship	2004-2005
USDA Merit Travel Fellowship Award	2004
Gramm Travel Fellowship Award	2004

Metz Scholarship in Reproductive Biology	2002
Student Travel Award, Biomedical Engineering Society	2002
National Defense Science and Engineering Graduate Fellowship	2001-2004
National Science Foundation Fellowship (declined)	2001
Teaching Assistant of the Year, Department of Chemical Engineering	2001
Cabell Fellowship, Northwestern University	2000-2001

TEACHING EXPERIENCE

9/03-12/03	Teaching Apprenticeship Program, Undergraduate Equilibrium Separations, Northwestern University
4/02-6/02	Teaching Assistant, Undergraduate Kinetics and Reactor Design, Northwestern University
1/01-3/01	Teaching Assistant, Undergraduate Heat Transfer, Northwestern University
9/97-5/00	Teaching Assistant, Undergraduate General Chemistry, Valparaiso University

STUDENTS MENTORED

Rebecca Kusko	Undergraduate in Biological Engineering, summer 2006
Jason Deck	Undergraduate in Biomedical Engineering, 2003-2005
Melissa Chamberlin	Integrated Biological Sciences Program Rotation Student, 2003
Courtney Berkholtz	Integrated Biological Sciences Program Rotation Student, 2002
Stephen Sung	Undergraduate in Chemical Engineering, 2002 - 2003
Amy Lewis	Undergraduate in Chemical Engineering, 2001 - 2002

ACTIVITIES

Cell Decision Processes Center	2005-present
Faculty Search Committee, Chemical and Biological Engineering	2002, 2004
Graduate Recruitment Committee, Chemical and Biological Engineering	2003
Co-President of Chemical Engineering Graduate Student Fellowship	2001

PROFESSIONAL SOCIETIES

Endocrine Society
American Institute of Chemical Engineers (AIChE)
Society for the Study of Reproduction (SSR)
European Society of Human Reproduction and Embryology (ESHRE)