A. IDENTIFYING DATA

1. Name	Michael F. Clarke, M.D.
2. Date/Place of Birth	May 28, 1951/Indianapolis, Indiana
3. Ethnicity	White
4. U.S. Citizen	Yes
5. California Medical Licensure	C52663
Michigan Medical License	#4301049987

B. ACADEMIC HISTORY

COLLEGES AND UNIVERSITIES, DEGREES, AND DATES

1969-1973	B.A., Indiana University; Indianapolis, Indiana
1973-1977	M.D., Indiana University; Indianapolis, Indiana

POST-DOCTORAL AND RESIDENCY TRAINING

1977-1978	Intern, University of Missouri Medical Center, Columbia, Missouri
1978-1980	Resident, Indiana University Medical Center, Indianapolis, Indiana

BOARD ELIGIBILITY OR BOARDS PASSED

1980	Diploma, American Board of Internal Medicine
1984	Board certification, Oncology

OTHER STUDY AND RESEARCH OPPORTUNITIES

1995	Senior Postdoctoral Training/special leave for research in Department of Pathology, Stanford University School of Medicine (Dr. Irving L. Weissman Laboratory)

C. EMPLOYMENT

ACADEMIC APPOINTMENTS

1980-1983	Clinical Associate, Medicine Branch, National Cancer Institute, National Institutes of Health, Bethesda, Maryland
1983-1986	Staff Fellow, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, Maryland
1986-1992	Assistant Professor, Internal Medicine, Department of Hematology and Oncology, University of Michigan, Ann Arbor, Michigan
1992-1998	Associate Professor, Internal Medicine, Department of Hematology and Oncology, University of Michigan, Ann Arbor, Michigan
1992-2005	Attending Physician, University of Michigan Bone Marrow Transplant Unit, Ann Arbor, Michigan
1992-2005	Attending Physician, University of Michigan, Lymphoma Clinic
1998-2005	Professor, Internal Medicine, Department of Hematology and Oncology, University of Michigan, Ann Arbor, Michigan
2003-2005	Professor of Cell and Development Biology, University of Michigan, Ann Arbor, Michigan
2005-present	Professor of Internal Medicine, The Karel and Avice Beekhuis Endowed Professorship in Cancer Biology, Associate Director of the Stanford Institute for Stem Cell Biology and Regenerative Medicine, Stanford, California

D. PUBLIC AND PROFESSIONAL SERVICE

COMMITTEE AND ADMINISTRATIVE SERVICE

1987-1992	Thesis Committee, Karen Moertel, Pharmacology
1987-present	Graduate Program in Molecular and Cellular Biology
1989-present	Faculty Advisor for Medical Students
1990-present	Internal Medicine House Staff Evaluation and Recruitment
1992-1994	House Staff Selection Committee
1994-present	Thesis Committee, Mary Benedict, Molecular & Cellular Biology
1996-1999	Thesis Committee, Qun Zeng, Biology
2001-present	Member of Center of Organogenesis
2004-2006	American Society of Hematology Stem Cell Committee

COMMUNITY SERVICE

American Cancer Society
Nature Conservancy
Science Day at the Ann Arbor Public Schools, 1987-1991
Interfaith Homeless Shelter

MILITARY SERVICE

1980-1983	Public Health Service - Discharged as Lieutenant 04
1983-present	Public Health Service - Retired

SCIENTIFIC ACTIVITIES

Grant Reviewer

NIH Developmental Biology Study Section, June, 1996; November, 1997; Permanent Member, 2001-2006.
Army Breast Cancer Molecular Biology Study Section, September, 1996
Army Breast Cancer Research Program, 1999, 2000
NIH Program Project Grants (5), 1999-2002
Leukemia Society Translational Research Committee, 1999-2004

Ad Hoc Grant Reviewer

1992-1993	National Science Foundation
1991-1992	Veterans Administration Merit Reviewer

Ad Hoc Journal Reviewer

1989-present	Blood
1989-present	Proceedings of the National Academy of Sciences
1989-present	Oncogene
1989-present	Human Gene Therapy
1989-present	Journal of Clinical Investigation
2003-present	Nature
2003-present	Nature Medicine
2003-present	Nature Immunology
2003-present	The New England Journal of Medicine
2003-present	Cell
2003-present	Cancer Cell

Chairman

2001	"Tumor Suppressor Genes" session American Society of Hematology Meeting
2004	"Stem Cells and Cancer" education session American Association for Cancer Research Meeting

Editorial Board

2000-2003	Cancer Gene Therapy
2008-present	Cell Stem Cell

Co-Organizer

1999	8th International Conference on Gene Therapy of Cancer
1999	41st Annual Meeting of the American Society of Hematology
2005	American Association for Cancer Research meeting
2006	American Association for Cancer Research meeting
2007	Keystone Cancer Stem Cells meeting

Organizer and founder

2007	Gordon Conference Stem Cells and Cancer meeting

E. Post-degree Honors and awards, including memberships in professional Societies

MEMBERSHIPS AND OFFICES

American Society of Hematology
American Society of Clinical Oncology
American Association for the Advancement of Science
Central Society for Clinical Research
American Society of Clinical Investigation
Southwest Oncology Group - Bone Marrow & Stem Cell Transplant Committee
American Association for Cancer Research
American Society of Gene Therapy

SCHOLARSHIPS AND HONORS

1996	Elected, American Society of Clinical Investigation
2003	Physician of the Year 2003, Detroit Business Weekly
2005	Elected, Association of American Physicians
2007-2008	The Ruth Sager Lecture (Boston Cancer Research Association)

GRANTS

Ongoing Research Support

Characterization of Breast Cancer Stem Cells
P.I.: Michael F. Clarke, M.D.
Agency: The Breast Cancer Research Foundation
Type: SPO #36622 Period: 10/01/2011-09/30/2014 $200,000 0.12 cal month

The purpose of this project is to develop prognostic markers for breast cancer.

Stanford University Cancer Center
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: P30 CA 124435-06 Period: 06/01/2010-05/31/2015 $11,708 0.60 cal mos
SPO#: 36168

Stanford University (SU) is applying to the National Cancer Institute (NCI) for three years of funding of a Cancer Center Support Grant (CCSG) and for designation as a Comprehensive Cancer Center on the basis of three years of preparation with generous intramural support. The membership of the Center consists of 260 faculty members representing four Schools at SU (Medicine, Engineering, Humanities and Sciences, and the Graduate School of Business), and the Northern California Cancer Center (NCCC) with whom SU has a formal affiliation agreement.

Identification of Cancer Stem Cell Therapeutic Targets
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: PO1 CA 139490-05 Period: 05/27/2009-04/30/2014 $316,466 2.4 cal mos
SPO# 43422

There are three major goals of this proposal. The first is to do a comprehensive genomic and epigenomic analysis of leukemic and solid tumor cancer stem cells. The second is to develop new methods to culture cancer stem cells. The third is to develop new therapeutics against leukemia and breast cancer stem cells.

Clinically-Relevant Regulatory Networks in the Lung Tumor Microenvironment
P.I.: Plevritis
Agency: NIH
Type: SPO#48893 Period: 09/01/2011-08/31/2016 $4,655 0.24 cal mos

The major goals of this project are to computationally derive and experimentally validate key mediators of Tumor microenvironment. These mediators will represent candidate drug targets for disruption the interaction between lung cancer cells and their microenvironment and improving treating outcomes associated with Lung cancer.

Cellular Hierarchy of ER-Breast Cancers in Different Ethnic Groups
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: UO1 CA154209-03 Period: 09/29/2010-07/31/2015 $341,147 1.2 cal mos
SPO# 49267

The major goals of this project are to compare the cellular hierarchies of ER-,PR-, ERB-B2- (triple negative) breast tumors of different ethnicities to the cell types found in normal breast epithelium. This knowledge may lead to new insights into the treatment of breast cancer.

Self-Renewal of Normal and Leukemic Stem Cells
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: R01 CA 100225-08 Period: 04/01/2003-11/30/2015 $164,443 0.6 calendar
SPO# 37537

The major goals of this project is to determine whether alteration of the expression of putative *bmi-1* downstream targets restores the ability of *bmi-1* deficient bone marrow cells to give rise to leukemia, and to identify the target cell(s) for *bmi-1* –dependent transformation.

Cellular and Molecular Characterization of ER+ Breast Cancer
P.I.: Michael F. Clarke, M.D.
Agency: DoD
Type: SPO#49502 Period: 06/01/2011-05/31/2016 $758,003 2.4 calendar

The goals of this grant are to compare the cellular hierarchies of ER-,PR-, ERB-B2- (triple negative) breast tumors of different ethnicities to the cell types found in normal breast epithelium of different ethnicities.

USP16 controls stem cell number: implications for Down Syndrome RB3-05066
P.I.: Michael F. Clarke, M.D.
Agency: CIRM
Type: SPO# 52441 Period: 08/01/11-07/31/14 $300,000 2.4 cal mos

The major goals of this project are 1) Analysis of the self-renewal potential of human Down Syndrome HSCs, and 2) Evaluate if USP16 works as a protective factor from cancer appearance.

Targeting Toll-Like Receptor Signaling for Prevention and Treatment of Breast Cancer
BC123235 BCRP Breast Cancer Research Program – Innovator Award
P.I.: Michael F. Clarke, M.D.
Agency: DoD
Type: SPO#110213 Period: 5/1/13 – 4/30/18 $349,376 1.8 cal mos

The major goal of this project is to determine whether inhibitors of the TLF pathway might be useful for breast cancer prevention and/or treatment

Center of Excellence for Stem Cell Genomics – CIP2
P.D.: Michael Snyder CIP Leaders: Steven Quake, Michael F. Clarke, M.D.
Agency: CIRM
Type: SPO# Period: 04/01/14 to 03/31/19 $6,722,641 0.6 cal mos

Systematically characterize the heterogeneous cell subpopulations within normal and pathological tissues of the human brain and pancreas, and determine the gene expression and epigenetic properties of each member of the organ lineage tree, from stem cells to terminally differentiated cells. Subsequently using this data, compare the stem cell differentiation hierarchy of normal tissues to that of the disease states to elucidate underlying mechanisms of pathogenesis, and to identify gene expression and epigenetic markers for premalignant or malignant stem cell contaminating cell products intended for patient clinical trials.

Pending Research Support

(Quake, Stephen)
Ultrasensitive epigenetic studies of primary tumors cell subpopulations
Agency: National Institutes of Health Period: 04/01/2014 - 03/31/2018 $466,261 1.2 cal mos
Type: SPO# 112043

(Clarke, Michael)
Characterization of cells with mutations in the field of a breast cancer
Agency: National Institutes of Health Period: 04/01/2014 - 03/31/2018 $480.000 1.2 cal mos
Type: SPO# 112074

Completed Research Support

Functional Analysis of the DLK1-GTL2 Imprinted Region is Breast Stem Cell Differentiation and Tumorigenesis
P.I.: Michael F. Clarke, M.D.
Agency: Susan G. Komen Breast Cancer Foundation
Type: SPO#48215 Period: 09/27/2010-09/26/2013 $60,000. 0.12 cal mos

The purpose of this project is to characterize the relevance of the DLK1-GTL2 region in mammary development and breast tumor formation

Molecular and Functional Characterization of Colon Tumor Cancer Stem Cells and Stroma
P.I.: Michael F. Clarke, M.D.
Agency: NIH/NCI
Type: U54 CA 126524 Period: 09/30/2006-08/31/2011 $528,116. 2.40 calendar
The major goal of this project is to understand the mechanisms by which cancer stem cells interact with the tumor stroma.

Stem Cells and Cancer
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Period: 07/01/2007 – 06/30/2008

The goal of this proposal is to extensively characterize breast cancer stem cells (BCSCs). In the first aim, we will use the principles of stem cell biology to determine whether a single solid tumor stem cell exists that has the ability to form a tumor and to regenerate a heterogeneous population of cancer cells. In the second aim we will develop an expanded gene expression analysis of BCSCs. This should allow us to refine to the BCSC derived gene signature that appears to be a powerful predictor of survival and risk of metastasis for women with early stage breast cancer. The gene expression analysis of BCSCs also serves as the foundation for aim 3. In this aim, we will begin to identify better markers that can be used to identify BCSCs. We hypothesize that these new markers will be useful for the identification of women that have increased risk for relapse of their disease.

Targeting PCD for Cancer Therapy
P.I.: Michael F. Clarke
Agency: NIH/NCI
Type: P01 CA75136 Period: 04/01/98 - 01/31/05
Project 3: Targeting PCD for Leukemia Treatment (Clarke, Project Leader)
Core B: Administrative Core (Clarke, Core Leader)

The major goals of this program project are: 1) to understand the perturbations in the programmed cell death (PCD) pathway in cancer cells; and, 2) to determine whether the differences between cancer cells and normal cells can be exploited to develop new therapeutic agents. To accomplish these goals, adenovirus vectors are being used to specifically inactivate inhibitory components of the PCD pathway. Cancers of the breast, ovarian, bladder and hematopoietic origin are being analyzed.

Identification and Characterization of Tumor-Initiating Breast Cancer Cells
P.I.: Michael F. Clarke, M.D.
Agency: Department of Defense—US Army
Type: BC021518 Period: 06/09/03 to 06/08/05

The major goals of this project are 1) to characterize the cancer stem cell phenotype of multiple tumors and establishment of a breast cancer xenograft tumor bank, and 2) to determine whether the stem cells from the primary tumor and a metastatic tumor obtained from the same patient vary phenotypically or functionally and 3) to determine whether the tumorigenic subpopulation varies with ER/Pg/R status of these tumors.

A Search for Genes that Regulate Stem Cells
P.I.: Michael F. Clarke, M.D.
Agency: NIH/NIDDK
Type: P01 DK53074 Period: 10/01/1997-05/31/2009 $115,668 0.60 calendar

The major goal of this project is to identify, clone, characterize, and place within a biological context genes expressed by stem cells that play direct roles in specifying the developmental properties of self renewal and differentiation and the decision between these two developmental options. The following projects make up this program. Project 1: Search for genes that regulate hematopoietic stem cells, PI: (Weissman) Project 2:

Polycomb and hematopoietic stem cell self-renewal pathway, PI: (Clarke) Project 3: Genomic and proteomic analysis of stem and progenitor cells, PI: (Hood) Project 4: Genes that control stem cell behavior, PI: (Fuller)

The Role of RGS18 in Mouse Hematopoiesis
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: R01 HL068831 Period: 04/01/2006-03/31/2009 $226,559 2.40 calendar

The major goals of this project are 1) to determine the biological function(s) of RGS18, and 2) to determine the mechanisms by which interferon-y regulates RGS18, and, 3) to further define the biochemical functions of RGS18.

Self Renewal of Normal and Leukemic Stem Cells
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: R01 CA100225 Period: 09/19/2006-07/31/2009 $529,597 3.00 calendar

The goals of this project are 1) to determine whether alteration of the expression of putative bmi-1 downstream targets restores the ability of bmi-1 deficient bone marrow cells to give rise to leukemia and 2) to identify the target cell(s) for bmi-1 dependent transformation.

Characterization of Breast Cancer Stem Cells
P.I.: Michael F. Clarke, M.D.
The Breast Cancer Research Foundation
Period: 10/01/2005-09/30/2009 $792,357 0.60 calendar

The purpose of this project is to further characterize breast cancer stem cells within tumors and to identify critical pathways that drive tumor formation and dissemination.

Analysis of Leukemia Cells
P.I.: Michael F. Clarke, M.D.
Agency: NIH
Type: R01 CA104987 Period: 06/22/2006-05/31/2009 $198,287 0.60 calendar

The goal of this grant is to begin to understand the similarities and differences of normal stem cells and tumorigenic cancer cells derived from patients with AML or solid tumors. The specific aims are #1: To determine whether a single tumorigenic cancer cell can generate the heterogeneous populations of tumorigenic and non-tumorigenic cancer cells, #2: To determine whether the proportion of tumorigenic cancer cells in a tumor changes during tumor growth, #3 To determine whether the phenotype of the tumorigenic cancer cells changes during passage in the xenograft mouse model, and #4 To identify the genomic makeup of tumorigenic cancer cells from multiple tumors and to determine whether tumorigenic solid tumor cancer cells and tumor-initiating leukemia cells share expression of “stem cell genes” with normal stem cells.

Stanford University Cancer Center
P.I.: Beverly S. Mitchell
Agency: NIH
Type: 3 P30 CA124435 Period: 06/04/07-05/31/10 0.60 calendar

Stanford University (SU) is applying to the National Cancer Institute (NCI) for three years of funding of a Cancer Center Support Grant (CCSG) and for designation as a Comprehensive Cancer Center on the basis of three years of preparation with generous intramural support. The membership of the Center consists of 260 faculty members representing four Schools at SU (Medicine, Engineering, Humanities and Sciences, and the Graduate School of Business), and the Northern California Cancer Center (NCCC) with whom SU has a formal affiliation agreement.

Procurement for Xenograft Tumors and Novel Antibodies to Detect Cancer Stem Cells and Stromal Cells
P.I.: Michael F. Clarke, M.D.
Agency: SAIC-Frederick, Inc.
Type: 28XS176 Period: 04/11/2008-05/29/2009 $525,289 (No Cost Extention) 0.12 calendar

The major goal of this project is to supply 25 human xenograft monoclonal antibodies for identification.

F. BIBLIOGRAPHY - LIST OF SCHOLARLY PUBLICATIONS

PEER REVIEWED PUBLICATIONS (TOTAL NUMBER: 106 PUBLISHED)

1. Ingraham LM, Weening RS, Clarke MF, Boxer LA and Baehner RL. Relationship of the respiratory burst and rachidonate metabolism during phagocytosis by guinea pig alveolar macrophages. J Lab Clin Med, 99:908-916, 1982.

2. Clarke MF, Gleman EP and Reitz MS, Jr.. Homology of human T-cell leukemia virus envelope gene with class I HLA gene. Nature, 305:60-62, 1983.

3. Clarke MF, Westin E, Schmidt D, Josephs SF, Ratner L., Wong-Staal F, Gallo RC and Reitz MS, Jr.. Transformation of NIH 3T3 cells by a human c-sis cDNA clone. Nature, 308:464-467, 1984.

4. Reitz MS, Mann D, Clarke MF, Kalyanaraman VS, Robert-Guroff M, Popovic M and Gallo RC. Presence of HTLV in a subset of T cells from an infected patient: some immunochemical properties of the infected cells. Hamatol Bluttransfus, 28:459-461, 1983.

5. Reitz MS Jr, Mann DL, Eiden M, Trainor CD and Clarke MF. DNA methylation and expression of HLA DR alpha. J Mol Cell Biol, 4:890-897, 1984.

6. Clarke MF, Trainor CD, Mann DL, Gallo R.C. and Reitz MS, Jr.. Methylation of human T-cell leukemia virus proviral DNA and viral RNA expression in short- and long-term cultures of infected cells. Virology, 135:97-104, 1984.

7. Josephs SF, Ratner L, Clarke MF, Westin, EH, Reitz, MS and Wong-Staal F. Transforming potential of human c-sis nucleotide sequences encoding platelet-derived growth factor. Science, 225:636-639, 1984.

8. Mann DL, Clark J, Clarke MF, Reitz MS, Jr., Papovic M, Francini G, Trainor CD, Strong DM, Blattner WA. and Gallo, RC. Identification of human T-cell lymphoma virus (HTLV) in B-cell lines established from patients with adult T-cell leukemia. JCI, 74:56-62, 1984.

9. Clarke MF, Fitzgerald P, Brubaker J. and Simpson, RT. Sequence-specific interaction of histones with the simian virus 40 enhancer region in vitro. J Biol Chem, 260:12394-12397, 1985.

10. Clarke MF, Mann, DL, Murray C and Reitz, MS. Differential methylation of class I histocompatability antigen genes in T-cell lines derived from two different types of T-cell malignancies. Leukemia Res, 8(6):965-973, 1984.

11. Okamoto T, Reitz, MS, Clarke MF, Jagodzinski LL and Wong-Staal F. Activation of a novel kpn I transcript by downstream integration of a human T-lymphotropic virus type I provirus. J Biol Chem, 261:4615-4619, 1986.

12. Clarke MF, Kukowska-Latallo JF, Westin E, Smith M and Prochownik EV. Constitutive expression of a c-myb cDNA blocks Friend murine erythroleukemia cell differentiation. Mol & Cell Biol, 8:884-892, 1988.

13. Adams S, Upadhyaya G, Clarke MF and Emerson SG. The proliferation of human leukemic cell line AML-193 is regulated by multiple hematopoietic growth factors and cytokines. Leukemia, 3:314-315, 1989.

14. Weber BL, Westin E and Clarke MF. Differentiation of mouse erythroleukemia cells enhanced by alternatively spliced c-myb mRNA. Science, 249:1291-1293, 1990.

15. Westin EW, Gorse K and Clarke MF. Alternative splicing of the human c-myb gene. Oncogene, 5 (8):1117-1124, 1990.

16. Caldwell, J, Locey B, Clarke MF, Emerson SG and Palsson, BO. The influence of culture conditions on genetically engineered NIH-3T3 cells. Biotech Prog, 7:1-8, 1991.

17. Emerson SG, Palsson BO and Clarke MF. The construction of high efficiency human bone marrow tissue ex vivo. J Cell Biochem, 45:268-272, 1991.

18. Schwartz RM, Emerson SG, Clarke MF and Palsson BO. In vitro myelopoiesis stimulated by rapid medium exchange and supplementation with hematopoietic growth factors. Blood, 78 (12):3155-3161, 1991.

19. Angelotti, TP, Clarke MF, Longino MA and Emerson SG. Biotinylated granulocyte/macrophage colony-stimulating factor analogs: effect of linkage chemistry on activity and binding. Bioconjugate Chemistry, 2 (6):466-474, 1991.

20. Varma A., El-Awar FY, Palsson BO, Emerson SG and Clarke MF. Can dexter cultures support stem cell proliferation? Experimental Hematology, 20:87-91, 1992.

21. Danish, R, El-Awar O, Langmore J, Weber B, Turka LA and Clarke MF. C-myb effects on kinetic events during MEL cell differentiation. Oncogene, 7:901-907, 1992.

22. MacArthur L, Clarke MF and Westin E. Malignant transformation of NIH 3T3 fibroblasts by human c-sis is dependent upon the level of oncogene expression. Molecular Carcinogenesis, 5:311-319, 1992.

23. Schwartz RM, Caldwell J, Clarke MF, Emerson SG and Palsson, B. The influence of extra-cellular matrix and stroma remodeling on the productivity of long term human bone marrow cultures. Cytotechnology, 10:217-224, 1992.

24. Ryan JJ, Danish R, Gottlieb CA and Clarke MF. Cell cycle analysis of p53 induced cell death in murine erythroleukemia cells. Mol & Cell Biol, 13:711-719, 1993.

25. Clarke MF, El-Awar F, Schwartz RM, Palsson, BO and Emerson, SG. Retroviral gene transfer into human hematopoietic cells using rapidly perfused long term bone marrow cultures. Cancer Bulletin, 45:153-158, 1993.

26. Ryan JJ and Clarke MF. Alteration of p53 conformation and induction of apoptosis in a murine erythroleukemia cell line by dimethylsulfoxide. Leukemia Research, 18:617-621, 1994.

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28. Sumantran V., Ealovega MW, Nunez G, Clarke MF and Wicha MW. Overexpression of Bcl-xS sensitizes MCF-7 cells to chemotherapy induced apoptosis. Cancer Research, 55:2507-2510, 1995.

29. Fukunaga N, Ryan JJ, Nunez G. and Clarke MF. Bcl-2 protects murine erythroleukemia cells from p53-dependent and -independent radiation-induced cell death. Carcinogenesis, 16:1761-1767, 1995.

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bcl-xs adenovirus selectively induces apoptosis in cancer cells, but not normal bone marrow cells. Proceedings of the National Academy of Sciences, 92:11024-11028, 1995.

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33. Schott AF, Apel IJ, Nuñez G. and Clarke MF. Bcl-xL protects cancer cells from p53-mediated apoptosis. Oncogene, 11:1389-1394, 1995.

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38. Han JS, Nuñez G., Wicha MW and Clarke MF. Targeting cancer cell death with a bcl-xs adenovirus. Springer Seminars in Immunopathology, 19:279-288, 1997.

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BOOK REVIEWS (NONE)

ABSTRACTS (SIX SELECTED; TOTAL = 14)

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6. Clarke MF. Stem Cells, Cancer and Self-Renewal Signals, American Society of Hematology Education Session, December 8, 2001.

INVITED PRESENTATIONS (MOST RECENT)

2008 "Self-Renewal and Cancer Stem Cells" City of Hope - Duarte, CA February 13, 2008

2008 "Regulation of Self-Renewal in Normal Stem Cells and Cancer" AACR/Advances in Cancer - Dead Sea, Jordan March 16-20, 2008

2008 "New Approaches to Cancer Prevention and Therapy" Johns Hopkins Medicine/The Sidney Kimmel Comprehensive Cancer Center/NCI/CCC - Baltimore, MD April 27-28, 2008

2008 "Self Renewal in Normal and Cancer Stem Cells" NCI/CCC/UCSF 2008 Symposium: Helen Diller Family Comprehensive Cancer Center - San Francisco, CA May 22-23, 2008

2008 "Self Renewal in Normal Stem Cells and Cancer" Evans Scholar Lecture, MGH Cancer Center/Harvard Medical School - Boston, MA June 17-20, 2008

2008 "What Can We Learn about Self Renewal and Cancer Therapy from the Prospective Isolation of Cancer Stem Cells?" 2008 National Cancer Research Institute of the UK Cancer Conference – Birmingham October 5-8, 2008

2008 "What Can We Learn About Cancer Self Renewal from the Prospective Identification of Cancer Stem Cells?" Ludwig Institute for Cancer Research,/Karolinska Institute, DBRM - Stockholm, Sweden September 25-27, 2008

2008 "What Can We Learn from the Prospective Isolation of Cancer Stem Cells?" Plenary Lecture - Nagoya, Japan October 28-30, 2008

2008 "Not all Cancers are Alike: Identifying the Cells that grow into Cancers, and What We Can Do about Them" The Breast Cancer Research Foundation Symposium and Awards Luncheon – New York, NY October 29, 2008

2008 "Epigenetic Regulation of Stem Cell Self-Renewal and Fate Decisions" Chairman Pan American Health Organization – Havana, Cuba November 10-14, 2008

2009 "Stem Cell Pathways and Cancer" Department of Hematology-Oncology & Abramson Family Cancer Research Institute at The University of Pennsylvania – Philadelphia, Pennsylvania January 06, 2009

2009 "Consequences of Utilization of Stem Cell Pathways by Cancer Cells" 22nd Annual International Symposium of the Hunter College Center for Study of Gene Structure & Function – New York January 21, 2009

2009 “Stem Cells in Malignant Epithelial Tumors” 9th Symposium of the Charles Brupbacher Foundation – Zurich February 13, 2009

2009 “Molecular Analysis of Normal and Malignant Epithelial Stem Cells” CNIO Cancer Conference – Madrid, Spain February 23, 2009

2009 “What Can We Learn from the Prospective Isolation of Cancer Stem Cells?” Cancéropôle CLARA – Archamps (Haute-Savoie), France March 24-25, 2009

2009 “Advances in Cancer Stem Cells” 2009 Annual Meeting of the American Association for Cancer Research – Denver, Colorado April 18-22, 2009

2009 “Stem Cell Signaling, Self Renewal and Cancer” Tulane University – New Orleans, Louisiana April 23, 2009

2009 “Stem Cells Pathways and Cancer” The University of Chicago Biomedical Sciences Cluster Committee on Cancer Biology and Breast Cancer Spore Seminar Series – Chicago, Illinois May 19-20, 2009

2009 “Molecular Regulators of Self Renewal in Normal Tissues and Cancer” University of Minnesota Cancer Center Seminar Series – Minneapolis, Minnesota June 15-16, 2009

2009 “Molecular Regulation of Self Renewal and Normal Stem Cell and Cancer” Society for Biomolecular Sciences, Boston, Massachusetts, September 2-3, 2009

2009 “Molecular Regulation of Stem Cell Self Renewal in Normal and Diseased Tissues” Gordon Research Conferences, Les Diablerets, Switzerland, September 13-18, 2009

2009 “Molecular Analysis of Normal and Malignant Epithelial Stem Cells” 7th International Symposium on Minimal Residual Cancer - Athens, Greece, September 16-19, 2009

2009 “Stem Cells and Cancer, Two Faces of Self Renewal” Pittsburgh University Seminar Series - Pittsburg, Pennsylvania, October 6, 2009

2009 “The Relevance of Stem Cells to the Prevention and Treatment of Breast Cancer” 2009 Breast Cancer Symposium - San Francisco, California, October 8-10, 2009

2009 “Stem Cells and Cancer, Two Faces of Self Renewal” Life Technologies 2009 Science and Technology Symposium - Skamania Lodge, Washington, October 11-14, 2009

2009 “Stem Cells and Cancer, Two Faces of Self Renewal” Josephine Nefkens Symposium - Rotterdam, The Netherlands, November 13, 2009

2010 “Overview of Cancer Stem Cells” Gynecologic Oncology Group – San Diego, California, January 28, 2010

2010 “Stem Cells and Cancer, Two Faces of Self Renewal” American Association for Cancer Research Conference – Arlington, Virginia, February 28 – March 2, 2010

2010 “Stem Cells and Cancer, Two Faces of Self Renewal” University of Texas Distinguished Lecturer Series – San Antonio, Texas April 5-7, 2010

2010 “Stem Cells and Cancer, Two Faces of Self Renewal” Stony Brook Cancer Symposium, New York, New York April 27, 2010

2010 “Stem Cells and Cancer, Two Faces of Self Renewal” Columbia University, New York, New York April 28, 2010

2010 "Regulation of Self Renewal by the Microenvironment in Normal Epithelial Stem Cells and Epithelial Cancer Cells or Stem Cells and Cancer, Two Faces" The Banbury Center, Cold Spring Harbor, New York May 5-7, 2010

2010 "Regulation of Mammary Stem Cells by MicroRNAs" 2010 GRC Mammary Gland Conference, Lucca (Barga), Italy June 6-11, 2010

2010 "Epigenetics and MicroRNAs in Cancer and Leukemia" Wilsede Meeting Heinrich-Pette-Institut – Wilsede, Germany June 19-23, 2010

2010 "Clinical Implications of Cancer Stem Cells" Molecular Radiotherapy Meeting – Toulouse, France June 24-25, 2010

2010 "Stem Cells and Cancer" Stem Cells: the diverging goals of regenerative medicine and oncology Meeting – Rome, Italy July 1-2, 2010

2010 "Cancer Stem Cells: Diagnostic, Prognostic, Theranostic and Therapeutic Implications" Beckman Coulter 2010 Science and Technology Symposium – Brea, California July 6-8, 2010

2010 "3rd International Conference on Stem Cells and Cancer" – Heidelberg, Germany October 3-5, 2010

2010 "ICC on Mouse Models of Cancer" – Barcelona, Spain October 7-8, 2010

2010 "UEGW Meeting" – Barcelona, Spain October 25-26, 2010

2010 "International Forum on Prospective Cancer Research" – Paris, France November 6, 2010

2010 "Singapore Cancer Meeting" – Singapore November 8-10, 2010

2010 "Frontiers in Biomedical Research Symposium" – Hong Kong November 30-December 5, 2010

2010 "33rd Annual Breast Cancer Symposium" – San Antonio, Texas December 9-11, 2010

2011 "Helene Harris Memorial Trust 12th International Forum on Ovarian Cancer – Miami Florida January 15-19, 2011

2011 "Keystone –Genomic Instability and DNA Repair" conference, Keystone Colorado, January 30-February 4, 2011

2011 "26th Nagoya International Cancer Treatment Symposium" – Nagoya, Japan February 10-12, 2011

2011 "2011 Molecular and Cellular Basis of Human Disease Symposium"-Cleveland, Ohio March 29, 2011

2011 "American Association for Cancer Research 102nd Annual Meeting" – Orlando, Florida April 2-4, 2011

2011 "Department of Biochemistry and Molecular Genetics Seminar" – Chicago, Illinois April 19-21, 2011

2011 "3rd Biennial International Collaborative Symposium" – Soul, Korea April 28-30, 2011

2011 "ISSCR" – Toronto, Canada May 14-17, 2011

2011 "111th Annual Congress of Japan Surgical Society" – Tokyo, Japan May 25-27, 2011

2011 "EOH Conference" – Orlando, Florida August 5, 2011

2011 "NBCC Summit on Prevention of Metastatic Breast Cancer" – Aspen, Colorado August 25-29, 2011

2011 "2011 Working Conference on Neoplastic Stem Cells" – Vienna, Austria August 31- September 5, 2011

2011 “AARC Special Conference in Breast Cancer Research” – San Francisco, California October 12-15, 2011

2011 “Seminar at MD Anderson Cancer Center” – Houston, Texas October 17-19, 2011

2011 “Scholar Lecture at University of North Carolina” - Chapel Hill, NC October 31- November 2, 2011

2012 “Scholar Lecture at University of Toronto” - Toronto, Canada January 18-20, 2012

2012 “AACR Annual Conference” – Chicago, Illinois March 31-April 2, 2012

2012 “Frontiers in Oncology Seminar”-University of Maryland, Baltimore MD, April 11-12, 2012

2012 “Keynote Symposium-Cancer Research”- University of Indiana, Indianapolis May 6-9, 2012

2012 “”First Symposium on Head, Neck and Cancer Stem Cells”-University of Michigan, Ann Arbor Michigan May 10-11, 2012

2012 “Breakthrough Breast Cancer Conference”-University of Manchester, UK May 15-18, 2012

2012 “Molecular and Translational Oncology workshop”-Sanibel, Florida May 18-20, 2012

2012 “H Foundation Basic Science Technology Symposium”-Northwestern University, Chicago Illinois June 6-8, 2012

2012 “Nobel Conference-Breast Cancer, Progress and Challenges in Prevention, Risk, Prediction, Tumor Biology and Treatment”-Karolinska Institute, Stockholm Sweden June 13-17, 2012

2012 “Stem Cell Perturbations in Downs Syndrome and Cancer “- Boston Massachusetts, September 13-18, 2012

2012 “ACTC: From Basic Research to Clinical Practice” – Athens, Greece September 26-29, 2012

2012 “4th Int’l Conference on Stem Cells and Cancer” – Heidelberg, Germany October 12-14, 2012

2012 “Biomed Conference” – Barcelona, Spain November 12-14, 2012

2012 “Cancer Stem Cell Meeting”-Fukuoka, Japan November 30-December 1, 2012

2013 “NIH Genetics Training Program – seminar” – University of Utah, Salt Lake City, January 7, 2013

2013 “Tumor Invasion and Metastasis”- AACR Conference, San Diego, January 20-23, 2013

2013 “SFB Symposium: "Control of Cell Motility in Development and Cancer" – Freiburg, Germany, February 20-22, 2013

2013 AACR Annual Meeting, Washington DC, April 6, 2013

2013 Eppley Cancer Center Grand Round – seminar, University of Nebraska, Omaha, NE, April 9, 2013

2013 7th International Meeting - Stem Cell Network NRW, Cologne, Germany, April 23-24, 2013

2013 4th Gordon Research Conference “Stem Cell and Cancer”, Les Diablerets, Switzerland, April 24-26, 2013

2013 Gordon Research Conference “Mucosal Health & Disease”, Stonehill College, Easton MA, June 9-14

2013 “Down Syndrome & cancer: the yin and yang of stem cell” – Lecture at Childrens Hospital, Boston, Massachusetts, September 5, 2013

2013 "Stem Cells in Normal tissue and disease" – Lecture at Methodist Cancer Center, Houston, TX, September 16, 2013

2013 "Ludwig Scientific Retreat", Oxford, UK, September 23-25, 2013

2013 "Int'l Symposium on Minimal Residual", Paris, France September 24-27, 2013

2013 "Annual Stem Cell Symposium", UC Berkeley's Student Society for Stem Cell Research, October 5, 2013

2013 "Evaluation and Development of Molecular Therapies for Cancer", University of Michigan, November 26, 2013

2014 "Cancercon 2014", Chennai Madras, India January 30 – February 2, 2014

2014 "Keystone Symposium: Stem Cells and Cancer" Banff, Alberta Canada, February 5-7, 2014

2014 "Regulation of Normal and Cancer Stem Cell senescence by USP16" San Diego, CA April 5-9, 2014

2014 "Down Syndrome and Cancer: the Ying and Yang of stem cells" Houston, Texas April 14-15, 2014

2014 "Molecular modulation of Cancer Stem Cells in Down syndrome" Bodrum, Turkey April 23-25, 2014

2014 "Molecular regulation of aging of normal and cancer stem cells" Heidelberg, Germany May 7-10, 2014

2014 "Downs Syndrome and Cancer: the Ying and Yang of stem cells" University of Michigan May 13-15, 2014

PATENTS

Methods for regulating the specific lineages of cells produced in a human hematopoietic cell culture, methods for assaying the effect of substances on lineage-specific cell production, and cell compositions produced by these cultures. Patent allowed November 7, 1994.

Method and compositions for the ex vivo replication of stem cells, for the optimization of hematopoietic progenitor cell cultures, and for increasing the metabolism, GM-CSF secretion and/or IL-6 secretion of human stromal cells. Patent allowed November 7, 1994.

Methods for human gene therapy, including methods and compositions for the ex vivo replication and stable genetic transformation of human stem cells, for the optimization of human hematopoietic progenitor cell cultures and stable genetic transformation thereof. Patent allowed November 7, 1994.

Methods for human gene therapy, including methods and compositions for the ex vivo replication and stable genetic transformation of human stem cells, for the optimization of human hematopoietic progenitor cell cultures and stable genetic transformation thereof, and for increasing the metabolism, GM-CSF secretion and/or IL-6 secretion of human stromal cells. Patent allowed March 21, 1995.

Methods of increasing rates of infection by directing motion of vectors. Patent allowed February 9, 1999.

Epithelial Cancer Stem Cells. Patent allowed 2005.

Targeting chromatin modifiers for the treatment of medical conditions. Patent pending.