

## BIOGRAPHICAL SKETCH

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NAME George A. Calin, M.D., Ph.D.		POSITION TITLE Associate Professor	
eRA COMMONS USER NAME			
EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i> )			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania	MD	1992	Medicine
"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania	PHD	2000	Gastroenterology

### A. Positions and Honors.

#### Positions and Employment

1996-2002 Assistant Professor on Gastroenterology at "Carol Davila" University, Bucharest, Romania  
2004 Research Instructor (July to September) at Thomas Jefferson University, Philadelphia, PA  
2004-2006 Research Assistant Professor at Ohio State University, Columbus, OH  
2006-2007 Assistant Professor at Ohio State University, Columbus, OH  
2007 Associate Professor, Department of Experimental Therapeutics, UT M. D. Anderson Cancer Center, Houston, Texas

#### Honors

1985 Award at the National Competition on Human Anatomy, Romania  
1987 Award at the National Competition on Human Anatomy, Romania  
1988 Award at the National Competition on Human Physiology, Romania  
1997-1998 The Yamagiwa-Yoshida Memorial International Cancer Study Grant by the International Union Against Cancer (Geneva) at the University of Ferrara, Italy  
1998-1999 International Research Training Fellowship by the International Agency for Research on Cancer (Lyon) at the University of Ferrara, Italy

#### Teaching Responsibilities

2004 MCMB course (Molecular and Cellular Basis of Medicine) – course "Cancer is a disease of the genome" at Thomas Jefferson University  
2006 PHARMACY 805 course (Pharmaceutical Biotechnology) - course "Cancer is a disease of the genome" at Ohio State University

### B. Selected Peer-reviewed Publications (in chronological order).

(Publications selected from 80 peer-reviewed publications)

1. **Calin GA** & Croce CM. MicroRNA involvement in human cancers. *Journal of Clinical Oncology Educational Book*, in press, 2007.
2. **Calin GA** & Croce CM. Investigation of microRNAs alterations in leukemias and lymphomas. *Methods in Enzymology*. In press, 2007.
3. **Calin GA**, Pekarsky Y & Croce CM. The role of microRNAs and other non-coding RNAs in the pathogenesis of chronic lymphocytic leukemia. *Best Practice & Research Clinical Hematology*, 2007 Sept;20(3):425-37.
4. **Calin GA**, Liu CG, Ferracin M, Hyslop T, Spizzo R, Sevignani C, Fabbri M, Cimmino A, Lee EJ, Wojcik SE, Shimizu M, Tili E, Rossi S, Taccioli C, Pichiorri F, Liu X, Zupo S, Herlea V, Gramantieri L, Lanza G, Alder H, Rassenti L, Volinia S, Schmittgen TD, Kipps TJ, Negrini M, Croce CM. Ultraconserved Regions Encoding ncRNAs Are Altered in Human Leukemias and Carcinomas. *Cancer Cell*. 2007 Sep;12(3):215-29.
5. Lanza G, Ferracin M, Gafa R, Veronese A, Spizzo R, Pichiorri F, Liu CG, **Calin GA**, Croce CM, Negrini M.

- mRNA/microRNA gene expression profile in microsatellite unstable colorectal cancer. *Mol Cancer*. 2007 Aug 23;6(1) :54
6. Yendamuri S, Trapasso F, Ferracin M, Cesari R, Sevignani C, Shimizu M, Rattan S, Kuroki T, Dumon KR, Bullrich F, Liu CG, Negrini M, Williams NN, Kaiser LR, Croce CM, **Calin GA**. Tumor Suppressor Functions of ARLTS1 in Lung Cancers. *Cancer Res*. 2007 Aug 15;67(16):7738-45.
  7. **Calin GA** & Croce CM. Chromosomal rearrangements and microRNAs: a new cancer link with clinical implications. *J Clin Invest.*, 2007 Aug;17(8):2059-66.
  8. Gramantieri L, Ferracin M, Fornari F, Veronese A, Sabbioni S, Liu CG, **Calin GA**, Giovannini C, Ferrazzi E, Grazi GL, Croce CM, Bolondi L, Negrini M. Cyclin G1 is a target of miR-122a, a microRNA frequently down-regulated in human hepatocellular carcinoma. *Cancer Res.*, 2007 Jul 1;67(13):6092-9.
  9. Fabbri M, Ivan M, Cimmino A, Negrini M, **Calin GA**. Regulatory mechanisms of microRNAs involvement in cancer. *Expert Opin Biol Ther*. 2007 Jul;7(7): 1009-19.
  10. Kulshreshtha R, Ferracin M, Negrini M, **Calin GA**, Davuluri RV, Ivan M. Regulation of microRNA expression: the hypoxic component. *Cell Cycle*. 2007 Jun 15;6(12):1426-31. Epub 2007 May 7.
  11. Garzon R, Pichiorri F, Palumbo T, Visentini M, Aqeilan R, Cimmino A, Wang H, Sun H, Volinia S, Alder H, **Calin GA**, Liu CG, Andreeff M, Croce CM. MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia. *Oncogene*. 2007 Jun 14;26(28):4148-57. Epub 2007 Jan 29.
  12. Visone R, Pallante P, Vecchione A, Cirombella R, Ferracin M, Ferraro A, Volinia S, Coluzzi S, Leone V, Borbone E, Liu CG, Petrocca F, Troncone G, **Calin GA**, Scarpa A, Colato C, Tallini G, Santoro M, Croce CM, Fusco A. Specific microRNAs are downregulated in human thyroid anaplastic carcinomas. *Oncogene*. 2007 Jun 11; [Epub ahead of print]
  13. Sevignani C, **Calin GA**, Nnadi SC, Shimizu M, Davuluri RV, Hyslop T, Demant P, Croce CM, Siracusa LD. MicroRNA genes are frequently located near mouse cancer susceptibility loci. *Proc Natl Acad Sci U S A*. 2007 May 8;104(19):8017-22. Epub 2007 Apr 30.
  14. Georgantas RW 3rd, Hildreth R, Morisot S, Alder J, Liu CG, Heimfeld S, **Calin GA**, Croce CM, Civin CI. CD34+ hematopoietic stem-progenitor cell microRNA expression and function: A circuit diagram of differentiation control. *Proc Natl Acad Sci U S A*. 2007 Feb 9; 104(8):2750-5; [Epub ahead of print]
  15. Kulshreshtha R, Ferracin M, Wojcik SE, Garzon R, Alder H, Agosto-Perez FJ, Davuluri R, Liu CG, Croce CM, Negrini M, **Calin GA**, Ivan M. A MicroRNA Signature of Hypoxia. *Mol Cell Biol*. 2007 27(5):1859-67.
  16. Bottoni A, Zatelli MC, Ferracin M, Tagliati F, Piccin D, Vignali C, **Calin GA**, Negrini M, Croce CM, DegliUberti EC. Identification of differentially expressed microRNAs by microarray: a possible role for microRNAs genes in pituitary adenomas. *J Cellular Physiology*, 2007 Feb ;210(2):370-7.
  17. Pekarsky Y, Santanam U, Cimmino A, Palamarchuk A, Efanov A, Maximov V, Volinia S, Alder H, Liu CG, Rassenti L, **Calin GA**, Hagan JP, Kipps T, Croce CM. Tcl1 expression in chronic lymphocytic leukemia is regulated by miR-29 and miR-181. *Cancer Res*. 2006 Dec 15;66(24):11590-3.
  18. Garzon R, Fabbri M, Cimmino A, **Calin GA**, Croce CM. MicroRNA expression and function in cancer. *Trends Mol Med*. 2006 Dec;12(12):580-7. Epub 2006 Oct 30.
  19. Petrocca F, Iliopoulos D, Qin HR, Nicoloso MS, Yendamuri S, Wojcik SE, Shimizu M, Di Leva G, Vecchione A, Trapasso F, Godwin AK, Negrini M, **Calin GA\***, Croce CM. Alterations of the Tumor Suppressor Gene ARLTS1 in Ovarian Cancer. *Cancer Res*. 2006 Nov 1;66(21):10287-91.
  20. **Calin GA**, Croce CM. A signatures in human cancers. *Nat Rev Cancer*. 2006 Nov;6(11):857-66.
  21. **Calin GA**, Croce CM. MicroRNAs and chromosomal abnormalities in cancer cells. *Oncogene*. 2006 Oct 9;25(46):6202-10. Review
  22. Roldo C, Missiaglia E, Hagan JP, Falconi M, Capelli P, Bersani S, **Calin GA**, Volinia S, Liu CG, Scarpa A, Croce CM. MicroRNA expression abnormalities in pancreatic endocrine and acinar tumors are associated with distinctive pathologic features and clinical behavior. *J Clin Oncol*. 2006 Oct 10;24(29):4677-84. Epub 2006 Sep 11.
  23. **Calin GA**, Croce CM. MicroRNAs and chromosomal abnormalities in cancer cells. *Oncogene*. 2006 Oct 9;25(46):6202-10. Review
  24. **Calin GA**, Croce CM. MicroRNA-Cancer connection: the beginning of a new tale. *Cancer Res* 2006 Aug 1 66:7390-7394. Review.
  25. Di Leva G, **Calin GA**, Croce CM. MicroRNAs: fundamental facts and involvement in human diseases. *Birth Defects Res C Embryo Today*. 2006 Jun;78(2):180-9. Review
  26. Shi B, Prisco M, **Calin G**, Liu CG, Russo G, Giordano A, Baserga R. Expression profiles of micro RNA in proliferating and differentiating 32D murine myeloid cells. *J Cell Physiol*. 2006 Jun;207(3):706-10.

27. **Calin GA**, Garzon R, Cimmino A, Fabbri M, Croce CM. MicroRNAs and leukemias: how strong is the connection? *Leuk Res*. 2006 Jun;30(6):653-5. Epub 2005 Dec 2. No abstract available.
28. **Calin GA**, Croce CM. Genomics of chronic lymphocytic leukemia microRNAs as new players with clinical significance. *Semin Oncol*. 2006 Apr;33(2):167-73. Review.
29. Garzon R, Pichiorri F, Palumbo T, Luliano R, Cimmino A, Aqeilan R, Volinia S, Bhatt D, Alder H, Marcucci G, **Calin GA**, Liu CG, Bloomfield CD, Andreeff M, Croce CM. MicroRNA fingerprints during human megakaryocytopoiesis. *Proc Natl Acad Sci U S A*. 2006 Mar 20;
30. Yanaihara N, Caplen N, Bowman E, Seike M, Kumamoto K, Yi M, Stephens RM, Okamoto A, Yokota J, Tanaka T, **Calin GA**, Liu CG, Croce CM, Harris CC. Unique microRNA molecular profiles in lung cancer diagnosis and prognosis. *Cancer Cell*. 2006 Mar;9(3):189-98.
31. Sevignani C, **Calin GA**, Siracusa LD, Croce CM. Mammalian microRNAs: a small world for fine-tuning gene expression. *Mamm Genome*. 2006 Mar;17(3):189-202. Epub 2006 Mar 3.
32. Shi B, Prisco M, **Calin G**, Liu CG, Russo G, Giordano A, Baserga R. Expression profiles of micro RNA in proliferating and differentiating 32D murine myeloid cells. *J Cell Physiol*. 2006 Jun;207(3):706-10
33. Volinia S\*, **Calin GA\***, Liu CG, Ambs S, Cimmino A, Petrocca F, Visone R, Iorio M, Roldo C, Ferracin M, Prueitt RL, Yanaihara N, Lanza G, Scarpa A, Vecchione A, Negrini M, Harris CC, Croce CM. A microRNA expression signature of human solid tumors defines cancer gene targets. *Proc Natl Acad Sci U S A*. 2006 Feb 14;103(7):2257-61. Epub 2006 Feb 3.
34. Zanesi N, Aqeilan R, Drusco A, Kaou M, Sevignani C, Costinean S, Bortesi L, La Rocca G, Koldovsky P, Volinia S, Mancini R, **Calin G**, Scott CP, Pekarsky Y, Croce CM. Effect of rapamycin on mouse chronic lymphocytic leukemia and the development of nonhematopoietic malignancies in Emu-TCL1 transgenic mice. *Cancer Res*. 2006 Jan 15;66(2):915-20.
35. He H, Jazdzewski K, Li W, Liyanarachchi S, Nagy R, Volinia S, **Calin GA**, Liu CG, Franssila K, Suster S, Kloos RT, Croce CM, de la Chapelle A. The role of microRNA genes in papillary thyroid carcinoma. *Proc Natl Acad Sci U S A*. 2005 Dec 27;102(52):19075-80. Epub 2005 Dec 19.
36. Felli N, Fontana L, Pelosi E, Botta R, Bonci D, Facchiano F, Liuzzi F, Lulli V, Morsilli O, Santoro S, Valtieri M, **Calin GA**, Liu CG, Sorrentino A, Croce CM, Peschle C. MicroRNAs 221 and 222 inhibit normal erythropoiesis and erythroleukemic cell growth via kit receptor down-modulation. *Proc Natl Acad Sci U S A*. 2005 Dec 13;102(50):18081-6. Epub 2005 Dec 5.
37. **Calin GA**, Garzon R, Cimmino A, Fabbri M, Croce CM. MicroRNAs and leukemias: How strong is the connection? *Leuk Res*. 2005 Dec 1; [Epub ahead of print]
38. Pekarsky Y, **Calin GA**, Aqeilan R., Croce CM. Chronic lymphocytic leukemia: molecular genetics and animal models. *Curr Top Microbiol Immunol*. 2005;294:51-70. Review.
39. **Calin GA**, Ferracin M, Cimmino A, Di Leva G, Shimizu M, Wojcik SE, Iorio MV, Visone R, Sever NI, Fabbri M, Iuliano R, Palumbo T, Pichiorri F, Roldo C, Garzon R, Sevignani C, Rassenti L, Alder H, Volinia S, Liu CG, Kipps TJ, Negrini M, Croce CM. A MicroRNA signature associated with prognosis and progression in chronic lymphocytic leukemia. *N Engl J Med*. 2005 Oct 27;353(17):1793-801.
40. Cimmino A \*, **Calin GA\***, Fabbri M, Iorio MV, Ferracin M, Shimizu M, Wojcik SE, Aqeilan RI, Zupo S, Dono M, Rassenti L, Alder H, Volinia S, Liu CG, Kipps TJ, Negrini M, Croce CM. miR-15 and miR-16 induce apoptosis by targeting BCL2. *Proc Natl Acad Sci U S A*. 2005 Sep 27;102(39):13944-9. Epub 2005 Sep 15. Erratum in: *Proc Natl Acad Sci U S A*. 2006 Feb 14;103(7):2464.
41. Iorio MV, Ferracin M, Liu CG, Veronese A, Spizzo R, Sabbioni S, Magri E, Pedriali M, Fabbri M, Campiglio M, Menard S, Palazzo JP, Rosenberg A, Musiani P, Volinia S, Nenci I, **Calin GA**, Querzoli P, Negrini M, Croce CM. MicroRNA gene expression deregulation in human breast cancer. *Cancer Res*. 2005 Aug 15;65(16):7065-70.
42. Zanesi N, Mancini R, Sevignani C, Vecchione A, Kaou M, Valtieri M, **Calin GA**, Pekarsky Y, Gnarr JR, Croce CM, Huebner K. Lung cancer susceptibility in Fhit-deficient mice is increased by Vhl haploinsufficiency. *Cancer Res*. 2005 Aug 1;65(15):6576-82.
43. Croce CM, **Calin GA**. miRNAs, cancer, and stem cell division. *Cell*. 2005 Jul 15;122(1):6-7. Review.
44. **Calin GA**, Trapasso F, Shimizu M, Dumitru CD, Yendamuri S, Godwin AK, Ferracin M, Bernardi G, Chatterjee D, Baldassarre G, Rattan S, Alder H, Mabuchi H, Shiraishi T, Hansen LL, Overgaard J, Herlea V, Mauro FR, Dighiero G, Movsas B, Rassenti L, Kipps T, Baffa R, Fusco A, Mori M, Russo G, Liu CG, Neuberger D, Bullrich F, Negrini M, Croce CM. Familial cancer associated with a polymorphism in ARLTS1. *N Engl J Med*. 2005 Apr 21;352(16):1667-76.
45. Sarti M, Sevignani C, **Calin GA**, Aqeilan R, Shimizu M, Pentimalli F, Picchio MC, Godwin A, Rosenberg A, Drusco A, Negrini M, Croce CM> Adenoviral transduction of TESTIN gene in breast and uterine cancer

- cell lines promotes apoptosis and tumor reduction in vivo. *Clin Cancer Res.* 2005 Jan 15;11(2 Pt 1):806
46. Miotto E, Sabbioni S, Veronese A, **Calin GA**, Gullini S, Liboni A, Gramantieri L, Bolondi L, Ferrazzi E, Gafa R, Lanza G, Negrini M. Frequent aberrant methylation of the CDH4 gene promoter in human colorectal and gastric cancer. *Cancer Res.* 2004 Nov 15;64(22):8156-9.
47. **Calin GA**, Liu CG, Sevignani C, Ferracin M, Felli N, Dumitru CD, Shimizu M, Climmino A, Zupo S, Dono M, Dell'Aquila ML, Alder H, Rassenti L, Kipps TJ, Bullrich F, Negrini M, Croce CM. Micro RNA profiling reveals distinct signatures in B cell chronic lymphocytic leukemias. *Proc Natl Acad Sci U.S.A.* 2004 Aug 10;101(32):11755-60. epub 2004 Jul 29.
48. Liu CG, **Calin GA**, Meloon B, Gamliel N, Sevignani C, Ferracin M, Dumitru CD, Shimizu M, Zupo S, Dono M, Alder H, Bullrich F, Negrini M, Croce CM. An oligonucleotide microchip for genome-wide microRNAs profiling in human and mouse tissue. *Proc Natl Acad Sci U.S.A.* 2004 Jun 29;101(26):970-4. Epub 2004 Jun 21.
49. Prisco, M, Maiorana A, Guerzoni C, **Calin G**, Calabretta B, Voit R, Grummt I, Baserga R. Role of pescadillo and upstream binding factor in the proliferation and differentiation of murine myeloid cells. *Mol Cell Biol.* 2004 Jun;24(12):5421-33.

\* - shared first authorship.

### **Expertise Summary**

My main research interests are: 1) the involvement of non-coding RNAs in human diseases in general and the involvement of microRNAs in human cancers in particular, and 2) the study of familial predisposition to human cancers. For these goals I am using bioinformatics, genomics and proteomics approaches, as well as functional studies in cancer cells.

### **C. Research Support.**

#### **Ongoing Research Support**

1/11/2005-1/31/2008      CLL Global Research Foundation      \$200,000  
 Title: Role of microRNAs in familial chronic lymphocytic leukemia.  
**PI: George Calin, M.D., Ph.D.**  
**Effort – 1.2 CM**

*The major goal of this project is to define the extent of microRNA involvement in familial Chronic Lymphocytic Leukemia (CLL).*

#### **Pending Research Support**

10/01/07 – 9/30/09      American Association for Cancer Research  
 Title: microRNAs and Other non-coding RNAs in Colorectal Metastasis  
**PI: George Calin, M.D., Ph.D.**  
**Effort Calin – 0.6 CM**

*The major goal of this project is to identify the involvement of ncRNA in colorectal metastasis.*

3/01/2009 - 2/29/2012      DOD grant  
 Title: Treatment of Breast Cancer with Vaccines that Target microRNAs  
 PI: Dr. Edward Cohen, **Co-PI: George Calin, M.D., Ph.D.**  
**Effort – 0.6 CM**

*The major goal is to prove that a vaccine that targets miRNAs essential for the survival of breast cancer cells will result in tumor cell-death.*

#### **Completed Research Support**

06/2004-06/2006      Kimmel Cancer Foundation Scholar  
 Title: Role of microRNAs in cancer  
**PI: George Calin, M.D., Ph.D.**

*The major goal of this project is to define the extent of microRNA involvement in human cancers, including leukemias and solid tumors.*