

Eva A. Turley

ACADEMIC APPOINTMENTS:

1980-1986	Assistant Professor, Dept of Pharmacology, University of Calgary
1986-1990	Associate Professor, Dept of Pharmacology, University of Calgary
1990-1996	Tenured Professor, Dept of Pediatrics/Physiology, Senior Scientist Senior Scientist, Manitoba Institute of Cell Biology, University of Manitoba.
1996-2000	Professor, Dept of Laboratory Medicine and Pathobiology/Anatomy & Cell Biology, University of Toronto Senior Scientist, Division of Cardiovascular Research, Research Institute, The Hospital for Sick Children
2003-2005	Professor, Dept of Oncology, The University of Western Ontario Professor, Dept of Biochemistry, The University of Western Ontario Senior Scientist, Pamela Greenaway-Kohlmeier Translational Breast Cancer Unit Senior Scientist, Cancer Research Laboratories, London Regional Cancer Program at London Health Sciences Centre
2005-present	Oncology Distinguished Scientist, Cancer Research Laboratory Program, London Regional Cancer Program at London Health Sciences Centre; Professor, Dept of Oncology, The University of Western Ontario Professor, Dept of Biochemistry, The University of Western Ontario

INDUSTRIAL EXPERIENCE:

1995-1999:	Vice President for Research, Hyal Corporation, Toronto ON CA
1999-2002	Co-founder and consultant Transition Therapeutics, Toronto ON CA
2002-present	Consultant for: BioMS Therapeutics (Edmonton ALTA CA), Cogent Solutions (Kentucky USA).

CURRENT RESEARCH GRANTS:

Operating Grants:

National/International Funding:

1. **CDMRP-BCRP grant no. BC044087:** "Use of HA-metal nanoparticles to identify and characterize tumorigenic progenitor cell subsets in breast tumors". (E. Turley and M. Bissell, Co-Principle Investigator) June 2005-June 2008 \$112,642 *per annum*.
2. **CDMRP-PCR grant no PC050959:** "The role of hyaluronan, Rhamm and CD44 in prostate cancer progression" (J. McCarthy, Principle Investigator, E. Turley, Co-Investigator). Sept. 2006-August 2009. \$40,623 *per annum*
3. **NIH (SF424-RR):** Hyaluronan Receptors in Prostate Cancer Progression". (J. McCarthy, S.C. Schmechel and E. Turley). \$150,000/anum
4. **Cancer Imaginag Network of Ontario (CINO):** "Radiolabelled Peptide Mimics of Hyaluronan as Molecular Imaging Probes Targeting Hihgly Tumorigenic Cancer Cells". (Leonard Luyt and E. Turley, Co-Principle Investigators). \$68,000/anum

Industrial Funding:

3. **FIDIA PHARMACEUTICALS (ITALY):** “Characterization of hyaluronan synthases and hyaluronan receptors in mesenchymal stem cells of the chondrogenic lineage” (E. Turley, Principle Investigator) January 2005-March 2007 \$34,694 *per annum*.
4. **COGENT SOLUTIONS (USA)** “Assess the Consequences of Oral Cogent Hyaluronan Solutions on Bone Density in Rats”. (E. Turley, Principle Investigator) December 2006-June 2007 \$14,994.76.

Local Funding:

5. **LRCP Small Grants for Cancer Research and Education:** (E. Turley and C. Tolg, Co-Principle Investigators; J. Younus and M. Brackstone, Co-Applicants). “Effect of hyaluronan Accumulation on Cytotoxic Drug Resistance”. January 2006-August 2007. \$23,750
6. **LRCP Small Grants for Cancer Research and Education.** Bridge Funding: Strategy for obtaining funding from CIHR for application entitled “Rhamm is a fibrogenic factor in breast cancer progression”. January 2007-December 2007 \$50,000
7. **Lawson Internal Research Fund.** “To assess the role of Rhamm in promoting a pro-invasive tumor microenvironment in a transgenic model of breast cancer progression”. February 2007-January 2008 \$14,000.

Group Funding:

7. **CIHR grant no. ST2-63287:** “London Strategic Training Initiative in Cancer Research and Technology Transfer” (collaborative partner): CIHR Strategic training program grant competition: \$300,000 *per annum* from the CIHR plus \$367,000 *per annum* from industrial partners, April 1, 2003-March 31-2009. listed researcher/collaborator
8. **CFI-Leading edge/Ontario Research Fund for Research Infrastructure funding:** “Biomedical Multi-modality Hybrid Imaging”. PI: FS Prato, listed researcher/collaborator \$27,912,773 *total*.

Fellowships/Studentships:

1. **LRCP Small Grants for Cancer Research and Training:** “Design and Synthesis of Labeled Hyaluronan Mimics to Identify and Characterize Tumorigenic Progenitor Cell Subsets in Breast Tumors”. (Leonard Luyt and Eva Turley, Co-Principle Investigators). January 2007-September 2007. \$24,823.
2. **Translational Breast Cancer Research Traineeship Program:** Postdoctoral Fellowship (Dr. C. Tolg): “Function of the Extracellular Matrix Component Hyaluronan in Multi-Drug Resistance of Breast Cancer”. August 1, 2006-July 31, 2007 \$36,500 *per annum*.
3. **Translational Breast Cancer Research Traineeship Program:** Studentship (Ms. Sara Hamilton): “Rhamm Promotes Cellular Transformation Through the Regulation of Erk1 Activity and AP-1 Activation”. August 1, 2006-July 31, 2007 \$20,000 *per annum*.

CURRENT PEER REVIEW PANEL/EDITORIAL BOARD/PRIVATE SECTOR PARTICIPATION:

Grants Panels: Virtual College of Reviewers, New Opportunities Fund (2002-present); CIHR (Cancer B: 2006-2009)

Society Memberships: Founding member, International Society of Hyaluronan Sciences (2004-present)

Editorial Boards: Journal of Biological Chemistry (July 2000-2005); Journal of Women and Cancer (1997-present); Private Sector: Consultant for BioMS BioMedical Corporation (Edmonton CA); Chief Scientific Officer, Hawthorne BioMedical Corp. (J. Morris, CEO; J. Kyme, CSO).

PUBLICATIONS: (Life-time total 106)

Book Chapters (2002-present):

1. Harrison R, Wang F-S, **Turley EA**. 2002. RHAMM (CD168) co-associates with and regulates erk kinase. In Hyaluronan. (Kennedy JA, Phillips GO, Williams PA, Ed., Hascall VC, Guest Ed.) Woodhead Publishing Limited, Cambridge, England, Vol. 1, pp. 373-380.
2. Bissell MJ, Mian S, Radisky D, **Turley EA**. 2003 Tissue Specificity: Structural cues allow diverse phenotypes from a constant genotype. In: *Origination of Organismal Form: Beyond the gene in developmental and evolutionary biology*,. (Eds Muller GB, Newman SA,) Vienna Series in Theoretical Biology, A Bradford Book MIT Press, Cambridge MA, pp. 103-118.
3. Hamilton S, Wang F-S, **Turley EA**. 2003 Hyaluronan and hyaladherin signaling in the lung. In: *Proteoglycans in Lung Disease*. (Eds: Garg HG, Roughly PJ, Hales CA) Marcel Dekker, Inc. NY, Vol. 168: pp 107-134.
4. Tolg C, Hamilton SR, **Turley EA**. 2004 The role of the hyaluronan receptor RHAMM in wound repair and tumorigenesis. In: Chemistry and Biology of Hyaluronan (Eds: HG Garg and CA Hales) Elsevier Ltd., New York, NY, pp 125-151.
5. **Turley EA** and Bissel MJ. 2004. Extracellular matrix remodeling in breast branching morphogenesis and breast cancer: the double-edged sword. In Branching Morphogenesis (JA Davies, Editor) Landes Bioscience, Eurekah.com p. 78-95.
6. McCarthy J, **Turley E**, Wilson C, Price M, Bullard K, Beck M, Simpson, M. 2005. Hyaluronan biosynthesis in prostate carcinoma growth and metastasis. In Hyaluronan. (E.A. Balazs and VC. Hascall eds) Matrix Biology Institute, New Jersey pp.317-328.
7. Tolg C, Hamilton SR, Naor, D., McCarthy JB, **Turley EA**. 2005. Analysis of convergent and divergent signaling pathways regulated by Rhamm and CD44: Identification of actin cytoskeleton proteins as Rhamm binding partners. In Hyaluronan (E.A. Balazs and VC. Hascall eds) Matrix Biology Institute New Jersey, pp.861-873.

Invited book chapters submitted

8. **Turley EA** and McCarthy JM. 2007 Rhamm and CD44: partners in the crime of breast tumor progression. In Seminars in Cancer Biology (Ed. Eva Klein) Elsevier Press.
9. McCarthy JM and **Turley EA**. 2007 Rhamm is a regulator of CD44 signaling. In Hyaluronan and Cancer (R. Stern, Ed) Elsevier Press.
10. Veisoh M, **Turley EA**, and Bissell MJ 2007 Hyaluronan metal nanoparticles for imaging breast tumor progenitor subsets. In Nanotechnology and Tissue Engineering: The Scaffold. (L. Nair Ed) CRCPress/Taylor and Francis Group.

Peer-Reviewed Publications (2001-present):

11. **Turley EA**. 2001 Extracellular matrix remodeling: multiple paradigms in vascular disease. *Circ Res* 88:2-4 (editorial).
12. Ziebell MR, Zhao ZG, Luo B, Luo Y, **Turley EA**, Prestwich GD 2001 Peptides that mimic glycosaminoglycans: high-affinity ligands for a hyaluronic binding domain. *Chem Biol* 8:1081-1094.
13. Lynn BD, Li X, Cattini PA, **Turley EA**, Nagy JI 2001 Identification of sequence, protein isoforms and distribution of the hyaluronan-binding protein RHAMM in adult and developing rat brain. *J Comp Neurol* 439:315-330.

14. Lynn BD, **Turley EA**, Nagy JI. 2001 Subcellular distribution, calmodulin interaction and mitochondrial association of the hyaluronan-binding protein RHAMM in rat brain. *J Neurosci Res* 65:6-16.
15. Hall CL, Collis LA, Bo AJ, Lange L, McNicol A, Gerrard JM, **Turley EA**. 2001 Fibroblasts require protein kinase C activation to respond to hyaluronan with increased locomotion. *Matrix Biol* 20:183-192.
16. Harrison RE, **Turley EA**. 2001 Active erk regulates microtubule stability in H-ras-transformed cells. *Neoplasia* 3:385-394.
17. Wang F, Hansen RK, Radisky D, Yoneda T, Barcellos-Hoff MH, Petersen OW, **Turley EA**, Bissell MJ 2002 Phenotypic reversion or death of cancer cells by altering signaling pathways in three-dimensional contexts. *J Natl Canc Inst* 94:1494-1503
18. **Turley EA**, Noble PW, Bourguignon LY. 2002 Signaling properties of hyaluronan receptors. *J Biol Chem* 277:4589-4592.
19. Tammi MI, Day AJ, **Turley EA**. 2002 Hyaluronan and homeostasis: a balancing act. *J Biol Chem* 277:4581-4584.
20. Hall CL, Wang F-S, **Turley EA**. 2003 Src $-/-$ fibroblasts are defective in their ability to disassemble focal adhesions in response to phorbol ester/hyaluronan treatment. *Cell Adhes Commun* 9:273-83.
21. Tolg C, Poon R, Fodde R, **Turley EA**, Alman BA. 2003 Genetic deletion of receptor for hyaluronan mediated motility (Rhamm) attenuates the formation of aggressive fibromatosis (desmoid tumor). *Oncogene* 22:6873-82.
22. **Turley EA**, and McCarthy JB, 2004. Population dynamics and clonal dominance in tumors? *Blood* 104: 909-910.
23. Nedvetzki S, Gonen E, Assayag N, Reich R, Williams RO, Thurmond RL, Huang J-F, Neudecker BA, Wang FS, **Turley EA**, Naor D. 2004 RHAMM, a receptor for hyaluronan-mediated motility, compensates for CD44 in inflamed CD44-knockout mice: a different interpretation of redundancy. 2004 Proc. Natl. Acad. Sci. USA 101:18081-6.
24. Naor D, Nedvetzki S, Assayag N, Thurmond RL, Huang J-F. **Turley EA**. 2005. The mechanism of molecular redundancy in autoimmune inflammation in the context of CD44 deficiency. *NY Acad Sci*. 1050: 52-63.
25. Cook AC, Chambers AF, **Turley EA**, Tuck AB. 2006 Ostoepontin induction of hyalruonan synthase 2 expression promotes breast cancer malignancy. *J Biol Chem* 281:24381-9.
26. Tolg C, Hamilton SR, Kooshesh P, McCarthy JB, Bissell MJ, **Turley EA**. 2006. Rhamm $-/-$ mice are defective in CD44-mediated ERK1,2 motogenic signaling, leading to defective skin wound repair. *J Cell Biol* 175:1017-28.
27. Hamilton SR, Fard, SF, Paiwand FF, Tolg C, Veiseh M, Wang C, McCarthy JB, Bissell MJ, Koropatnick J and **Turley EA**. 2007 The hyaluronan receptors Rhamm and CD44 form complexes with ERK1,2, which sustain high basal motility in breast cancer cells. 2007. *J Biol Chem* 282: 16667-80.
28. **Turley EA**, Veiseh M, and Bissell MJ. 2008. Mechanisms of disease: epithelial-mesenchymal transition—does cellular plasticity fuel neoplastic progression? *Nature Clin Prac Oncology*. 5: 280-90.
29. Maxwell CA, McCarthy J, **Turley E**. 2008 Cell-Surface and Mitotic-spindle RHAMM: moonlighting or dual oncogenic functions? 121: 925-32.

In Review

30. Fard SF, Yang Y, Winnik FM, **Turley EA**, Berg RW, and Koropatnick J. 2007 Enhanced uptake and targeted subcellular location of hyalruonan-ligated thymidylate synthase antisense oliognucelotides in human tumor cells. *Mol Pharm*.

31. Tolg C, Hamilton SR, Kooshesh P, McCarthy JM, **Turley EA** 2007 Hyaluronan binding peptides isolated from random phage libraries modify wound repair in excisional injury of skin. *J. Clin Inves.*
32. Hamilton SR, Tirona RG, Tolg C, Richardson J, Brown R, Gonzalez M, Freeman D, Vanzielegem M, Anderson P, Asculai S, Winnik R, Savani RC, Veiseh M, Koropatnick J and **Turley EA**. 2007 Pharmacokinetics and Pharmacodynamics of hyaluronan infused into human volunteers. *Current Drug Metabolism*.
33. Hamilton S, Zhang S, Tolg C, Bo J, Harrison R, Crump S, McCarthy JB, **Turley EA** (2008) RHAMM/HMMR transforms fibroblasts via ERK1 and AP-1 mediated transcription.
34. Price MA, Yang J, Carlson JH, Ferrone S, **Turley EA**, McCarthy JB. Melanoma chondroitin sulfate proteoglycan promotes tumor cell motility and anchorage-independent growth through Erk1,2-stimulated activation of c-met.

Patents pending/granted (2001-present) (Life-Time total, 95)

1. US patent no. 6,271,344. Title: Enhanced affinity hyaluronan binding peptides. Inventors: Eva Ann Turley. Filed December 16, 1998/Issued August 7, 2001.
2. US Patent no. 6,429,291. Title: Hyaluronan receptor protrein. Inventors: Eva Ann Turley; Shuwen Zhang; Jocelyn Entwistle. Filed June 7, 1995/Issued August 6, 2002.
3. US patent no. 6,475,795. Title: Use of hyaluronan in gene therapy. Inventors: Eva Ann Turley; Samuel S. Asculai. Filed June 16, 1997/Issued November 5, 2002.
4. US patent no 6,429,241. Title: Hyaluronic acid mediated motility receptor (RHAMM). Inventors: Eva Ann Turley; Shuwen Zhang; Jocelyn Entwistle. Filed July 6 1996/Issued August 6, 2002.
5. Us Patent no. 6,537,978. title: Oral administration of effective amounts of forms of hyaluronic acid. Inventors: Eva Ann Turley; Samuel S. Asculai. Filed July 6, 1998/Issued March 25, 2005.
6. US Patent no. 6,852,708. Title: Use of hyaluronic acid and forms to preent the narrowing of the vascular walls. Inventors: Rudolf Edgar Falk; Samuel Asculai; Eva Ann Turley. Filed December 22, 1997/Issued February 8, 2005.
7. US patent no. 6,864,235. Title: Compositions and methods for treating cellular response to injury and other proliferating cell disorders regulated by hyaladherin and hyaluronans. Inventors: Eva Ann Turley; Tony F. Cruz. Filed October 5, 2000/Issued March 8, 2005.
8. US patent no. 6,911,429. Title: Compositons and methods for treating cellular response to injury and other proliferating cell disorders regulated by hyaladherin and hyaluronans. Inventors: Tony Cruz; Aleksandra Pastrak; Eva Ann Turley. Filed October 15, 2001/Issued June 28, 2005.
9. US patent no. A894655US. Title: Dose dependent elimination of HA and cell receptor stimulation. Inventors: Linda Pilarski and Eva Ann Turley. Filed Sept. 2005.
10. Provisional US patent application: Title: Modulation of Rhamm (CD168) for selective adipose tissue development. Inventors: Eva A. Turley and Mina J. Bissell. Submitted December 2006.
11. Provisional US patent application: Detection of tumorigenic progenitor cells. Inventors: Eva A. Turley and Mina J. Bissell. Submitted December 2006.

