

**Name** : Dr Lance David Miller, PhD  
**Appt** : Senior Group Leader, Genome Institute of Singapore  
**Tel** : (65) 64788100  
**Fax** : (65) 64789060  
**Email** : millerl@gis.a-star.edu.sg

### **Employment History**

April 2001 – present : **Senior Group Leader , Genome Institute of Singapore, Microarray and Expression Genomics Laboratory, Singapore,**

- established comprehensive microarray infrastructure to support GIS and collaborators in expression array technology from microarray manufacture to higher-order data analysis.
- Establishing research programs in cancer genomics and steroid/nonsteroid hormone signaling

January 1999 – April 2001 : **Staff Scientist, Facilities Director, National Cancer Institute, Division of Clinical Sciences, Department of Medicine, NCI Microarray Facility, Gaithersburg, MD**

- Managed all facility functions including microarray design and manufacture, clone acquisition and management, instrumentation acquisition and usage, technology development, policy implementation, and personnel structuring.
- Carried out array-based research in the field of signal transduction and worked closely with NCI/CIT informatics unit to construct a microarray database and develop analytical tools for higher order data analysis.
- Served as NCI-designated educator for comprehensive microarray procedures.

July 1997 - January 1999 : **CRTA Fellow, National Cancer Institute, Division of Clinical Sciences, Department of Medicine, Section of Molecular Signaling and Oncogenesis, Bethesda, MD,**

- Developed a platform for microarray technology at the NCI for the purpose of developing the infrastructure for a microarray facility for the Division of Clinical Sciences.
- Applied genomic approaches to the study of human disease and signal transduction pathways and designed and manufactured microarrays for basic and clinical applications.
- Served as primary instructor for comprehensive microarray techniques for NCI intramural research community and non-NCI collaborators.

September 1995 - June 1997 : **Graduate Student (PhD), Lineberger Comprehensive Cancer Center, Chapel Hill, NC,**

- Searched for the human Ectrodactyly locus using a cDNA capture and enrichment technique.
- Investigated the inhibitory potential of a minimal peptide that binds CAK (cyclin-dependent kinase activating kinase) and inhibits phosphorylation of CDK2.
- Characterized the molar range of inhibition of a GST-fusion protein derived from the Rak tyrosine kinase SH3 domain that inhibits the phosphotransferase activity of CDC2.

January 1995 - June 1995 : **ECU School of Medicine, Greenville, NC, Molecular Biology Laboratory Technician**

- Identified a novel thrombin mutation in an individual heterozygous for Dysprothrombinemia.
- Investigated familial screening strategies utilizing SSCP and heteroduplex analysis.
- Optimized PCR, cloning, and screening conditions for the study of the thrombin gene.

May 1994 - July 1994 : **Teaching Assistant, ECU Program in Molecular Biology, Greenville, NC,**

- Served as instructor for a General Biology lab for college juniors and seniors; major themes included basic principles of microbiology, genetics, and biochemistry.

January 1994 - March 1995 : **Graduate Student, (MS) ECU School of Medicine, Greenville, NC**

- Identified human thyroid hormone-regulated genes using differential display technology.
- Amplified and isolated cDNA using PCR and modern cloning strategies.
- Sequenced and characterized putative thyroid hormone-regulated genes.

November 1992 - August 1993 : **Microbiology Laboratory Technician, AMSCO Scientific, Apex, NC,**

- Tested the resistance of bacterial spores to various sterilization cycles.
- Determined spore populations of biological indicators and inoculums produced by AMSCO.
- Assisted in the manufacture of biological products and maintenance of production machinery.

### **Academic Qualifications**

#### **BS Degree (1988 – 1992), University of North Carolina at Chapel Hill**

- Biology, Minors - Marine Science and Chemistry, GPA 3.2.

#### **Master's degree (1993 – 1995), East Carolina University**

- Program in Molecular Biology

- Molecular Biology / Biotechnology, GPA 4.0.

#### **PhD degree (1995 –2001), University of North Carolina at Chapel Hill**

- Curriculum in Genetics and Molecular Biology

- Genetics and Molecular Biology

### **Publications**

**Miller LD**, Smeds J, George J, Vega VB, Vergara L, Ploner A, Pawitan Y, Hall P, Klaar S, Liu ET and Bergh J. An expression signature for p53 status in human breast cancer predicts mutation status, transcriptional effects and patient survival. *Accepted by PNAS July 22, 2005.*

Smeds J, **Miller LD**, Bjohle J, Hall P, Klaar S, Liu ET, Pawitan Y, Ploner A, Bergh J. Gene profile and response to treatment. *Ann Oncol.* 2005;16 Suppl 2:ii195-202.

Xu XQ, Emerald BS, Goh EL, Kannan N, **Miller LD**, Gluckman PD, Liu ET, Lobie PE. Gene expression profiling to identify oncogenic determinants of autocrine human growth hormone (hGH) in human mammary carcinoma. *J Biol Chem.* 2005 Jun 24;280(25):23987-4003.

Ploner A, **Miller LD**, Hall P, Bergh J, Pawitan Y. Correlation test to assess low-level processing of high-density oligonucleotide microarray data. *BMC Bioinformatics.* 2005 Mar 31;6(1):80.

George J, Sung W-K, Lee W-H, Vega VB, and **Miller LD**. Information theoretic approach for microarray based pathogen detection. *Proceedings of the 6th WSEAS International Conference on Mathematics and Computers in Biology and Chemistry*, Feb 2005.

Peng X, Murthy Karuturi RK, **Miller LD**, Lin K, Jia Y, Kondu P, Wang L, Wong LS, Liu ET, Balasubramanian MK, Liu J. Identification of Cell Cycle-regulated Genes in Fission Yeast. *Mol Biol Cell.* 2005 Mar;16(3):1026-42.

**Miller LD** & Liu ET. Expression Profiling and Breast Cancer Biology. *In Press in Breast Disease.*

Chin-Yo Lin, Anders Strom, Vinsensius Berlian Vega, Say Li Kong, Ai Li Yeo, Jane S Thomsen, Wan Ching Chan, Balraj Doray, Dhinoth K Bangarusamy, Adaikalavan Ramasamy, Liza A Vergara, Suisheng Tang, Allen Chong, Vladimir B Bajic, **Lance D Miller**, Jan-Ake Gustafsson, Edison T Liu. Discovery of estrogen receptor alpha target genes and response elements in breast tumor cells. *Genome Biol.* 2004;5(9):R66.

Vega VB, Bangarusamy DK, **Miller LD**, Liu ET, Lin CY. BEARR: Batch Extraction and Analysis of cis-Regulatory Regions. *Nucleic Acids Res.* 2004 Jul 1;32:W257-60.

Lin K, Liu J, **Miller L**, Wong, L. Genome-Wide cDNA Oligo Probe Design and Its Applications in *Schizosaccharomyces Pombe*. Chapter 15, The Practical Bioinformatician. Ed: Limsoon Wong. World Scientific Publishing Co. Pte. Ltd., Singapore, 2004.

**Miller LD**, McPhie P, Suzuki H, Kato Y, Liu ET and Cheng S-Y. Multi-tissue gene expression analysis in a mouse model of thyroid hormone resistance. *Genome Biol.*, 2004 Apr;5(5):R31.

Lim PL, Kurup A, Gopalakrishna G, Chan KP, Wong CW, Ng LC, Se-Thoe SY, Oon L, Bai X, Stanton LW, Ruan Y, **Miller LD**, Vega VB, James L, Ooi PL, Kai CS, Olsen SJ, Ang B, Leo YS. Laboratory-acquired severe acute respiratory syndrome. *N Engl J Med.* 2004 Apr 22;350(17):1740-5.

Wong CW, Albert TJ, Vega VB, Norton JE, Cutler DJ, Richmond TA, Stanton LW, Liu ET and **Miller LD**. Tracking the Evolution of the SARS Coronavirus Using High-throughput, High density Resequencing Arrays. *Genome Res.* 2004 Mar;14:398-405.

Khadijah S, Neo SY, Hossain MS, **Miller LD**, Mathavan S, and Kwang J. Identification of white spot syndrome virus latency-related genes in specific-pathogen-free shrimps by use of a microarray. *J. Virology* 2003 Sept;77(18):00.

Mir AA, Myakishev MV, Polesskaya OO, Moitra J, Petersen D, **Miller L**, Orosz A, Vinson C. A search for candidate genes for lipodystrophy, obesity and diabetes via gene expression analysis of A-ZIP/F-1 mice. *Genomics.* 2003 Apr;81(4):378-90.

Reinhold WC, Kouros-Mehr H, Kohn KW, Maunakea AK, Lababidi S, Roschke A, Stover K, Alexander J, Pantazis P, **Miller L**, Liu E, Kirsch IR, Urasaki Y, Pommier Y, Weinstein JN. Apoptotic susceptibility of cancer cells selected for camptothecin resistance: gene expression profiling, functional analysis, and molecular interaction mapping. *Cancer Res.* 2003 Mar 1;63(5):1000-11.

**Miller LD**, Long PM, Wong L, Mukherjee S, McShane LM and Liu ET. Optimal gene expression analysis by microarrays. *Cancer Cell.* 2002 Nov;2(5):353-61.

Obermiller LE, Coon KD, Hayden JM, **Miller LD**, Zhang W, Pattengill J and Reaven PD. Microarray analysis of 7-ketocholesterol induced monocyte differentiation. (*Submitted to Physiological Genomics August, 2002*).

Wang E, **Miller LD**, Ohnmacht GA, Mocellin S, Perez-Diez A, Petersen D, Zhao Y, Simon R, Powell JI, Asaki E, Alexander HR, Duray PH, Herlyn M, Restifo NP, Liu ET, Rosenberg SA and Marincola FM. Prospective molecular profiling of melanoma metastases suggests classifiers of immune responsiveness. *Cancer Res.* 2002 Jul 1;62(13):3581-6.

Panelli MC, Wang E, Phan G, Puhlmann M, **Miller L**, Ohnmacht GA, Klein HG, and Marincola FM. Gene-expression profiling of the response of peripheral blood mononuclear cells and melanoma metastases to systemic IL-2 administration. *Genome Biology.* 2002 June 25;3(7):1-17.

Zhou Y, Gwadry FG, Reinhold WC, **Miller LD**, Smith LH, Scherf U, Liu ET, Kohn KW, Pommier Y and Weinstein JN. Transcriptional regulation of mitotic genes by camptothecin-induced DNA damage: Microarray analysis of dose- and time-dependent effects. *Cancer Res.* 2002 Mar;62(6):1688-95.

**Miller LD**, Park KS, Guo QM, Alkharouf NW, Malek RL, Lee NH, Liu ET and Cheng SY. Silencing of Wnt signaling and activation of multiple metabolic pathways in response to thyroid hormone-stimulated cell proliferation. *Mol Cell Biol.* 2001 Oct;21(19):6626-39.

Lee T, **Miller LD**, Gubin AN, Makhlof F, Wojda U, Barrett AJ, Liu ET and Miller JL. Transcriptional patterning of uncoupled proliferation and differentiation in myelodysplastic bone marrow with erythroid focused arrays. *Blood.* 2001 Sep 15;98(6):1914-21.

Nees M, Geoghegan JM, Hyman T, Frank S, **Miller LD** and Woodworth CD. Papillomavirus type 16 oncogenes downregulate expression of interferon-responsive genes and upregulate proliferation-associated and NF-kappaB-responsive genes in cervical keratinocytes. *J Virol.* 2001 May;75(9):4283-4296.

\*Wang E, \***Miller LD**, Ohnmacht GA, Liu ET and Marincola FM. High fidelity mRNA amplification for gene profiling. *Nature Biotechnology.* 2000 April;18(4):457-9.

\* *co-first authors*

Henriksen, R.A., Dunham, C.K., **Miller, L.D.**, Casey, J.T., Menke, J.B, Knupp, C.L., and Usala, S.J. Prothrombin Greenville, Arg517-->Gln, Identified in an Individual Heterozygous for Dysprothrombinemia. *Blood.* Vol. 91, No. 6, 1998.

### **Invited Talks**

“Resolving the Molecular Basis of Clinical Heterogeneity in Breast Cancer Through Integrative and Predictive Biology” The “State-of-the-Art Lecture. The 3<sup>rd</sup> World Congress of Nephrology, Singapore, June 26-30, 2005.

“From Oncogenic Mechanisms to Patient Prognosis Through Gene Expression Profiling” Plenary Lecture. Frontiers in Cancer Research: a BMRC-SCS Symposium, Biopolis, Singapore, May 24-25, 2005.

“A Gene Expression Signature for p53 Functional Status in Human Breast Tumors is Prognostic of Patient Outcome” The 96<sup>th</sup> Annual Meeting of the AACR (American Association for Cancer Research), Anaheim, California, USA, April 16-20, 2005.

“Blood, Sweat & Microarrays – The Real Deal: A GIS Microarray Workshop” The 5<sup>th</sup> HUGO Pacific Meeting & 6<sup>th</sup> Asia Pacific Conference on Human Genetics, Biopolis, Singapore, November 17-20, 2004.

“A p53 Expression Signature in Human Breast Cancer Predicts Patient Outcome” The 5<sup>th</sup> HUGO Pacific Meeting & 6<sup>th</sup> Asia Pacific Conference on Human Genetics, Biopolis, Singapore, November 17-20, 2004.

“A Gene Expression Signature for p53 Functional Status in Human Breast Tumours” National Healthcare Group (NHG) Annual Scientific Congress 2004, Raffles City Convention Center, Singapore, October 9-10, 2004.

“Biochemical Pathways and Outcome Prediction in Human Breast Cancer” 4th National Microarray/AMATA Conference, Freemantle, WA, Australia, September 30, 2004.

“Exploring the Oncogenome using DNA Microarray Technology” New Horizons of Medical Science: Advanced Technologies in Functional Genomics Conference, Catholic University, Seoul, South Korea, May 6, 2004.

“Emergent Biology through Integration and Mining of Microarray Datasets” Statistical Methods in Microarray Analysis, National University of Singapore, Singapore, January 7-31, 2004.

“Transcription and its Regulation” 12th Congress of the ASEAN Federation of Endocrine Societies (AFES) & 7th Congress of Asia & Oceania Thyroid Association (AOTA), Singapore, November 30-December 4, 2003

“DNA Microarray Technology and its Biological and Clinical Applications” *Guest Speaker*, Nanyang Polytechnic Bioinformatics Workshop, Nanyang Polytechnic Campus, Singapore, January 20-24, 2003.

“Expression Genomics in Cancer.” 4<sup>th</sup> HUGO Pacific Meeting & 5<sup>th</sup> Asia-Pacific Conference on Human Genetics, Pattaya, Chonburi, Thailand, October 27-30, 2002.

“Towards the Unification of Microarray Platforms.” 5<sup>th</sup> Microarray Gene Expression Data Society Meeting, Tokyo, Japan, September 24-27, 2002.

“On the Technology Front: From Oligo Arrays to Promoter Mining.” The Australian Cancer Research Foundation’s ‘2<sup>nd</sup> Australian Microarray Meeting,’ South Stradbroke Island, Queensland, Australia, July 24-26, 2002.

“Uncovering Structure in Gene Expression Data.” Language of DNA Workshop, Institute for Mathematical Sciences Post-Genome Knowledge Discovery Symposium, Singapore, February 18, 2002.

“An Overview of Microarray Applications, Infrastructure, and Goals at the GIS.” 1st Annual Singapore Microarray Meeting 2002, National Cancer Centre, Singapore, January 26, 2002.

“Establishing an Effective Platform for Microarray Technology in the Genomics Era.” DNA Nanotechnology Conference, Howard University, Washington D.C., October 20, 2000.

“Deciphering Signaling Circuitry and Biological Phenomena through Genomic Monitoring.” *Guest Speaker*, The Norwegian Radiumhospital, Tumorbiologisk Avdeling, Oslo, Norway, August 16-23, 2000.

“Gene Expression Profiling in Clinical Diagnostics.” National Institute of Nursing Research, Summer Genetics Institute Seminar Series, Gaithersburg, MD, June 14, 2000.

“cDNA Microarrays: From Production to Investigator Training.” Mouse Models of Human Cancer Consortium, Monterey, CA, January 19-21, 2000.

“Tapping Into Array Technology at the NCI.” IBC's *Chips To Hits '99* Conference, Berkeley, CA, November 2-5, 1999.

“Constructing a Microarray Facility from the Ground Up: the Key Components.” Cold Spring Harbor Laboratories course on Microarray Technology, Cold Spring Harbor, NY, October 27-28, 1999.

“Gene Expression Profiling Using cDNA Microarrays” Technology Workshop on Genomic Microarrays sponsored by Cartesian Technologies and GSI Lumonics, Arlington, VA, June 15-16, 1999.

“Expression Arrays in the Study of Mammary Biology.” 15th Biennial Gordon Research Conference on Mammary Gland Biology - Microarray Workshop, Henniker, NH, June 6-11, 1999.

“Dissecting the Biological Activity of Flavopiridol at the Genomic Level.” *Guest Speaker*, NIDCR Seminar Series, Bethesda, MD, May 26, 1999.

“NCI Array Facility; Where We Are And What Are The Problems.” NCI Seminar Series, Bethesda, MD, August 19, 1998.

### **Academic Lectures**

“The Use of Microarrays in Cancer Research” Guest Lecturer, Singapore-MIT Alliance: SMA5422 Special Topics in Biotechnology, National University of Singapore, Singapore, January 14, 2005.

“Transcriptomics: DNA Microarrays and Biomedical Applications” *Guest Lecturer*, IMCB/NUS Genomics Lecture Series, Institute of Molecular and Cell Biology, Singapore, August 20, 2004.

“DNA Microarray Technology and Clinical Decision Making” *Guest Lecturer*, Singapore-MIT Alliance: Molecular Engineering of Biological and Chemical Systems, National University of Singapore, Singapore, February 17, 2004.

“Introduction to DNA Microarray Technology and its Impact on Biomedical Research” *Guest Lecturer*, National University of Singapore, Advanced Genetics and Genome Sciences course, Singapore, February 17, 2004.

“Transcriptomics: DNA Microarrays and the Biology of the Genome.” *Guest Lecturer*, IMCB/NUS Genomics Lecture Series, Institute of Molecular and Cell Biology, Singapore, August 7, 2002.

**Journal/Grant Reviews/ Assessments:**

2002 : Nucleic Acids Research

2003 : BMC Cancer, BMRC Grant Reviews

2004 : Journal of Biology, Genome Biology, BMRC Grant Reviews

2005 : Cancer Cell, Genome Biology, Australian National Health and Medical Research Council (NHMRC) Grant Review