

Trygve O. Tollefsbol

Education:

- B.S. University of Houston, 1974
- M.S. University of North Texas, 1977
- D.O. University of North Texas Health Sciences Center, 1979
- Ph.D. University of North Texas, 1982

Positions Held:

- Physician, University of North Texas Health Center, 1979-1982
- Postdoctoral Fellow, Duke University Medical Center, 1982-1984
- Assistant Professor, Michigan State University, 1984-1985
- Senior Fellow, Duke University Medical Center, 1985-1988
- Research Biologist, Geriatric Research, Education, and Clinical Center, 1985-1988
- Assistant Research Professor, Duke University Medical Center, 1985-1988
- Surgical Resident, Medical Center of Central Georgia, 1988-1989
- Senior Postdoctoral Fellow, University of North Carolina at Chapel Hill, 1990-1998
- Assistant Professor, Department of Biology, University of Alabama at Birmingham, 1998-2004
- Scientist, UAB Center for Aging, 1999-present
- Member, Southeast Center for Excellence in Geriatric Medicine, 1999-2005
- Director, UAB Cell Senescence Culture Facility, 2000-present
- Core Member, UAB Basic Biology of Aging Program, 2000-present
- Scientist, UAB Comprehensive Cancer Center, 2000-present
- Preceptor, UAB Dental School, 2000-2004
- Assistant Professor, UAB Vision Science Research Center, 2000-2004
- Preceptor, UAB Center for Research in Clinical and Applied Gerontology, 2000-2004
- Steering Committee Member, UAB Center for Aging, 2001-present
- Science Advisory Board, 2002-present
- GRECC Affiliated Investigator, 2003-present
- Scientist, UAB Arthritis and Musculoskeletal Center, 2004-present
- Associate Professor with tenure, UAB Department of Biology, 2004-present
- Scientist, Clinical Nutrition Research Center, 2006-present

Publications (Full-length; Peer-reviewed):

Berletch, J., Liu, C., Love, W.K., Andrews, L.G., Katiyar, S. and **Tollefsbol, T.O.** Epigenetic and genetic mechanisms contribute to telomerase inhibition by EGCG. *Journal of Cellular Biochemistry* 103, 509-519, 2008.

Cunningham, A.P., Andrews, L.G., and **Tollefsbol, T.O.** Retrovirus-mediated RNA interference: Targeting hTERT through stable expression of short hairpin RNA. *Methods in Molecular Biology* 405, 39-46, 2008.

Love, W.K., Berletch, J.B., Andrews, L.G., and **Tollefsbol, T.O.** Epigenetic regulation of telomerase in retinoid-induced differentiation of human leukemia cells. *International Journal of Oncology* 32, 625-631, 2008.

Andrews, L.G. and **Tollefsbol, T.O.** Methods of telomerase inhibition. *Methods in Molecular Biology* 405, 1-8, 2008.

Saldanha, S.N., Nandakumar, V., Elgavish, A., and **Tollefsbol, T.O.** Dietary and environmental influences on histone modifications in cancer. In: *Cancer Epigenetics* (In Press), 2008.

DeAngelis, J.T., Farrington, W., and **Tollefsbol, T.O.** An overview of epigenetic assays. *Molecular Biotechnology* 38, 179-183, 2008.

Sanders, Y, Cisneros, J., Selman, M., Nuovo, G.J., **Tollefsbol, T.O.**, and Hagood, J.S. Epigenetic regulation of Thy-1 in lung fibroblasts: A novel pathogenic mechanism in idiopathic pulmonary fibrosis. *American Journal of Respiratory Cell and Molecular Biology* (In Press), 2008.

Saldanha, S.N., and **Tollefsbol, T.O.** Alterations in histone acetylation in tumorigenesis. In: *Cancer Epigenetics* (In Press), 2008.

Lai, S.R., Andrews, L.G., and **Tollefsbol, T.O.** hTERT knockdown in human embryonic kidney cells using double-stranded RNA. *Methods in Molecular Biology* 405, 23-29, 2008.

DeAngelis, J.T., Berletch, J.B., Andrews, L.G. and **Tollefsbol, T.O.** Hypermethylation and oncogenesis. In: *Cancer Epigenetics* (In Press), 2008.

Liu, L., Li, Y., and **Tollefsbol, T.O.** Gene-environment interactions and epigenetic basis of human diseases. *Current Issues in Molecular Biology* 10, 25-36, 2008.

Walthall, S.L., Phipps, S.M.O., Andrews, L.G., and **Tollefsbol, T.O.** Proteins that modulate DNA methylation aberrations in cancer. In: *Cancer Epigenetics* (In Press), 2008.

Lai, S.R., Andrews, L.G., and **Tollefsbol, T.O.** RNA interference using a plasmid construct expressing short hairpin RNA. *Methods in Molecular Biology* 405, 31-37, 2008.

Tollefsbol, T.O. The role of epigenetics in cancer. In: *Cancer Epigenetics* (In Press), 2008.

Lai, S.R., Cunningham, A.P., Huynh, V.Q., Andrews, L.G., and **Tollefsbol, T.O.** Evidence of extra-telomeric effects of hTERT and its regulation involving a feedback loop. *Experimental Cell Research* 313, 322-330, 2007.

Tollefsbol, T.O. Techniques for analysis of biological aging. *Methods in Molecular Biology* 371, 1-7, 2007.

Liu, L., van Groen, T., Kadisha, I. and **Tollefsbol, T.O.** DNA methylation impacts on learning and memory in aging. *Neurobiology of Aging* [epub ahead of print] PMID: 17850924, 2007. *Listed among the top 8 "hottest articles" published in this journal by ScienceDirect's Top25 Hottest Articles, 2008.*

Hansen, N.J., Wylie, R.C., Phipps, S., Love, W.K., Andrews, L.G., and **Tollefsbol, T.O.** The low-toxicity 9-*cis* UAB30 novel retinoid down-regulates the DNA methyltransferases and has

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Berletch, J.B., Andrews, L.G., and **Tollefsbol, T.O.** A method to detect DNA methyltransferase I gene transcription in vitro in aging systems. *Methods in Molecular Biology* 371, 73-80, 2007.

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Liu, L., Andrews, L.G., and **Tollefsbol, T.O.** Loss of the polycomb protein BMI-1 promotes cancer-specific cell death. *Oncogene* 25, 4370-4375, 2006.

Stuardi, T., Phipps, S.M.O., and **Tollefsbol, T. O.** Integrins and cancer: Gene expression, epigenetics and metastasis. *Current Genomics* 7, 323-331, 2006.

Cunningham, A.P., Love, W.K., Zhang, R.W., Andrews, L.G., and **Tollefsbol, T.O.** Telomerase inhibition in cancer therapeutics: Molecular-based approaches. *Current Medicinal Chemistry* 13, 2875-2888, 2006.

Phipps, S.M.O., Woodfin, W.K., and **Tollefsbol, T.O.** The epigenetics of breast carcinogenesis and metastasis. *Current Genomics* 6, 129-135, 2005.

Ulrey, C.L., Liu, L., Andrews, L.G., and **Tollefsbol, T.O.** The impact of metabolism on DNA methylation. *Human Molecular Genetics* 14, R139-R147, 2005. *Listed among the top 25 most frequently read articles published in Human Molecular Genetics.*

Lai, S.R., Phipps, S.M.O., Liu, L., Andrews, L.G., and **Tollefsbol, T.O.** Epigenetic control of telomerase and modes of telomere maintenance in aging and abnormal systems. *Frontiers in Bioscience* 10, 1779-1796, 2005.

Liu, L., Lai, S., Andrews, L.G., and **Tollefsbol, T.O.** Genetic and epigenetic modulation of telomerase activity in development and disease. *Gene* 340, 1-10, 2004. *Listed among the top 4 "hottest articles" published in Gene by ScienceDirect's Top25 Hottest Articles.*

Tollefsbol, T.O. Methods of epigenetic analysis. *Methods in Molecular Biology*, 287, 1-8, 2004.

Liu, L., Berletch, J.B., Green, J., Pate, M.S., Andrews, L.G., and **Tollefsbol, T.O.** Telomerase inhibition by retinoids precedes cyto-differentiation of HL60 leukemia cells and may contribute to terminal differentiation. *Molecular Cancer Therapeutics* 3, 1003-1009, 2004.

Liu, L., Saldanha, S.N., Pate, M.S., Andrews, L.G., and **Tollefsbol, T.O.** Epigenetic regulation of human telomerase reverse transcriptase promoter activity during cellular differentiation. *Genes, Chromosomes, and Cancer* 41, 26-37, 2004.

Mittal, A., Pate, M.S., Wiley, R., **Tollefsbol, T.O.** and Katiyar, S.K. EGCG down-regulates telomerase in human breast carcinoma MCF-7 cells, leading to suppression of cell viability and induction of apoptosis. *International Journal of Oncology* 24, 703-710, 2004.

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Hansen, N.J., Poole J.C., Andrews, L.G, and **Tollefsbol, T.O.** Telomerase: structure and function. In: Cooper DN (ed.) *Nature's Encyclopedia of the Human Genome*, 5, 478-483. London: Nature Publishing Group, 2003.

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Poole, J.C., Andrews, L.G., and **Tollefsbol, T.O.** Activity, function, and gene regulation of the catalytic subunit of telomerase (hTERT). *Gene* 269, 1-12, 2001. *Among the top down-loaded articles from ScienceDirect according to the Editors of Gene.*

Tollefsbol, T.O. and Andrews, L.G. Mechanisms for telomerase gene control in aging cells and tumorigenesis. *Medical Hypotheses* 56, 630-637, 2001. Listed as recommended reading by the *Telomeres Information Center* web site.

Ahmed, A. and **Tollefsbol T.O.** Telomeres and telomerase: Basic science implications for aging. *Journal of the American Geriatrics Society* 49, 1105-1109, 2001. *Cited as one of the Best Papers of 2001 in Geriatric Pathology.*

Tollefsbol, TO and Hutchison, CA, III. Analysis in *Escherichia coli* of the effects of *in vivo* CpG methylation catalyzed by the cloned murine maintenance methyltransferase. *Biochemical and Biophysical Research Communications* 245, 670-678, 1998.

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Tollefsbol, TO and Hutchison, CA, III. Mammalian DNA-(cytosine-5)-methyltransferase expressed in *Escherichia coli*, purified and characterized. *Journal of Biological Chemistry* 270, 18543-18550, 1995.

Adey, NB, **Tollefsbol, TO**, Sparks, AB, Edgell, MH, and Hutchison, CA, III. Molecular resurrection of an extinct ancestral promoter for mouse L1. *Proceedings of the National Academy of Sciences USA* 91, 1569-1573, 1994. Commentaries, *Science* 264, 27, 1994 and *Nature* 374, 12, 1995. (Joint first-authorship)

Tollefsbol TO and Andrews LG: Mechanisms for methylation-mediated gene silencing and aging. *Medical Hypotheses* 41, 83-92, 1993.

Tollefsbol TO and Cohen HJ: The protein synthetic surge in response to mitogen triggers high glycolytic enzyme levels in human lymphocytes and occurs prior to DNA synthesis. *Biochemical Medicine and Metabolic Biology* 44, 282-291, 1990.

Tollefsbol TO and Cohen HJ: The effects of aging on phosphofructokinase induction during lymphocyte mitogenesis in relation to DNA and protein synthesis. *Molecular and Cellular Biochemistry* 75, 113-122, 1987.

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Tollefsbol TO and Cohen HJ: Expression of intracellular biochemical defects of lymphocytes in aging: Proposal of a general aging mechanism which is not cell-specific. *Experimental Gerontology* 21, 129-148, 1986.

Tollefsbol TO and Cohen HJ: Role of protein molecular and metabolic aberrations in aging, in the physiological decline of the aged, and in age-associated diseases. *Journal of the American Geriatrics Society* 34, 282-294, 1986.

Tollefsbol TO and Cohen HJ: Culture kinetics of glycolytic enzyme induction, glucose utilization, and thymidine incorporation in extended-exposure phytohemagglutinin-stimulated human lymphocytes. *Journal of Cellular Physiology* 122, 98-104, 1985.

Tollefsbol TO and Cohen HJ: Carbohydrate metabolism of transforming lymphocytes from the elderly. *Journal of Cellular Physiology* 123, 417-424, 1985.

Gracy RW, Chapman ML, Cini JK, Jahani M, **Tollefsbol TO**, and Yuksel KU: Molecular basis of the accumulation of abnormal proteins in progeria and aging fibroblasts. *Basic Life Sciences* 35, 427-442, 1985.

Tollefsbol TO and Cohen HJ: Decreased protein synthesis of transforming lymphocytes from aged humans: Relationship to impaired mitogenesis with age. *Mechanisms of Ageing and Development* 30, 53-62, 1985.

Tollefsbol TO and Cohen HJ: The effect of age on the accumulation of labile triosephosphate isomerase and thymidine incorporation in pokeweed mitogen stimulated human lymphocytes. *Journal of Gerontology* 39, 398-405, 1984.

Tollefsbol TO and Cohen HJ: Werner's syndrome: An underdiagnosed disorder resembling premature aging. *Age (Journal of the American Aging Association)* 7, 75-88, 1984.

Tollefsbol TO and Gracy RW: Premature aging diseases: Cellular and molecular changes. *Bioscience* 33, 634-639, 1983.

Tollefsbol TO, Zaun MR, and Gracy RW: Increased lability of triosephosphate isomerase in progeria and Werner's syndrome fibroblasts. *Mechanisms of Ageing and Development* 20, 93-101, 1982.

Tollefsbol TO, Chapman ML, Zaun MR, and Gracy RW: Impaired glycolysis of human lymphocytes during aging. *Mechanisms of Ageing and Development* 17, 369-379, 1981.

Tollefsbol TO and Gracy RW: Proteolytic modification of phosphoglycerate kinase from lymphoblasts. *Archives of Biochemistry and Biophysics* 205, 280-282, 1980.

Full-length Scientific Publications Not Peer-reviewed:

Strickland, L., Berletch, J., and **Tollefsbol, T.O.** Protein expression and methylation patterns in response to glucose depletion in MCF-7 cells. *Inquiro* 1, 47-49, 2007.

Woodfin, W., Andrews, L.G. and **Tollefsbol, T.O.** Transcription of DNA methyltransferases in retinoid-induced leukemia differentiation. *McNair Chronicle* 6, 66-70, 2005.

Woodfin, W., Andrews, L.G. and **Tollefsbol, T.O.** 9cUAB30 retinoid-induced differentiation and telomerase activity of human leukemia cells. *McNair Chronicle* 5, 85-88, 2004.

Williams, A., Lai, S., Woodfin, W.F., Wylie, R., and Tollefsbol, T.O. Expression of retinoic acid receptors in differentiating human leukemia cells. *McNair Chronicle* 5, 82-84, 2004.

Woodfin, W.F., Berletch, J., Phipps, S., Andrews, L.G. and **Tollefsbol, T.O.** hTERT transcription and telomerase activity in terminally differentiating human leukemia cells. *McNair Chronicle* 4, 134-140, 2003.

Parikh, S., Saldanha, S., and **Tollefsbol, T.O.** Investigation of telomerase expression using luciferase and TRAP assays. Proceedings of the First Annual University of Alabama System Honors Research Day 1, 27-30, 2002.

Bryant, R. and **Tollefsbol, T.O.** The effects of all-trans 9-cis and UAB30 retinoic acids on human breast cancer cells. *McNair Chronicle* 3, 24-26, 2002.

Books:

Epigenetics Protocols. **Tollefsbol, T.O.** (ed.) Humana Press, Methods in Molecular Biology, Vol. 287 (ISBN 1-58829-336-X), 2004. *Listed by Amazon.com in March of 2005 as the best selling book in the field of epigenetics over the past 10 years.* 302 pages.

"Comprehensive and easy to use...offers investigators readily reproducible techniques that will further promote progress in this critically important field"—review by Tumori (an international Journal of Experimental and Clinical Oncology).

"Tollefsbol (U. of Alabama) and contributors offer a wide array of leading-edge analytical methods and techniques suitable for studying fundamental biological processes and therapeutic interventions"—review by Powell's Books.

Biological Aging: Methods and Protocols. **Tollefsbol, T.O.** (ed.) Humana Press, Methods in Molecular Biology, (ISBN 1-58829-658-X), 2007. 414 pages.

"Smart researcher, good protocols"—online review by Ruben Agrelo.

"This can be a useful book for biogerontologists. The range and variety of experimental model systems and the cellular and molecular methods employed to address questions in basic and applied aging research require a book like this where one can access practical information and advice. ...a welcome source of useful information for researchers intending to find their way into descriptive, analytical and interventive research in biogerontology." Suresh Rattan, *Biogerontology* DOI 10.1007/s10522-007-9120-8, 2008.

"Reminiscent of the excellent books on organic chemistry techniques...this book is written with deep understanding and a sense of sharing. For research gerontologists, this book is a boon." David O. Staats, M.D. (University of Oklahoma Health Sciences Center), *Doody Review Services, Barnes & Nobel, 2008.*

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Cancer Epigenetics. **Tollefsbol, T.O.** (ed.) CRC Press (Taylor & Francis Group), (ISBN 9781420045796) (In press), 2008. 448 pages (projected).

Epigenetics of Aging. **Tollefsbol, T.O.** (ed.) Springer Publications (In Progress), 2008.