
BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME		POSITION TITLE		
Howe, Alan K.		Assistant Professor		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>				
INSTITUTION AND LOCATION		DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of New Hampshire, Durham, NH		B.S.	09/1996	Tumor Cell Biology
Northwestern University, Evanston IL		Ph.D.	06/1990	Biochemistry

A. Positions and Honors

Current Address Vermont Cancer Center
Department of Pharmacology
HSRF Room 322
149 Beaumont Ave.
University of Vermont
Burlington, VT 05405
802-656-9521 (ph)
802-656-2140 (fax)

Positions and Employment

09/01/96 - 07/31/01 Postdoctoral Research Assistant, University of North Carolina
08/01/01 - 07/31/03 Research Assistant Professor, University of North Carolina
08/01/03 – Present Assistant Professor, University of Vermont

Honors

1996 Fellow, Lineberger Comprehensive Cancer Center Postdoctoral Training Award
1999-2001 Postdoctoral Fellow, American Cancer Society
2001 Recipient, Howard Temin Career Award (NCI)

Patents

Phosphoprotein detection reagent and methods of making and using the same
U.S. Patent Application No. 20040146950

Professional Memberships

1996-Present American Society for Cell Biology
1998-Present American Academy for the Advancement of Science
2005-Present Society for Neuroscience, Vermont Chapter
Membership pending American Society for Biochemistry and Molecular Biology

Academic Service

- *Ad hoc* reviewer: Biochim. Biophys. Acta, Cancer Res., Cell Death Differ., Cell Motil. Cytoskel., J. Biol. Chem., J. Cell Biol., J. Cell Sci., J. Invest. Derm., J. Leuko. Biol. Mol. Biol. Cell, Oncogene, Science
- *Ad hoc* reviewer, Research at Undergraduate Institutions Grant Program, National Science Foundation
- *Ad hoc* reviewer, Research Council of Norway "Centres for Research-based Innovation"
- Member, Molecular Signaling 1 Peer Review Study Group, American Heart Association

Invited Talks

2006 Medical College of Georgia, Augusta, GA
2006 Queen's University, Kingston, Ontario, Canada

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- 2005 Society for Neuroscience, Vermont Chapter, Burlington, VT
2005 Molecular & Cellular Biology Program, University of Massachusetts, Amherst, MA
2005 Depts. of Molecular Biophysics & Biochemistry and of Neurobiology, Yale University, New Haven CT
2005 Invited Speaker, Grand Rounds, Ob-Gyn Dept. UVM/FAHC
2004 Co-chair, Vermont Cancer Center Symposium
2004 Invited Speaker, Dept. of Biology, UVM
2003 Invited Speaker, Lake Champlain Cancer Research Organization / Vermont Cancer Center Annual Review Meeting
2003 Invited Speaker, Cell Signaling & Environmental Pathology Seminar Series, UVM / Vermont Cancer Center
2003 Invited Speaker, Dept. of Molecular Physiology & Biophysics, UVM
2003 Invited Speaker, Albany Medical College, Albany NY

B. Selected peer-reviewed publications (from 21 total).

1. **Howe, A.** and Juliano, R.L.. 1998. Distinct mechanisms mediate the initial and sustained phases of integrin-mediated activation of the Raf/MEK/mitogen-activated protein kinase cascade. *J. Biol. Chem.* **273**:27268-27274.
2. **Howe, A.**, Aplin, A.E., Alahari, S. and Juliano, R.L.. 1998. Integrin signaling and cell growth control. *Curr. Opin. Cell Biol.* **10**:220-231.
3. Aplin, A.E., **Howe, A.**, Alahari, S. and Juliano, R.L.. 1998. Signal transduction from cell adhesion receptors - the role of integrins, cadherins, selectins, and Ig-CAMs. *Pharm. Rev.* **50**:197-263.
4. Aplin, A., **Howe, A.K.**, and Juliano, R.L.. 1999. Cell adhesion molecules, signal transduction, and cell cycling. *Curr. Opin. Cell Biol.* **11**:737-744.
5. **Howe, A.K.** and Juliano, R.L.. 2000. Regulation of anchorage-dependent signal transduction by protein kinase A and p21-activated kinase. *Nature Cell Biol.* **2**:593-600.
6. Edin, M., **Howe, A.K.**, and Juliano, R.L.. 2001. Inhibition of PKA negatively regulates fibroblast motility. *Exp. Cell Res.* **270**:214-222.
7. **Howe, A.K.**. 2001. Cell adhesion regulates the interaction between Nck and p21-activated kinase. *J. Biol. Chem.* **276**:14541-14544.
8. **Howe, A.K.**, Aplin, A.E., and Juliano, R.L.. 2002. Anchorage-dependent ERK signaling - mechanisms and consequences. *Curr. Opin. Genet. Dev.* **12**:30-35.
9. **Howe, A. K.**, Hogan, B.P., and Juliano, R.L.. 2002. Regulation of vasodilator-stimulated phosphoprotein phosphorylation and interaction with Abl by protein kinase A and cell adhesion. *J. Biol. Chem.* **277**: 38121-38126
10. Goldfinger, L.E., Han, J., Kiosses, W.B., **Howe, A.K.**, and Ginsberg, M.H.. 2003. Spatial restriction of α 4-integrin phosphorylation regulates lamellipodial stability and α 4 β 1-dependent cell migration. *J. Cell Biol.* **162**:731-741.
11. **Howe, A.K.** 2004. Regulation of actin-based cell migration by cAMP and PKA (Review). *Biochim. Biophys. Acta* **1692**:159-174.
12. Langevin, H.M., Bouffard, N.A., Badger, G.J., Iatridis, J.C., and **Howe, A.K.** 2005. Dynamic fibroblast cytoskeletal response to subcutaneous tissue stretch *ex vivo* and *in vivo*. *Am. J. Physiol. Cell Physiol.* **288**:C747-756.
13. Stanley, A.C., Lounsbury, K.M., Corrow, K., Callas, P.W., Zhar, R., **Howe, A.K.**, Ricci, M.A. 2005. Pressure elevation slows the fibroblast response to wound healing. *J. Vasc. Surg.* **42**:546-551.
14. **Howe, A.K.**, Baldor, L.C., and Hogan, B.P. 2005. Spatial regulation of cAMP-dependent protein kinase during chemotaxis. *Proc. Natl. Acad. Sci. USA* **102**:14320-14325.
15. Langevin, H.M., Bouffard, N.A., Badger, G.J., Churchill, D.L., **Howe, A.K.**. 2006. Subcutaneous tissue fibroblast cytoskeletal remodeling induced by acupuncture: Evidence for a mechanotransduction-based mechanism. *J Cell Physiol.* **207**:767-774.

C. Research Support

Ongoing

5 P20 RR 016435-04 (Parsons, PI) 07/01/06 – 06/30/11
Project 1 (Howe, PI) 07/01/06 – 06/30/11

NIH/NCRR - UVM Neuroscience COBRE

Spatial Regulation of Protein Kinase A Signaling During Growth Cone Guidance

An extension of our pilot project, this project will determine the dynamic localization of PKA in neuronal growth cones and determine the role of PKA anchoring in growth cone morphology, movement, and guidance.

Role: Principal Investigator

1 R01 GM 74204-01 (Howe, PI) 06/01/05 – 05/31/10

NIH/NIGMS

Spatial Regulation of Protein Kinase A in Cell Migration

The goal of this project is to test the hypothesis that PKA is activated specifically in the leading edge of migrating fibroblasts and that this localized activity modulates key regulators of actin cytoskeletal dynamics and cell migration.

Role: Principal Investigator

5 P20 RR 016435-04 (Parsons, PI) 09/30/01 – 06/30/06

Pilot Project A (Howe, PI) 07/01/04 – 06/30/06

NIH/NCRR - UVM Neuroscience COBRE

Regulation of Protein Kinase A Signaling During Growth Cone Guidance

The goal of this pilot project is to determine whether subcellular localization of PKA plays a role in the cytoskeleton-dependent morphology and movement of neuronal growth cones.

Role: Principal Investigator

5 K01 CA 92237-01 (Howe, PI) 08/01/01 – 07/31/06

NIH/NCI (Howard Temin Career Award)

Regulation of Adhesion-Dependent Signaling by PKA and PAK.

The goals of this project are to (1) investigate the mechanism(s) through which the cAMP-dependent protein kinase (PKA) and p21-activated kinase (PAK) regulate the anchorage-dependent cellular response to growth factors and (2) investigate their significance in cell growth and cell motility.

Role: Principal Investigator

Completed

Small Equipment Grant (Howe, PI) 11/17/03 – 03/31/04

Vermont EPSCoR

Instrumentation for Two-Dimensional Gel Electrophoresis – A Multi-user Initiative in Signal Transduction

The goal of this proposal was to obtain funding for isoelectric focusing and high-throughput second-dimension SDS-PAGE equipment.

Role: Principal Investigator

5 P01 RR 16462-05 (Van Houten, PI) 10/01/01 – 05/31/05

NIH/NCRR

Vermont Genetics Network

This is a biomedical infrastructure grant that provides, among other funding, start-up equipment money to new investigators.

Role: New investigator