

## CURRICULUM VITAE

NAME: David Steven Leibowitz

DATE AND PLACE OF BIRTH: Los Angeles, California December 26, 1949

MARITAL STATUS: Married

### HOME ADDRESS

445 Turner Terrace  
San Mateo, CA 94401  
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### EDUCATION:

May, 1977 M.D., Columbia College of Physicians & Surgeons  
New York, NY

May, 1972 B.A., Columbia College, New York, NY

1967-1969 Cowell College, University of California,  
Santa Cruz, CA

### TRAINING AND APPOINTMENTS:

2022- Chairman, PNHP-California

2021- Vice Chairman, SF South Bay Chapter, Physicians for a National  
Health Program (PNHP)

2008-2012 Director of Clinical Innovation, PAMF Program of Excellence in  
Cancer Care

2006-2010 Department Head, Medical Oncology and Hematology

2004- Partner, The Palo Alto Medical Clinic

2001-2004 Employed Physician, The Palo Alto Medical Clinic  
Clinical Instructor, Department of Medicine, Stanford University

- 2001- Senior Physician, TPMG
- 2001-2004 Participant Physician, The Permanente Medical Group (TPMG)  
Attending Physician, STCH
- 1998-2000 Associate Physician, TPMG  
Attending Physician, Santa Teresa Community Hospital (STCH)
- 1995-1998 Professor of Medicine (tenured)  
Professor of Medical and Molecular Genetics  
Member, Walther Oncology Center  
Indiana University School of Medicine, Indianapolis, IN
- 1989-1995 Associate Professor of Medicine (tenured)  
Associate Professor of Medical and Molecular Genetics  
Associate Member Walther Oncology Center  
Indiana University School of Medicine, Indianapolis, IN
- 1983-1989 Assistant Professor of Medicine  
Columbia College of Physicians & Surgeons, New York, NY  
Assistant Attending Physician, Medical Service  
The Presbyterian Hospital, New York, NY
- 1980-1983 Hematology-Oncology Fellow, Department of Medicine,  
Columbia-Presbyterian Medical Center, New York, NY
- 1978-1980 Medical Resident, Department of Medicine, The Presbyterian  
Hospital, New York, NY. Columbia College of Physicians &  
Surgeons
- 1977-1978 Medical Intern, The Osler Medical Service, The Johns Hopkins  
Hospital, Baltimore, MD.

AWARDS: National Cancer Institute, Clinical Investigator Award  
American Cancer Society, Junior Faculty Research Award

CERTIFICATION AND LICENSURE:

Diplomate, American Board of Internal Medicine: Internal Medicine,  
Medical Oncology, Hematology  
Diplomate, National Board of Medical Examiners  
Licensed to practice medicine in New York

Licensed to practice medicine in Indiana  
 Licensed to practice medicine in California

PROFESSIONAL SOCIETY MEMBERSHIP:

American Association for the Advancement of Science  
 American College of Physicians (Fellow)  
 American Society of Hematology  
 American Society of Clinical Oncology  
 American Association for Cancer Research  
 American Society of Human Genetics  
 Santa Clara County Medical Association  
 California Medical Association

STANDING COMMITTEES AND BOARDS:

2014-2017	Member, ASCO Cancer Education Committee, Leukemia, Myelodysplasia, and Transplantation Track
2007-2019	Oncology Subject Matter Expert Electronic Health Records, Sutter Health
2007-2012	Leadership Council, Palo Alto Medical Foundation Program of Excellence in Cancer,
1999-2008	Editorial Board, <u>Clinical Lymphoma</u>
2000-2001	Chairman, Transfusion Committee, STCHMC
1999-2001	Kaiser-Permanente Northern California Bone Marrow Transplant Advisory Committee
1999-2001	Kaiser-Permanente Northern California Regional Oncology Clinical Trials Steering Committee
1999-2001	Member, Ethics Committee, STCHMC
1999-2001	Member, Transfusion Committee, Santa Teresa Community Hospital and Medical Center (STCHMC)
1996-1998	Co-Director, Hematology/Oncology Fellowship Program Indiana University School of Medicine
1996-1998	Member, Central Society for Clinical Research, Hematology/Oncology Sub-Specialty Committee
1996-1997	Chairman, Research and Development Committee, Indianapolis VAMC
1994-1995	Chairman, VA Research Advisory Group A
1994-1997	Member, Research and Development Committee, Indianapolis VAMC
1993-1997	Director, Research Program in Cell Cycle and Gene Regulation, Indiana University Cancer Center
1995-1996	President, Mid-West Blood Club

1991-1996	Councilor, Mid-West Blood Club
1991-1993	University of California, Tobacco-Related Disease Research Program, Biomedical Science and Cancer Career Development Study Section
1987-1990	Member, Merit Review Board for Oncology, Veterans Administration
1986-1989	Member, Immunology and Genetics Core Committee, Cancer and Leukemia Group B
1988-1989	Membership Chairman, New York Society for the Study of Blood
1987-1988	Program Chairman, New York Society for the Study of Blood

### GRANTS, FELLOWSHIPS AND AWARDS:

#### As trainee

1. Hematology/Oncology Fellow, Columbia-Presbyterian Medical Center, 1980-1983, NIH Institutional Training Grant.

#### As Principal Investigator

1. Biomedical Research Support Grant, Columbia University, 1983-84. NIH, \$20,000.
2. Core grant seed money, Columbia University Comprehensive Cancer Center, 1983-84, NIH, \$20,000.
3. Clinical Investigator Award, National Cancer Institute, 1985-88. NIH, \$160,000.
4. Research Grant (R01-CA 44028), Molecular Biology of CML, NCI, 1987-90. \$360,000.
5. Junior Faculty Research Award, American Cancer Society, 1/1/88-12/31/90. \$92,000.
6. NCI: Prognostic Implications of the Ph<sup>1</sup> chromosome translocation in CML. Program project with Cancer and Leukemia Group B (CALGB), 1987-1992, \$250,000. (Project stopped after move to Indiana University, as of 3/31/90).
7. Research Grant, American Cancer Society, BCR/ABL Gene Regulation in Chronic Myelogenous Leukemia, 7/1/91-6/30/94, \$270,000.
8. Biomedical Research Support Grant, Indiana University, 4/1/91-3/31/92, NIH, \$25,000.
9. Merit Review Award, Veterans' Administration, Signals that Regulate BCR/ABL, \$345,000; 10/1/93-9/30/96.
10. Research Grant, American Cancer Society, PI = Hoffman: Isolation of normal hematopoietic stem cells from CML marrow, co-investigator, 7/1/93-6/30/95, \$249,000.
11. NCI: Dose intensification by gene transduction in human cancer, PI = D. Williams; Project 3, Cornetta/Hoffman: Gene therapy for chronic myelogenous leukemia, co-investigator, 10/1/92-9/30/96, \$480,000.00

12. American Cancer Society: Regulation of the BCR Promoter in CML, \$226,000.00, 7/1/94-6/30/96.
13. Merit Review Board, Veterans' Administration, Signals that Regulate BCR/ABL, \$423,000.00, 4/1/97-3/31/02

## BIBLIOGRAPHY

1. Mears, J.G., Ramirez, F., Leibowitz, D., Nakamura, F., Bloom, A., Konoty-Ahulu, F., and Bank, A. Changes in restricted human cellular DNA fragments containing globin gene sequences in the thalassemia syndromes and related disorders. Proc. Natl. Acad. Sci. 75:1222, 1978
2. Mears, J.G., Ramirez, F., Leibowitz, D., and Bank, A. Organization of human delta and beta globin genes in cellular DNA and the presence of intragenic inserts. Cell 15:15, 1978
3. Mears, J.G., Ramirez, F., Leibowitz, D. and Bank, A. Gene Mapping in Thalassemia. New England Journal of Medicine 299:1258, 1978 (Letter)
4. Burns, A.L., Spence, S., Kosche, K., Ramirez, F., Mears, J.G., Schreiner, H., Miller, C., Baird, M., Leibowitz, D., Giardina, P., Markenson, A., and Bank, A. Isolation and characterization of cloned DNA: The Delta and Beta-globin genes in homozygous Beta-plus thalassemia. Blood, 57:140, 1981
5. Leibowitz, D., Cubbon, R., and Bank, A. Increased expression of a novel c-abl related RNA in K562 cells. Blood, 65:526, 1985
6. Leibowitz, D., Schaefer-Rego, K., Popenoe, D., Mears, J.G., and Bank, A. Variable breakpoints on the Philadelphia chromosome in chronic myelogenous leukemia. Blood, 66:243, 1985
7. Young, K., Margulies, L., Donovan-Peluso, M., Clyne, J., Driscoll, M.C., Dobkin, C., Leibowitz, D., Russo, G., Schiliro, G., and Bank, A. Structure and expression of two beta genes in a beta thalassemia homozygote. J. of Molec. and App. Genetics, 3:1, 1985
8. Popenoe, D.W., Schaefer-Rego, K., Mears, J.G., Bank, A., and Leibowitz, D. Frequent and extensive deletion during the 9,22 translocation in CML. Blood, 68:1123, 1986
9. Schaefer-Rego, K., Dudek, H., Popenoe, D., Arlin, Z., Mears, J.G., Bank, A., and Leibowitz, D. CML patients in blast crisis have breakpoints localized to a specific region of the bcr. Blood 70:448-455, 1987
10. Arlin, Z. A., Leibowitz, D., and Clarkson, B. Pseudo-Philadelphia-positive acute lymphoblastic leukemia (Ph1+ALL). J. Clin. Onc. 5:512, 1987 (Letter)

11. Leibowitz, D. and Young, K. RNA isolation and processing. In Benz, E. (Ed.): Methods in Hematology: Molecular Genetics Techniques, vol 11. New York: Churchill Livingstone, 1989.
12. Schaefer-Rego, K., Arlin, Z., Shapiro, L., Mears, J.G., and Leibowitz, D. Molecular Heterogeneity of Adult Philadelphia Chromosome Positive ALL. Cancer Research 48:866-869, 1988.
13. Rubin, C.M., Carrino, J.J., Dickler, M.N., Leibowitz, D., Smith, S., and Westbrook, C.A. Heterogeneity of genomic fusion of BCR and ABL in Philadelphia chromosome positive acute lymphoblastic leukemia. Proc. Natl. Acad. Sci.(U.S.A.) 85:2795-2799, 1988.
14. Arlin, Z.A., Feldman, E.J., Ahmed, T., Leibowitz, D., Shapiro, L.R., Wilmot, P.L. Philadelphia chromosome positive (Ph<sup>1+</sup>) lymphoblastic leukemia (ALL) is resistant to effective therapy for Ph<sup>1(-)</sup> ALL. Acta Haematol. (Basel) 81:217-218, 1989.
15. Hooberman, A.L., Carrino, J.J., Leibowitz, D.L., Rowley, J.D., Le Beau, M.M., Arlin, Z.A., Westbrook, C.A. Unexpected heterogeneity of BCR/ABL fusion mRNA detected by polymerase chain reaction in Philadelphia chromosome positive acute lymphoblastic leukemia. Proc.Natl.Acad.Sci.(U.S.A.) 86:4259-4263, 1989.
16. Leibowitz, D. Breakpoint mapping in CML. Blood 73:1745, 1989 (letter).
17. Leibowitz, D. Overview: Molecular biology of CML. Cancer Investigation 7:195-203, 1989.
18. Leibowitz, D. The molecular biology of chronic myelogenous leukemia. In Cossman, J. (Ed.): Molecular Genetics and the Diagnosis of Cancer, pp 179-188. Elsevier Science Publishing, New York, 1990.
19. Leibowitz, D. Variation of BCR/ABL breakpoint and its relationship to prognosis. In Deisseroth, A. and Arlinghaus, R. (Eds.): Chronic Myelogenous Leukemia: Molecular Approaches to Research and Therapy, pp 209-216. Marcel Dekker, Inc., New York, 1991.
20. Schaefer-Rego, K.E., Leibowitz, D., and Mears, J.G. Chromatin alterations surrounding the BCR-Abl fusion gene in K562 cells. Oncogene 5:1669-1673, 1990.
21. Weinberg, R.S., Leibowitz, D., Weinblatt, M.E., Kochen, J., Alter, B.P. Juvenile chronic myelogenous leukemia(JCML): The only example of truly fetal (not fetal-like) erythropoiesis. British Journal of Haematology, 76:307-309, 1990.
22. Leibowitz, D., Popenoe, D., Mears, J.G., Bank, A., Schaefer-Rego, K. ABL oncogene expression during erythroleukemia cell differentiation. Leukemia Research 15:65-70, 1991.

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26. Mandanas, R.A., Boswell, H.S., Leibowitz, D. BCR/ABL confers growth factor independence upon a murine myeloid cell line. Leukemia, 6:796-800, 1992.
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Mascarenhas J, Kosiorek HE, Prchal JT, Rambaldi A, Berenzon D, Yacoub A, Harrison CN, McMullin MF, Vannucchi AM, Ewing J, O'Connell CL, Kiladjian JJ, Mead AJ, Winton EF, **Leibowitz DS**, De Stefano V, Arcasoy MO, Kessler CM, Catchatourian R, Rondelli D, Silver RT, Bacigalupo A, Nagler A, Kremyanskaya M, Levine MF, Arango Ossa JE, McGovern E, Sandy L, Salama ME, Najfeld V, Tripodi J, Farnoud N, Penson AV, Weinberg RS, Price L, Goldberg JD, Barbui T, Marchioli R, Tognoni G, Rampal RK, Mesa RA, Dueck AC, Hoffman R. A randomized phase 3 trial of interferon- $\alpha$  vs hydroxyurea in polycythemia vera and essential thrombocythemia. *Blood*. 2022 May 12;139(19):2931-2941

#### ABSTRACTS

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2. Meehan, J., Ramirez, F., Mears, J.G., Leibowitz, D., O'Donnell, J.V., and Bank, A. Extent of deletion of Alpha-globin genes in homozygous Alpha thalassemia. *Clin. Res.* 26:330A, 1978
3. Mears, J.G., Ramirez, F., Leibowitz, D., and Bank, A. Organization of human globin genes in normal and thalassemic DNA. *Clin. Res.* 26:506A, 1978
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genes from normal and Beta-plus thalassemia cells. Second Conference on Hemoglobin Switching, Airlie House, Virginia, June 22-26, 1980

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8. Leibowitz, D.S., Miller, C.W., Donovan-Peluso, M., Cubbon, R., and Bank, A. Organization of c-abl in K562 cells. RNA Tumor Virus Meeting, Cold Spring Harbor, New York, 1983
9. Leibowitz, D., Schaefer-Rego, K., Popenoe, D., Mears, J.G., and Bank, A. Variable position of the breakpoint of the Ph1 translocation in chronic myelogenous leukemia. Blood Suppl. 64:203A, 1984
10. Schaefer-Rego, K., Leibowitz, D., and Mears, J.G. DNAase I hypersensitive sites 5' to v-abl locus in Ph1 positive K562 cells. Blood Suppl. 64:205A, 1984
11. Leibowitz, D., Schaefer-Rego, K., Popenoe, D., Mears, J.G., and Bank, A. Variable position of the breakpoint of the Ph1 translocation in chronic myelogenous leukemia (CML). J. Cell. Biochem. Suppl. 9A:86, 1985
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13. Leibowitz, D., Schaefer-Rego, K., Popenoe, D., Mears, J.G., and Bank, A. Variability of the location of breakpoints on the Philadelphia chromosome. Clin. Res. 33:547A, 1985
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15. Popenoe, D., Schaefer-Rego, K., Mears, J.G., Bank, A., and Leibowitz, D. Changes in expression of the c-abl oncogene in erythroleukemia cell differentiation. First Annual Meeting on Oncogenes, p60; Frederick, Maryland; July, 1985
16. Leibowitz, A., Dudek, H., Schaefer-Rego, K., Popenoe, D., Arlin, Z., Mears, J.G., and Bank, A. Rearrangement and deletion during the Philadelphia chromosome translocation. Blood Suppl., 66:239A, 1985

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22. Leibowitz, D., Schaefer-Rego, K., Arlin, Z., Shapiro, L., Mears, J.G., and Bank, A. Molecular heterogeneity of Adult Ph<sup>+</sup> ALL. J. of Cellular Biochemistry Supplement 11A:195, 1987
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24. Weinberg, R.S., Kochen, J., Weinblatt, M.E., Leibowitz, D., and Alter, B.P. Juvenile chronic myelogenous leukemia (JCML): The only example of truly fetal (not fetal-like) erythropoiesis. Blood Suppl. 70:212a, 1987.
25. Rubin, C.M., Carrino. J.J., Hooberman, A.L., Dickler, M.N., Leibowitz, D., Smith, S.D., and Westbrook, C.A. Translocation breakpoints occur 50 kb upstream of bcr in PH1-positive acute lymphoblastic leukemia (ALL). Blood Suppl. 70:285a, 1987.
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27. Leibowitz, D., and Dudek, H. Non-homologous recombination during the t(9;22) creating the Philadelphia chromosome. Clinical Research 36:413A, 1988.

28. Leibowitz, D., Wells, C., Kaysen, J., Donovan-Peluso, M. DNA binding proteins within the bcr on the Ph<sup>1</sup> chromosome. Blood Suppl.:181a, 1988.
29. Leibowitz, D., Westbrook, C., Carrino, J., Silver, R. Polymerase chain reaction (PCR) for the detection of alternative splicing and molecular classification of CML. Blood Suppl.:211a, 1988.
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32. Leibowitz, D., Young, K.S.. DNA binding protein map of the bcr on the Ph<sup>1</sup> chromosome. Blood Suppl. 74:166a, 1989.
33. Leibowitz, D., Young, K., Cox, G. Localization of DNA binding proteins within the bcr on the Ph<sup>1</sup> chromosome. First meeting on The Molecular Basis of Human Cancer, p 76, Frederick, Maryland, 1990.
34. Leibowitz, D., Cox, G., Young, K. bcr intron factor-1 (BIF-1) binds to the Mbc intron region of the Ph chromosome. Blood Suppl., 76:237a, 1990.
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36. Mandanas, R., Boswell, HS, Bruno, E., Hoffman R., Leibowitz, D. Murine mast cell line achieves growth factor independence with BCR/ABL. Seventh Annual Meeting on Oncogenes, Frederick Maryland, p87, 1991.
37. Leemhuis, T., Leibowitz, D., Cox, G., Srour, E.F., Tricot, G., Hoffman, R. Identification of BCR/ABL-negative progenitor cells within CML marrow. Blood Suppl., 78:28a, 1991.
38. Mandanas, R., Boswell, HS, Leibowitz, D. Transformation of myeloid cell line by BCR/ABL involves constitutive expression of c-JUN and c-FOS. Blood Suppl., 78:330a, 1991.
39. Stewart, M., Reifel-Miller, A., Kim, SY., Westbrook, C., Leibowitz, D. Major transcriptional suppressor within the breakpoint cluster region on the Philadelphia chromosome. Clinical Research, 40:301a, 1992.

40. Cornetta, K., Moore, A., Leemhuis, T., Leibowitz, D., Tricot, G., Hoffman, R. High efficiency retroviral gene transfer into chronic myelogenous leukemia cells. Blood Suppl., 80:157a, 1992.
41. Mandanas, R.A., Leibowitz, D., Gharehbaghi, K., Jayaram, H.N., Boswell, H.S. Role of p21RAS in p210 BCR-ABL-transformation of a murine myeloid cell line. Blood Suppl., 80:14a, 1992.
42. Stewart, M.J., Litz-Jackson, S., Burgess, G.S., Leibowitz, D., Boswell, H.S. A cyclin -dependent retinoblastoma pathway controls c-myc transcription by p210 BCR-ABL. Exp. Hematology 21:1159, 1993.
43. Tauchi, T., Boswell, H.S., Leibowitz, D., Broxmeyer, H.E. Coupling between p210BCR-ABL and SHC adaptor protein links Philadelphia chromosome product to RAS pathway. Exp. Hematology, 21:1072, 1993.
44. Stewart, M.J., Cox, G., Reifel-Miller, A., Kim, S.Y., Westbrook, C.A., Leibowitz, D.S. A novel transcriptional suppressor located within a downstream intron of the BCR gene. Blood Suppl., 82:114a, 1993.
45. Mack, D.L., and Leibowitz, D. Cloning strategy for the novel transcriptional suppressors binding within a downstream intron of the BCR gene. Blood Suppl., 84:139a, 1994.
46. Mack, D.L., and Leibowitz, D. Progress in cloning the transcriptional suppressors binding within a downstream intron of the BCR gene. Blood Suppl., 86:734a, 1995.
47. Williamson, I., Gautier, D., Leibowitz, D. BCR/ABL expression is decreased when adownstream silencer is present on the Ph<sup>1</sup> chromosome. Blood Suppl., 88:573a, 1996.
48. Hale, R., Leibowitz, D. Decreased level of STAT1 in cells transformed to growth factor independence by BCR/ABL. Blood Suppl. 88:575a, 1996.

Dr Leibowitz' career had two parts, first roughly 20 years doing research, and then 20 years practicing hematology-oncology. He was outraged by the expense of new cancer drugs and the profit-taking by oncologists, insurance companies, and drug companies. He joined PNHP in 2017 to help remake the US healthcare system.