

BIOGRAPHICAL SKETCH

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NAME		POSITION TITLE	
Cleary, Michael L		Professor of Pathology and Pediatrics	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
College of Wooster, Wooster, OH	B.A.	1974	Chemistry
University of South Carolina, Columbia, SC	M.S.	1976	Chemistry
University of Cincinnati, Cincinnati, OH	M.D.	1981	Medicine
Stanford University, Stanford, CA		1981-1983	Pathology Resident
Stanford University, Stanford, CA		1983-1986	Postdoctoral Fellow

A. Positions and Honors**Positions and Employment**

1981-1983	Intern and Resident, Department of Pathology, Stanford University School of Medicine
1983-1986	Postdoctoral Scholar, Department of Pathology, Stanford University School of Medicine
1986-1991	Assistant Professor of Pathology, Stanford University School of Medicine
1991-1999	Associate Professor of Pathology, Stanford University School of Medicine
1999-	Professor of Pathology, Stanford University School of Medicine
2002-	Professor of Pediatrics, Stanford University School of Medicine

Other Experience and Professional Memberships

1983-1985	Fellow of the Jane Coffin Childs Memorial Fund for Medical Research
1985-1991	Scholar of the Lucille P. Markey Charitable Trust
1987, 1988	Robert W. Cahill Faculty Prize in Cancer Research, Stanford University
1991-1996	Scholar of the Leukemia Society of America
1996	Warner-Lambert Parke-Davis Award of the American Society of Investigative Pathology
1999-	MERIT Award, NCI/NIH (CA42971)
2000-2003	Board of Scientific Counselors, NCI

B. Selected peer-reviewed publications (representative out of 145 total)

1. Nourse, J., Melletin, J.D., Galili, N., Wilkinson, J., Stanbridge, E., Smith, S.D. and **Cleary, M.L.** 1990. Chromosomal translocation t(1;19) results in synthesis of a homeobox fusion mRNA that codes for a potential chimeric transcription factor. *Cell* 60:535-545.
2. Monica, K., Chen-Levy, Z. and **Cleary, M.L.** 1990. Small G proteins are expressed ubiquitously in lymphoid cells and do not correspond to Bcl-2. *Nature* 346:189-191.
3. Tkachuk, D.C., Westbrook, C.A., Andreeff, M., Donlon, T.A., **Cleary, M.L.**, Suryanarayan, K., Homge, M., Redner, A., Gray, J., and Pinkel, D. 1990. Detection of BCR-ABL fusion in chronic myelogenous leukemia by two-color fluorescence *in situ* hybridization. *Science* 250:559-562.
4. Hunger, S.P., Ohyashiki, K., Toyama, K. and **Cleary, M.L.** 1992. HLF, a novel hepatic bZIP protein, shows altered DNA-binding properties following fusion to E2A in t(17;19) - ALL. *Genes & Dev.* 6:1608-1620.
5. Tkachuk, D.C., Kohler, S. and **Cleary, M.L.** 1992. Involvement of a homolog of Drosophila trithorax by 11q23 chromosomal translocations in acute leukemias. *Cell* 71:691-700.
6. Deder, D.A., Waller, E.K., LeBrun, D.P., Sen-Majumbar, A., Stevens, M.E., Barsh, G.S., and **Cleary, M.L.** 1993. Chimeric homeobox gene E2A-PBX1 induces proliferation, apoptosis, and malignant lymphomas in transgenic mice. *Cell* 74:833-843.

7. Chang, C-P., Shen, W-F, Rozenfeld, S., Lawrence, H.J., Largman, C. and **Cleary, M.L.** 1995. Pbx proteins display hexapeptide-dependent cooperative DNA binding with a subset of Hox proteins. *Genes & Dev.* 9:663-674.
8. Chang, C-P., DeVivo, I., and **Cleary, M.L.** 1997. The Hox cooperativity motif of chimeric oncoprotein E2a-Pbx1 is necessary and sufficient for oncogenesis. *Mol. Cell. Biol.* 17:81-88.
9. Lavau, C., Szilvassy, S., Slany, R., and **Cleary, M.L.** 1997. Immortalization and leukemic transformation of a myelomonocytic precursor by retrovirally transduced HRX-ENL. *EMBO J.* 16:4226-4237.
10. Cui, X., De Vivo, I., Slany, R., Miyamoto, A., Firestein, R. and **Cleary, M.L.** 1998. Association of SET domain and myotubularin-related proteins modulates growth control. *Nature Genet.* 18:331-337.
11. Piper, D., Bachelor, A., Chang, C-P., **Cleary, M.L.** and Wolberger, C. 1999. Structure of a HoxB1-Pbx1a heterodimer bound to DNA: Role of the hexapeptide and a fourth homeodomain helix in complex formation. *Cell* 96:587-597.
12. Jacobs, Y., Schnabel, C.A. and **Cleary, M.L.** 1999. Trimeric association of Hox and TALE homeodomain proteins mediates Hoxb2 hindbrain enhancer activity. *Mol. Cell. Biol.* 19:5134-5142.
13. Firestein, R., Cui, X., Huie, P. and **Cleary, M.L.** 2000. SET domain-dependent regulation of transcriptional silencing and growth control by SUV39H1, a mammalian ortholog of Drosophila Su(var)3-9. *Mol. Cell. Biol.* 20:4900-4909.
14. Selleri, L., Depew, M.J., Jacobs, Y., Chanda, S., Cheah, K., Rubenstein, J.L.R., O'Gorman, S., and **Cleary, M.L.** 2001. Requirement for Pbx1 in skeletal patterning and programming of chondrocyte proliferation and differentiation. *Development* 128:3543-3557.
15. DiMartino, J., Selleri, L., Traver, D., Firpo, M., Rhee, J. W., Warnke, R., O'Gorman, S., Weissman, I.L., and **Cleary, M.L.** 2001. The Hox cofactor and proto-oncogene Pbx1 is required for maintenance of definitive hematopoiesis in the fetal liver. *Blood* 98:618-626.
16. Kim, S.K., Selleri, L., Lee, J. S., Zhang, A.Y., Gu, X., Jacobs, Y., and **Cleary, M.L.** 2002. Pbx1 inactivation disrupts pancreas development and in *lpf1*-deficient mice promotes diabetes mellitus. *Nature Genetics* 30:430-435.
17. Nagy, P.L., Griesenbeck, J., Kornberg, R.D., and **Cleary, M.L.** 2002. A trithorax-group complex purified from *S. cerevisiae* is required for methylation of histone H3. *Proc. Natl. Acad. Sci. USA*, 99:90-94.
18. DiMartino, J.F., Ayton, P.M., Chen, E.H., Nafzger, C.C., Young, B.D., and **Cleary, M.L.** 2002. The leucine zipper domain of AF10 confers myeloid transforming activity to the MLL-AF10 fusion protein. *Blood* 99:3780-3785.
19. Yokoyama, A., Kitabayashi, I., Ayton, P.M., **Cleary, M.L.**, and Ohki, M. 2002. Leukemia proto-oncoprotein MLL is proteolytically processed into two fragments with opposite transcriptional properties. *Blood* 100:3710-3718.
20. So, C.W. and **Cleary, M.L.** 2002. MLL-AFX requires the transcriptional effector domains of AFX to transform myeloid progenitors and trans-dominantly interfere with forkhead protein function. *Mol. Cell. Biol.* 22:6542-6552.
21. So, C.W., Karsunky, H., Passequé, E., Cozzio, A., Weissman, I.L. and **Cleary, M.L.** 2003. MLL-GAS7 transforms multipotent hematopoietic progenitors and induces mixed lineage leukemias in mice. *Cancer Cell* 3:161-171.
22. Smith, K.S., Chanda, S., Lingbeek, M., Ross, D.T., Botstein, D., Brown, P.O., van Lohuizen, M., and **Cleary, M.L.** 2003. Bmi-1 regulation of INK4A-ARF is a downstream requirement for transformation of hematopoietic progenitors by E2a-Pbx1. *Mol. Cell* 12:393-400.
23. So, C.W., Lin, M., Ayton, P.M., Chen, E.H., and **Cleary, M.L.** 2003. Dimerization contributes to oncogenic activation of MLL chimeras in acute leukemias. *Cancer Cell* 4:99-110.
24. Ayton, P.M. and **Cleary, M.L.** 2003. Transformation of myeloid progenitors by MLL oncoproteins is dependent on Hoxa7 and Hoxa9. *Genes & Dev.* 17:2298-2307.
25. Schnabel, C.A., Selleri, L. and **Cleary, M.L.** 2003. Defects in adrenal development and urogenital differentiation in Pbx1 deficient mice. *Genesis* 37:123-130.
26. Cozzio, A., Passequé, E., Ayton, P.M., Karsunky, H., **Cleary, M.L.**, and Weissman, I.L. 2003. Similar MLL-associated leukemias arising from self-renewing stem cells and short-lived myeloid progenitors. *Genes & Dev.* 17:3029-3035.
27. Yokoyama, A., Wang, Z., Wysocka, J., Sanyal, M., Aufiero, D.J., Kitabayashi, I., Herr, W., and **Cleary, M.L.** 2004. Leukemia proto-oncoprotein MLL forms a SET1-like histone methyltransferase complex with menin to regulate Hox gene expression. *Mol. Cell. Biol.* 24:5639-5649.

C. Research Support

Ongoing Research Support

5 R37 CA 42971-19 Cleary (PI) 04/01/99-03/31/07
NIH/NCI (MERIT award)

Molecular Pathology of Human Lymphoid Malignancies

The overall objectives of this proposal address the hypothesis that Hox proteins normally function as higher order trimeric complexes with members of the TALE (three amino acid loop extension) superclass of homeodomain proteins whose representatives include Pbx and Meis/Pknox1 proteins. The proposed studies also address whether the oncogenic activities of Pbx and Hox chimeric proteins in leukemias result from subversions of normal trimeric constraints on the transcriptional functions of the respective wild type homeodomain proteins.

Role: PI

5 R01 CA 55029-14 Cleary (PI) 07/01/99-04/30/09
NIH/NCI

Pathology and Biology of Leukemia Oncogenes

The long-term objectives of this project are to investigate the potential bi-functional role of wild type MLL, in the maintenance or repression of gene expression, and disruption of its transcriptional inter-conversion by leukemogenic mutations in human leukemias with 11q23 chromosomal translocations.

Role: PI

1 RO1 CA90735-04 Cleary (PI) 04/17/01-03/31/06
NIH/NCI

Role of Pbx Proteins in Hematopoiesis and Growth Control

The studies in this project will determine the contributions of Pbx proteins to hematopoiesis and growth control through analysis of Pbx null mice and cells.

Role: PI

2 P01 CA34233-21 Levy (PI) 04/01/00-03/31/05
NIH/NCI

Parent: Clinical and Laboratory Studies of Malignant Lymphomas

Project 4: Notch Signaling Pathways in Lymphomagenesis (Cleary)

Parent: This program has three major aspects, Clinical Trials, Tumor Cell Biology and Pathogenesis of malignant lymphomas, all of which take advantage of significant new developments and findings made by the projects leaders and by others in the field.

Project 4: This project investigates the role of ectopic Notch ligand expression in the pathogenesis of lymphoid malignancies.

Role: PI project 4