

UNIVERSITY OF MIAMI SCHOOL OF MEDICINE
Curriculum Vitae

Date: November 18, 2014

I. PERSONAL

Name: Catherine F. Welsh, M.D.

Office Phone: 305-243-6604

Fax: 305-243-4905

Academic Rank: Associate Professor

Track: Clinical Educator

Primary Department: Medicine

Secondary Apptmnt: None

Citizenship: USA

II. HIGHER EDUCATION

Institutional: 5/80 College of William and Mary B.S.
5/84 Medical College of Virginia M.D.

Non-Institutional: None

Board Certification: 1987 American Board of Internal Medicine
1997 American Board of Internal Medicine, Medical Oncology

Licensure: 1995 Florida #ME 0068086

III. EXPERIENCE

Academic:

- 7/84-6/87 Internship/Residency in Medicine, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio.
- 7/87-7/89 Research Fellow, Department of Physiology and Biophysics University Hospitals of Cleveland, Case Western Reserve University. Cleveland, Ohio.
- 7/89-1/93 Senior Staff Fellow, Laboratory of Cellular Metabolism, National Heart, Lung, and Blood Institute, National Institutes of Health.
- 7/93-6/94 Postdoctoral Research Associate, Department of Cell Biology and Anatomy, University of Miami Medical School.
- 7/94-6/97 Clinical Fellow, Division of Hematology/Oncology, Dept. of Medicine, University of Miami Medical School.
- 7/97-5/03 Assistant Professor of Clinical Medicine, Department of Medicine, University of Miami School of Medicine.
- 6/03-present Associate Professor of Clinical Medicine, Department of Medicine, University of Miami School of Medicine.

Hospital Appointments:

- Jackson Memorial Hospital, Attending Physician 1997-present
University of Miami Hospital and Clinic, Attending Physician 1997-present

Non-Academic: none

Military: none

IV. PUBLICATIONS

BOOKS AND MONOGRAPHS:

Welsh, C. F. Regulation of G1 to S phase transition by adhesion and growth factor signaling. In *Steroid Hormones and Cell Cycle Regulation*. (K. Burnstein, ed.) Kluwer Academic Publishers. pp. 19-32. 2002.

Welsh, C.F., Moss, J., and Vaughan, M. ADP-ribosylation factors: a family of guanine nucleotide-binding proteins that activate cholera toxin and regulate vesicular transport. In *Handbook of Natural Toxins. Bacterial Toxins and Virulence Factors in Disease*. (J. Moss, B. Iglewski, M. Vaughan, and A.T. Tu, eds.). Marcel Dekker, Inc. New York. 8: 257-280. 1995.

Moss, J., Haun, R.S., Tsai, S-C., **Welsh, C.F.**, Lee, F-J.S., Price, S.R., and Vaughan, M. Activation of cholera toxin by ADP-ribosylation factors: 20 kDa guanine nucleotide-binding proteins. In *Methods in Enzymology*, (R. Iyengar, ed.). Academic Press. 237: 44-63. 1994.

Tsai, S.-C., Price, S.R., Tsuchiya, M., **Welsh C.F.**, Adamik, R., Moss, J., and Vaughan, M. Biochemical and developmental characterization of ADP-ribosylation factors a family of 20 kDa guanine nucleotide-binding proteins. In *ADP-Ribosylation Reactions*. (G.G. Poirer and P. Moreau, eds.). Springer-Verlag, pp. 381-384. 1992.

JOURNAL ARTICLES:

Montero AJ, Diaz-Montero CM, Deutsch YE, Hurley J, Koniaris LG, Rumboldt T, Yasir S, Jorda M, Garret-Mayer E, Avisar E, Slingerland J, Silva O, **Welsh C**, Schuhwerk K, Seo P, Gluck S. Phase 2 study of neoadjuvant treatment with NOV-002 in combination with doxorubicin and cyclophosphamide followed by docetaxel in patients with HER-2 negative clinical stage II-IIIc breast cancer. *Breast Cancer Res Treat*. 132: 215-23. 2012

Lobo C, Lopes G, Baez O, Castellon A, Ferrell A, Higgins C, Hurley E, Hurley J, Reis I, Richman S, Seo P, Silva O, Slingerland J, Tukia K, **Welsh C**, Glück S. Final results of a phase II study of nab-paclitaxel, bevacizumab, and gemcitabine as first-line therapy for patients with HER2-negative metastatic breast cancer. *Breast Cancer Res Treat*. 2010 Sep;123(2):427-35. Epub 2010 Jun 29

Silva O, Lopes G, Morgenstern D, Lobo C, Doliny P, Santos E, Abdullah S, Gautam U, Reis I, **Welsh C**, Slingerland J, Hurley J, Gluck S. A Phase II trial of split, low-dose docetaxel and low-dose capecitabine: a tolerable and efficacious regimen in the first-line treatment of patients with HER2/neu-negative metastatic breast cancer. *Clin Breast Cancer*. 8:162-7. 2008.

Vincek, V., Nassiri, M., Block, N., **Welsh, C.F.**, Nadji, M., and Morales, A. R. Methodology for preservation of high molecular-weight RNA in paraffin-embedded tissue: application for laser-capture microdissection. *Diagn. Mol. Pathol*. 14: 127-133. 2005.

Hurley, J., Reis, I., Silva, O., Gomez, C., DeZarraga, F., Velez, P., **Welsh, C.**, and

Powell, J., and Doliny, P. Weekly docetaxel/carboplatin as primary systemic therapy for Her2-negative locally advanced breast cancer. *Clinical Breast Cancer*. 5: 447-454. 2005.

Welsh, C.F. Rho GTPases as key transducers of proliferative signals in G1 cell cycle regulation. *Breast Cancer Res. and Treatment*. 84: 33-42. 2004.

Knight-Krajewski, S., **Welsh, C.F.**, Liu, Y-Q, and Burnstein, K. L. Dereglulation of the Rho GTPase, Rac1, suppresses the cyclin-dependent kinase inhibitor p21^{Cip1} in androgen-independent human prostate cancer cells. *Oncogene* 23:5513-5522. 2004.

Welsh, C.F., Roovers, K., Villanueva, J., Liu, Y., Schwartz, M.A., and Assoian, R.K. Timing of cyclin D1 expression within G1 phase is controlled by Rho. *Nature Cell Biol*. 3: 950-957. 2001

Welsh, C.F. and Assoian, R.K. A growing role for Rho family GTPases as intermediaries in growth factor- and adhesion-dependent cell cycle progression. *Biochim. Biophys. Acta* 1471: M21-M29. 2000.

Bourguignon, L.Y.W., Iida, N., **Welsh, C.F.**, Zhu, D., Krongrad, A., and Pasquale, D. Involvement of CD44 and its variant isoforms in membrane-cytoskeleton interaction, cell adhesion and tumor metastasis. *J. Neuro-Oncology*. 26: 201-208. 1995.

Welsh, C.F., Zhu, D., and Bourguignon, L.Y.W. Interaction of CD44 variant isoforms with hyaluronic acid and the cytoskeleton in human prostate cancer cells. *J. Cell. Physiol*. 164: 605-612. 1995.

Welsh, C.F., Moss, J., and Vaughan, M. Isolation of recombinant ADP-ribosylation factor 6, a 20 kDa guanine nucleotide-binding protein, in an activated GTP-bound state. *J. Biol Chem*. 269: 15583-15587. 1994.

Welsh, C.F., Moss, J., and Vaughan, M. ADP-ribosylation factors: a family of ~20 kDa guanine nucleotide-binding proteins that activate cholera toxin. *Mol. Cell. Biochem*. 138: 157-166. 1994.

Kunz, B.C., Mucynski, K.A., **Welsh, C.F.**, Stanley, S.J., Tsai, S-C., Adamik, R., Chang, P.P., Moss, J., and Vaughan, M. Characterization of recombinant and endogenous ADP-ribosylation factors synthesized in Sf9 insect cells. *Biochemistry*. 32: 6643-6648. 1993.

Price, S.R., **Welsh, C.F.**, Haun, R.S., Stanley, S.J., Moss, J. and Vaughan, M. Effect of phospholipid and GTP on recombinant ADP-ribosylation factors (ARFs): molecular basis for difference in requirements for activity of mamalian ARFs. *J. Biol. Chem*. 267: 17766-17772. 1992.

Welsh, C.F., Moss, J., and Vaughan, M. ADP-ribosylation factor, a guanine nucleotide-binding protein activator of cholera toxin, is isolated in an activated state when expressed as a fusion protein in *Escherichia coli*. *Transactions of the Association of American Physicians*. vol 105. 1992.

Welsh, C., Dubyak, G., Douglas, J.G. Relationship between phospholipase C activation and prostaglandin E2 and cyclic adenosine monophosphate production in rabbit tubular epithelial cells: Effects of angiotensin, bradykinin, and arginine vasopressin. *J. Clin. Invest.* 81: 710-719. 1988.

REFEREED ABSTRACTS

Lyons, L.S., Knight-Krajewski, S., Welsh, C.F., and Burnstein, K.L. Role of the Rho family member Rac1 in androgen-independent prostate cancer cell growth. *Proceedings of the AACR 94:* 5. 2003.

Bourguignon, L.Y.W., Iida, N., Welsh, C.F., Zhu, D., Krongrad, A., and Pasquale, D. Involvement of CD44 and its variant isoforms in membrane-cytoskeleton interaction, cell adhesion, and tumor metastasis. *Mol. Biol. Cell. Suppl.* 6: 49a. 1995.

Welsh, C.F. and Bouguignon, L.Y. Selective expression of the cellular adhesion molecule CD44 in human prostate carcinoma cell lines. *J. Cell. Biochem. Suppl* 18D: 245. 1994.

Welsh, C.F., Moss, J., and Vaughan, M. ADP-ribosylation factor, a guanine nucleotide-binding protein activator of cholera toxin, is isolated in an activated state when expressed as a fusion protein in *Escherichia coli*. *Clinical Research* 40: 215a. 1992.

Welsh, C., Dubyak, G., and Douglas, J.G. Alternative mechanisms of signal transduction for prostaglandin E2 in proximal tubular epithelial cell cultures. *Clinical Research* 36: 598a. 1988.

Welsh, C., Dubyak, G., and Douglas, J.G. Cyclic AMP regulates the level of cytosolic calcium in renal tubular epithelial cells. *Clinical Research* 36: 599a. 1988.

Welsh, C., Dubyak, G., and Douglas, J.G. The natriuretic response to angiotensin and bradykinin are mediated by different mechanisms in proximal and distal tubular epithelial cells. *Clinical Research* 35: 638a. 1987.

V. PROFESSIONAL

Funded Research Performed:

American Society of Clinical Oncology Young Investigator Award
“Mechanisms of CD44-induced Invasion and Metastasis in Breast Cancer”
PI: Catherine Welsh (50%) 7/1/96-6/30/97
Total direct costs: \$32,500

American Society of Clinical Oncology Clinical Research Career Development Award
“The Role of Tiam1 in the Progression of Human Breast Cancer”
PI: Catherine Welsh (20%) 7/1/97-6/30/01
Total direct costs: \$150,000 Indirect Costs: \$7,500

Department of Defense DAMD17-97-1-7013

“Cyclin D1, Anchorage-independent Growth, and Breast Cancer”

PI: Welsh (20%)

9/15/98-9/14/01

Total direct costs: \$167,900

Indirect costs: \$36,886

Department of Medicine, University of Miami Physician-Scientist Development Award

“Rho Family Proteins and Their Role in Regulating Cell Cycle Progression in Breast Cancer: Implications for Tumorigenesis”

PI: Catherine Welsh

7/1/99-6/30/02

Total direct costs: \$376,581

American Cancer Society-Florida Division

Normalization of G1 Cell Cycle Protein Expression in Breast Cancer via Rho Signaling

PI: Catherine Welsh (10%)

6/1/01-6/1/03

Total direct costs: \$49,874

Department of Defense

Rho Family GTPases-Key Regulators of Prostate Cancer Cell Cycle Progression

PI: Kerry Burnstein

(Role on Project: Co-Investigator, 15%)

2/1/02-1/31/05

Total direct costs: \$375,000

Indirect costs: \$170,000

NIH/NCI K08CA87668-01A1

Rho GTPases and Cell Cycle Regulation in Breast Cancer

PI: Catherine Welsh (65%)

9/1/01-8/31/06

Total direct costs: \$608,207

Indirect costs: \$48,656

Florida Breast Cancer Coalition Research Foundation

Expression Profiling of Responsiveness to Neoadjuvant Chemotherapy

PI: Catherine Welsh (10%)

3/1/05-2/28/06

Total direct costs: \$75,000

Indirect costs: \$15,000

Amgen 20050136 (SCCC 2006033)

A Randomized Double-blind Multicenter Study of Denosumab Compared with Zoledronic Acid in the Treatment of Bone Metastases in Subjects with Advanced Breast Cancer

PI: Catherine Welsh

8/9/2006

Total budget:

\$120,000

Editorial Responsibilities:

Ad Hoc reviewer of manuscripts for
Journal of Cell Science

Breast Cancer Research
Journal of Mammary Gland Biology and Neoplasia

Advisory Committee:

Antisoma Research AS1402 anti-MUC1 Breast Cancer Advisory Committee 2007

Professional and Honorary Organizations:

Phi Beta Kappa, Alpha Chapter	1979-present
American Association for the Advancement of Science, Member	1990-present
American Society of Clinical Oncology, Member	1997-present

Honors and awards

1977 - 1979	Presidential Scholarship Recipient
1979	Phi Beta Kappa
1982	Merck Scholarship
1987	Case Western Reserve University Resident Research Award
1988	NIH Training Grant Recipient
1996	American Society of Clinical Oncology Young Investigator Award
1997	American Society of Clinical Oncology Career Development Award
1999	Department of Medicine Physician Scientist Career Development Award
2001	National Cancer Institute/NIH Clinician Scientist Career Development Award
2005	Florida Breast Cancer Coalition Research Foundation Award

Post-Doctoral Fellowships: Noted previously in Academic Experience and repeated below:

1987-89	Research Fellow, Division of Endocrinology and Department of Physiology and Biophysics, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, Ohio.
1989-93	Senior Staff Fellow, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD. Laboratory of Cellular Metabolism, Martha Vaughan, M.D., Chief.
1993-94	Postdoctoral Research Associate, Dept. of Cell Biology and Anatomy, University of Miami Medical School. Lilly Bourguignon, Ph.D., head of laboratory.
1994-97	Clinical Fellow, Division of Hematology/Oncology, Dept. of Medicine, University of Miami Medical School.

Other Professional Activities:

INTERVIEW:

Interviewed by Diana Gonzalez, Health Reporter for NBC6/WTVJ on "Melatonin and Breast Cancer". Broadcast date 2/14/06

PAPERS PRESENTED:

Lyons, L.S., Knight-Krajewski, S., Welsh, C.F., and Burnstein, K.L. Role of the Rho family member Rac1 in androgen-independent prostate cancer cell growth. AACR National Meeting. Washington, D.C. 2003.

Welsh, C.F. Regulation of G1 Cell Cycle Progression by Mitogenic Signaling Pathways in Breast Epithelial and Cancer Cells. Invited speaker. Joint Cancer Conference of the Florida Universities. Orlando, FL, 2002.

Welsh, C.F., Roovers, K., Villanueva, J., Liu, Y-Q., Schwartz, M.A., and Assoian, R.K. The Timing of cyclin D1 Expression Within G1 Phase is Controlled by Rho. Invited speaker. NHLBI/NIH Symposium on Insights Into Signal Transduction. Bethesda, MD, 2001.

Knight-Krajewski, S., Lyons, L.S., Welsh, C.F., and Burnstein, K. Rho GTPases repress cyclin-dependent kinase inhibitors in aggressive prostate cancer cells. AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics. Miami, FL, 2001.

Welsh, C.F., Zhao, S., Assoian, R.K., and Mies, C., Cyclin D1 and p27 in Human Lobular Carcinoma. Era of Hope Department of Defense Breast Cancer Research Program Meeting. Atlanta, GA, 2000.

Welsh, C.F., Villanueva, J., Roovers, K., Schwartz, M.A., and Assoian, R.K. Inactivation of Rho Deregulates the Timing of Cyclin D1 Expression in G1 phase. FASEB Summer Research Conference on Ras Superfamily of Small GTP-Binding Proteins. Snowmass, CO, 2000.

Welsh, C.F., Villanueva, J., Roovers, K., Schwartz, M.A., and Assoian, R.K. Rac and Cdc42 are Required for Adhesion-Dependent Expression of Cyclin D1. Keystone Symposia on Joint Regulation of Signaling Pathways by Integrins and Growth Factors. Breckenridge, CO 2000.

Bourguignon, L.Y.W., Iida, N., Welsh, C.F., Zhu, D., Krongrad, A., and Pasquale, D. Involvement of CD44 and its variant isoforms in membrane-cytoskeleton interaction, cell adhesion, and tumor metastasis. The American Society of Cell Biology 35th Annual Meeting. San Diego, CA, 1995.

Welsh, C.F. and Bourguignon, L.Y. Selective expression of the cellular adhesion molecule CD44 in human prostate carcinoma cell lines. 23rd Annual Keystone Symposia. Keystone, CO, 1994.

Welsh, C.F., Moss, J., and Vaughan, M. ADP-ribosylation factor, a 20 kD guanine nucleotide binding protein activator of cholera toxin, is isolated in an activated state when expressed as a fusion protein in *E. coli*. Annual Meeting of the American Association of Physicians. Washington, D.C., 1992.

Welsh, C.F., Price, S.R., Tsuchiya, M., Stanley, S.J., Nightingale, M.S., Lee, C.-M., and Moss, J. Molecular cloning, expression, and functional characterization of three classes of

mammalian ADP-ribosylation factors. Annual Meeting of the American Society for Biochemistry and Molecular Biology. Washington, D.C., 1991.

Welsh, C.F., Dubyak, G., and Douglas, J.G. cAMP regulates the level of cytosolic calcium in renal tubular epithelial cells. Annual Meeting of the American Society of Clinical Investigation. Washington, D.C., 1988.

Welsh, C.F., Dubyak, G., and Douglas, J.G. Alternative mechanisms of signal transduction for prostaglandin E2 in proximal tubular epithelial cells. Annual Meeting of the American Society of Clinical Investigation. Washington, D.C., 1988.

Welsh, C., Dubyak, G., and Douglas, J.G. The natriuretic response to angiotensin and bradykinin are mediated by different mechanisms in proximal and distal tubular epithelial cells. Annual Meeting of the American Society of Clinical Investigation. Washington, D.C., 1987.

V. TEACHING

Teaching Specialization:

Annual Lecture Series for Fellows

Lectures given:

Adjuvant Hormonal Therapy in Pre- and Postmenopausal Women
Ductal Carcinoma in Situ

Basic Science Course for Medical and Surgical Oncology Fellows

I initiated and organized the course in 2000-20001. It is held on alternating years and I select the topics and speakers, and participate in the didactic lectures.

Topics within this course that I have personally taught include:

Overview of Tumor Biology
Signaling by Growth Factors and Adhesion

Attending Physician, Division of Hematology/Oncology, Department of Medicine, 1997-present.

Responsibilities include teaching Clinical Fellows and Medical residents in four areas:

1. The Breast Cancer Clinic in the Ambulatory Care Center of Jackson Memorial Hospital
2. The Oncology consult service for inpatients at Jackson Memorial Hospital and UMH
3. Coverage on the inpatient Oncology Ward (West Wing 12) at Jackson Memorial Hospital.
4. Coverage of the inpatient unit of UMHC/SCCC

Mechanisms of Disease Course, Breast Cancer Section

Department of Pharmacology, 1998.

Participation: I lectured on the topic of medical therapy of breast cancer in the adjuvant and neoadjuvant settings to the Pharmacology graduate students.

Department of Cell Biology and Anatomy Departmental Seminar, 1997

Title: Clinical Aspects of Breast Cancer Management

Participation: I gave a seminar on the topic of clinical considerations in breast cancer diagnosis and treatment to the members of the Department of Cell Biology, including faculty, students, and post-doctoral fellows.

Thesis and Dissertation Advising:

Graduate Student Thesis Committee Member for Lea Lyons, Department of Pharmacology
Thesis title: Activators of Rho GTPases in Prostate Cancer Progression

Graduate Student Thesis Committee Member for Jessie Villanueva, Department of Cell
Biology and Anatomy.
Thesis title: Regulation of Cyclin D1 Expression and G1 Phase Cell Cycle Progression by
ERK and PI3K Signaling Pathways

VII. SERVICE

University Committees and Administrative Responsibilities:

Data Safety Monitoring Committee
4/06- 4/11

President Shalala's Task Force on Medical Research
Subcommittee on Enhancing Clinical-Basic Science Interactions
9/01-9/02

The American Cancer Society Institutional Research Grant Selection
Committee
10/01 – 10/03

Sylvester Cancer Center Developmental Research Grant Selection Committee
7/02-7/04

Head, Research Education Committee for Oncology Fellowship Program
Division of Hematology/Oncology, Department of Medicine
8/00-6/04

Sylvester Cancer Center Membership Committee 9/99-9/01