

ASSOCIATE RESEARCH SCIENTIST/RESEARCH SCIENTIST

Profile

Xianyong Ma, MSc., Ph.D.

(MSc.: Radiation Chemistry, Ph.D.: Biochemistry)

Expertise:

Cancer Biology; Molecular Biology; Epigenetics and Epigenomics; Genetics and Genomics; Protein Science; Pathway Analysis; Long non-coding RNAs; NGS and Bioinformatics Analysis; Radiation Chemistry.

Key Qualifications:

- Protein Science (lysate preparation): Prepare cell lysates from cultured cells and tissues (mouse and human tissues); prepare extractions of cytoplasm, nuclear soluble fraction and chromatin; Prepare bone marrow cells for FACS sorting and gene expression analysis. Protein Science (Protein Identification):
- SDS-PAGE separation and Western blot, Immunoprecipitation; Mass/Spec measurement to identify AA sequence of target protein/peptides; Expression of target proteins using different vectors/cell lines to identify the biological functions of target genes.
- Protein Science (Imaging Techniques): Imaging the Western Blot using Blot Imaging System or regular ECL film and Developer solution; Confocal fluorescence microscopic technique; High Resolution Live Cell Imaging system to record cell growth and proliferation.

General Qualifications:

- Cancer Biology: 16 years of research experience covers nasopharyngeal carcinoma, gynecological cancer (endometrial stromal sarcoma and epithelial ovarian cancer) and megakaryoblastic leukemia (MKL);
- 3 years of research experience in hematopoiesis (Molecular hematopoiesis);
- Skilled global profiling of gene expression and regulation: including CHIP-sequencing, Microarray, High-throughput biological data analysis including the annotation of regulatory sequences of genomic DNA, the expression analysis with TopHat and Cufflinks program;
- Strong gene/genetic editing skills including site-directed mutagenesis, CRISPR/Cas9 techniques;
- Strong ability to identify, implement new technologies. Motivated to learn from environment including colleagues or team members;
- Good record of experimental data with notebook format and electronic documentation.

Accomplishments

- More than 30 peer reviewed articles with the total impact factors bigger than 56;
- Three competitive grants reception as PI or key personnel;
- International and national grants review, manuscripts review;

Professional Experience

Associate Research Scientist/Research Scientist 05/2004 to 01/2017 Bio-Rad Laboratories Ohio, IL

Molecular Mechanisms of Carcinogenesis/Metastasis of Tumors:

My major interesting and research career focuses on cancer projects. During my Ph.D. thesis study, I investigated the transform function of EB virus protein LMP (latent membrane protein), I established LMP transgenic mice via microinjection of purified DNA fragments into pronuclei of fertilized mouse eggs. By analysis of the development of LMP transgenic mice we identified the squamous cell carcinoma in intestine and stomach organs. These works led to several articles published on SCI-cited Journal (See resume). The most cancer research experience of mine was from the exploration of molecular mechanisms for endometrial cancer and ovarian cancer, which are the two major gynecologic cancers. My study for endometrial cancer (endometrial stromal sarcoma, ESS) was under the mentorship of Prof. Jeffrey Sklar, I firstly identified the presence of JAZF1-SUZ12 fusion protein in ESS cancer cells, furthermore I have studied the biochemical function of this fusion protein and identified its oncogenic feature, which the fusion protein activates downstream oncogene expression via decomposition of polycomb repressive complex 2 (PRC2), therefore abolishes its repression role on target chromatin. Further investigations for JAZF1-SUZ12 role in ESS carcinogenesis uncovered the WNT/APC/beta-catenin signaling pathway is highly activated. The abnormal activation of WNT/APC/beta-catenin signaling cascade in women's ESS shed light on understanding carcinogenesis/metastasis of this type of malignancy. Articles have been published for these studies on the journal including: *Oncotarget* 2016, *AJCP* 2014: 3:1-9, *AJMB* 2014: 4:134-149, *Cell Cycle*, 2009, 8:218-222, *PNAS*, 2007, 104:20001-20006). My study for ovarian cancer focuses on the 6mA DNA modification and EOC carcinogenesis under the mentorship of Dr. Mor. 6mA (6-methyladenosine) is a novel DNA methylation, which remains unknown in human ovarian cancer cells even in other human cells, our research firstly identified the 6mA existence both in DNA and RNA of ovarian cancer cells, and high level of 6mA modification on DNA facilitates stemness status of epithelial ovarian cancer (EOC) cells, a model of "Writer-Reader-Eraser" of 6mA modification in regulation of target gene expression is being established. On the mRNA level 6mA modification control the molecule's metabolism and degradation of modified mRNA, our data showed that the mRNA of ovarian tumor cells have high level of 6mA methylation on global scale. This high level modification represents a large number of mRNAs rapidly degrade to become waste without through translation procedure and production of biological function. Some key repression genes of chromatin activation (SUZ12, Ski family members etc.) have been involved in these degradation procedure. These findings will be published soon.

lncRNA Research Experience:

My experience on lncRNA research is focused on the biological function of long non-coding RNA Malat1 (Metastasis-Associated Lung Adenocarcinoma Transcript 1). I systematically analyzed how Malat1 regulates gene expression and protein function, and put forward a new model that lncRNA molecules regulate target gene expression and protein function via multiple layer and flexible manner (*AJPLM*, 2014). I also explored the physiological function of Malat1 in hematopoiesis. I firstly proved that Malat1 plays a positive role in regulating proliferation and

maintaining undifferentiated status of early-stage hematopoietic cells. This study revealed Malat1 has important function to block differentiation in early stage hematopoietic stem cells and progenitor cells. This study shed a light on exploring the therapeutic significance to inhibit the proliferation potential of malignant cells (**BMC genomics** , 2015, 16: 676-686).

Associate Research Scientist 01/2000 to 04/2004 Duke University Zebulon , NC

Molecular Hematopoiesis and MKL Leukemia:

In the Department of Laboratory Medicine and Pathology of Yale, I used mouse hematopoietic cDNA library to subtract 10,000 random known genes, therefore enriched hematopoietic genes and established two new subtracted libraries (EEE, LRH). In this study I determined 1255 distinct genes, of which 622 are named genes, 386 match uncharacterized ESTs, and 247 are novel. The expression patterns of some new identified genes in EML (Erythroid myeloid lymphoid progenitors) cells were tested. This critical work helps to identify key genes that are involved in the generation of blood cells from their precursor cells (**Blood** , 2002, 100:833-844). After this work, I switched to address the specific genes that involve in hematopoietic/myeloid and MKL leukemia. I determined that RBM15 (RNA binding motif 15) protein inhibits myeloid differentiation in hematopoietic stem cells/ progenitor cells via Notch mediating signaling pathway (**MCB** , 2007, 27: 3056-3064). Furthermore I analyzed the biological function of SPOC structure domain, which is a conserved sequence of Mint family members. Our studies revealed that this domain is a critical domain on induction of hematopoietic differentiation both in embryonic stem cells and hematopoietic progenitor cells (**AJMB** , 2012, 2: 304-317).

Associate Research Scientist 01/2000 to 12/2015 Yale University City , STATE

Large scale gene sequencing and Genomics/Epigenomics:

I established multiple myeloid- specific cDNA libraries, and sequenced around 2,200 ESTs using 96-well format plates via Sanger sequencing. I also finished three CHIP-seq projects using NGS sequencing (Illumina), and one CHIP-seq project NGS sequencing for determine 6md/ modification using single molecule/real time sequencing (SMRTM) technique. During my genome-wide studies, I analyzed high-throughput data using ChIPpeakAnno to annotate CHIP-seq data of DNA; using Basespace, TopHat and Cufflinks to analyze the RNA seq data. (**Blood** , 2002, 100:833-844). (two manuscripts are under preparation).

Postdoctoral Associate 10/1997 to 12/1999 Yale University City , STATE

Molecular Biology–Interferon Induced Proteins and the Biological Function:

In the Department of Molecular Biophysics and Biochemistry, I studied the p202a protein, which is one of the members of interferon-gamma induced protein family. My work proved p202a protein represses nuclear factor NF-kappa B through inhibiting the binding activity of heterodimer p50/p65 to target DNA and enhancing the binding activity of p50 homodimer to target DNA, therefore activates the gene expression of TGFβ signaling pathway and induces apoptosis (**JBC** , 2003, 278: 23008-23019)

Education and Training

Ph.D : Biochemistry 1996 Xiangya Medical School, Central South University City Biochemistry

MSc : Radiation Chemistry 1992 Shanghai Institute of Nuclear Research (SINR), Chinese Academy of Sciences City Radiation Chemistry

Biology 1986 Hunan Normal University City Biology

Affiliations

- Member of the American Society for Biochemistry and Molecular Biology (ASBMB);
- Associate Member of American Society of Hematology (ASH).

Personal Information

Personal Data:

Name: Ma, Xianrong

Date of Birth: March 16,

Status: Permanent Residence of USA

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Address: 1703 Litchfield TPKE, Woodbridge, CT 06525, USA;

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Tel: 203-9078908 (C), 203-3973099(H)

Email: xianrong.ma316@gmail.com

Publications

Peer Reviewed Articles:

- **Ma, X.Y.,** Alvero, A; Tedja, R; et al. N6-Methyldeoxyadenosine (6mdA) Preserves Stemness Status and Reduce Proliferation Rate In Human Ovarian Cancer Cells (In preparation).
- **Ma, X.Y.,** Wang, J. L., Wang, J.H., et al. Aberrant Activation of WNT/APC Signaling Pathway is Involved in the Initiation and Progression of Human Endometrial Stromal Sarcoma (In preparation).
- **Ma, X.Y.,** Wang, J.L., Wang, J.H., et al. JAZF1 Increases the Cholesterol and Lipid Catabolism via Activation of Rate-Limitation Enzyme CYP7A1 Expression in Mice (Submitted).
- **Ma, X.Y.,** Wang, J, L., Wang, J.H. et al. (2017) The JAZF1-SUZ12 fusion protein disrupts PRC2 complexes and impairs chromatin repression during human endometrial stromal tumorigenesis. *Oncotarget*. 8(3): 4062-4078. DOI: 10.18632/oncotarget.13270.
- **Ma, X.Y.,** Tang J., Wang, J. L., et al. Dysfunction of Polycomb Repressive Complex2 (PRC2) Promotes the Tumorigenesis of Human

Endometrial Stromal (ESS) through Activation of WNT11 Signaling Pathway. *Journal of Biotechnology & Biomaterials* 5(2): 38. Â

- Gao, Y.F., Tang, T., Sun, L.L., Gao, X.B., **Ma, X.Y.**, et al. (2015) "Downregulation of the Muscadomestica Peptidoglycan Recognition Protein SC (PGRP-SC) Leads to Over-activation of Imd Pathway and Tardy Pupation" *Molecular Immunology* 68:65-74. Doi: 10.1016/j.molimm. 2015.08.007. Â
- **Ma, X.Y.**, Ma, X. C., Cai, Q. et al. (2014) "Long Non-Coding RNA Malat1 Regulates Gene Expression and Protein Function via Multiple-Layer and Flexible Manners." *Austin Journal of Pathology and Laboratory Medicine*. 1(3), 1-5. Â
- **Ma, X.Y.**, Gao, X. B. (2014) "Epigenetic Modifications and Carcinogenesis of Human Endometrial Cancer." *Austin Journal of Clinical Pathology*.3: 1-9. Â vÂ Ma, X.Y., Ma, X. C., Wang, J.H. (2014) "Endometrial Carcinogenesis and Molecular Signaling Pathways." *American Journal of Molecular Biology*.4, 134-149. DOI: 10.4236/ajmb.2014.43015 Â
- **Ma, X.Y.**, Wang L., Jie Tang, et al (2012). "SPOC Domain of Mint Protein Induces Hematopoietic Differentiation via BMP4/Smad5 pathway." *American Journal of Molecular Biology*.2 (4) 304-317. DOI: 10.4236/ajmb. 2012.24032 Â
- **Ma, X.Y.**, Renda M.J.; Wang L. et al. (2007). "Rbml 5 Modulates Notch-Induced Transcriptional Activation and Affects Myeloid Differentiation." *Mol. Cell. Biol.* 27, 3056-3064. DOI:10.1128/MCB.01339-06 Â
- Li, H., **Ma, X.Y.**, Wang, J.L., et al (2007). "Rearrangements and Allelic Expression of the JAZ1/Suz12 Gene: Effects on Cell Proliferation, Apoptosis, and Tumor Progression in Endometrial Stromal Tumors" *Proc. Natl. Acad. Sci. USA* 104, 20001-20006. DOI:10.1073/pnas.0709986104Â
- Li, H., Wang, J.L., **Ma, X.Y.**, et al (2009). "Gene fusions and RNA trans-splicing in normal and neoplastic human cells" *Cell Cycle* 8, 218-222.Â Â DOI: 10.4161/cc.8.2.7358 Â
- **Ma, X.Y.**, Wang, H., Ding B. et al. (2003) "The interferon-inducible p202a protein modulates NF-kappa B activity by inhibiting the binding to DNA of p50/p65 heterodimers, while enhancing the binding of p50 homodimers" *J. Biol. Chem.* 278, 23008-23019. DOI: 10.1074/jbc.M302105200 Â
- **Ma, X.Y.**, Husain T., Peng Hui., et al.(2002). "Development of a murine hematopoietic progenitor complementary DNA microarray using a subtracted complementary DNA library." *Blood*.100, 833-844. DOI: dx.doi.org /10.1182/blood.V100.3.833 Â
- Wang, H., Ding, B., Liu C.J., **Ma, X.Y.**, et al. (2002). "The Increase in the levels of the interferon-inducible proteins p202a, p202b and RNA-dependent protein kinase (PKR) during myeloblast Differentiation is due to Transactivation by MyoD. The Tissue Distribution in uninfected Mice Does not Depend on Interferons." *J. Interferon Cytokine Res.* 22, 729-737. doi:10.1089/10799900260100231. Â
- Wang, H., Liu C.J., Lu, Y.B., Chatterjee, G., **Ma, X.Y.** et al. (2000), "The Interferon- and differentiation-inducible p202a protein inhibits the transcriptional activity of c-Myc by blocking its association with Max." *J. Biol. Chem.* 275, 27377-27385.Â DOI 10.1074/jbc.M003409200 Â
- **Ma, X.Y.**, Yao, K.T., Lu, G.X., et al. (1999). "Epstein-Barr virus Oncogene BNLF-1 Induces Gastrointestinal Cancer in Transgenic Mice." *Pathogenesis*. 2, 188-195. Yang,
- X.J., Pu, P.Y., Yao, K.T. **Ma X.Y.**, and et al. (1999) "Study on suicide gene therapy of malignant glioma." *Chinese Journal of Tumor Clinic.* 26, 405-408.Â
- **Ma, X.Y.**, Yao, K.T. (1998), "Cloning of the Epstein Barr Virus Gene BNLF-1 and Its Expression in PA317 cells." *Acta Biochimica et Biophysica Sinica* 30: 81-85. PMID: 12174303
- **Ma, X.Y.**, Yao, S.D., Wang, W.F. et al. (1998), "Study on Transient Products Induced by Pulse Radiolysis of Cytosine Aqueous Solution Saturated with N2O." *Journal of Chemical Physics* 11: 130-133. Â Â
- Liu, J., Qi, Z.H., Jian, Z. F., Cao, P., Chen, F.P., **Ma X.Y.** (1998), "Bcl-2 mRNA expression in acute promyelocytic leukemia detected by RT-PCR." *Bulletin of Hunan Medical University* 30: 503-504.Â
- **Ma, X.Y.**, and Yao, K.T., (1997): Progress in the study of Molecular Biology for BNLF-1 Oncogene of EB virus. *Progress in Biochemistry and Biophysics* 24, 409-414.Â
- **Ma X.Y.**, Yao, S.D., Wang, W. F. et al. (1997): "Study on Transient Products Induced by Pulse Radiolysis of Cytosine Aqueous Solutions" *Acta Physico-Chimica Sinica*.13:833-837. Â
- **Ma, X.Y.**, Tang, J., Lin, N.Y. (1997): ESR of Spin Trapped Radicals by Hydryl Radical Separated with Sep-pakC18 in Aqueous Solution of Cytosine.Â *Acta Biophysica Sinica* 13,833-837.Â
- **Ma, X.Y.** Tang, J. (1997): Study on Cleavage Mechanisms of Dimmer (t-Bu) 2NO in Several Solvents Phases. *Spectroscopy and Spectral Analysis*. 17, 124-127.Â
- **Ma, X.Y.**, Yao, K.T (1997): The Application of Transgenic Technique to The Study of Structure and Function of Oncogene. *Foreign*

- Zhu, H.C, Zen, Q.H, Gu H.H, **Ma X.Y.** (1997): Two nitrosopiperazine-induced malignant transformation of nasopharyngeal epithelial cells of transgenic mice. Chinese Journal of Pathophysiology 6, 598-602.
- Zhu, H.C, Xiao, Z.Q. **Ma, X.Y.** (1996). Transfection of LMP gene of EB virus into Y-2 cells using electroporation. Bulletin of Hunan Medical University, 21(5):459-462.
- **Ma, X.Y.**, Yao, K.T. (1996). Novel, Highly Efficient and Rapid Method for Small-Scale Preparation of Plasmid DNA. China Journal of Modern Medicine 6, 8-10.
- **Ma X.Y.**, Yao, K. T. (1996). An Analysis of Development and Death of Founder Transgenic Mice of EBV Oncogene BNLF-1. Bulletin of Hunan Medical University, 21:5-8.
- **Ma, X.Y.**, Cao, Y., Yao, K.T. (1996), Progress in Techniques of Homologous Recombination. Biotechnology Progress, 16:16-23.
- **Ma, X.Y.**, Liu, W., Lu G.X., et al. (1995): Establishment of Transgenic Mice of EB Virus Oncogene BNLF-1. Advances in Life Science. Published by China Press for Science and Technology (Beijing) 1995, p740-745.
- Luo J., Wang, W.F., **Ma, X.Y.**, et al. (1993): A Novel Achievement of Pulse Radiolysis of Cytosine Aqueous Solution. Chinese Science Bulletin. 38:1-5
- **Ma, X.Y.**, Yao, K.T. (1992), Advances in the Technique of Retroviral Vector Mediated Gene Transfer. Foreign Medical Sciences-Molecular Biology Section, 15:170-173.
- **Ma, X.Y.**, Liu, R. Z (1987), Study on Superoxide Dismutase Isoenzyme for Old Patients of Coronary Heart Disease. Natural Science Journal of Jishou University, 10: 98-102.

IAEA-INIS (International Atomic Energy Agency's International Nuclear Information System) collection/high lights:

- **Ma Xianrong**; Yao Side; Zhang Jiashan; Lin Nianyun (1991). "Electron adduct of cytosine and its protonation products". Ref. No.: 25027475, INIS, 25(9): 5
- Luo Jian; Wang Wenfeng; **Ma Xianrong**; Yao Side; Zhang Jiashan; Lin Nianyun (1992). "Electron adduct of cytosine and its protonation. A novel achievement", Ref. Number 29061680, INIS, 29(49): 31

Conference publications

- **Ma, X.Y.**, Tang J., Wang, J. L., et al. "Dysfunction of Polycomb Repressive Complex2 (PRC2) Promotes the Tumorigenesis of Human Endometrial Stromal (ESS) through Activation of WNT11 Signaling Pathway". (Oral) August 2015. Orlando, USA. Proceedings of 9th Biotechnology Congress, Journal of Biotechnology & Biomaterials 5(2): 38.
- **Ma, X.Y.**, Tang J., Wang, J. L., et al. "Genome-wide Mapping of H3K27 Methylation Caused by Mutation of PcG2 Using CHIP-Sequencing Strategy". Proceedings of Chromatin Structure & Function conference. 2007. P137. Barbuda, Antigua and Barbuda.
- **Ma, X.Y.**, Li, H, Wang, J. L., et al. "Suz12 is a Key Component for Stabilization of Ezh2 and EED Protein of Polycomb Group 2 (PcG2) in Chromatin Compaction and Remodeling". Proceedings of Chromatin Structure & Function conference. 2006. P128. Punta Cana, Dominican Republic.
- **Ma, X.Y.**, Perkins, A.S, Krause, D, S., "A Novel Cofactor SHARP2 Promotes Myeloid Differentiation by Transcriptional Activation of Retinoic Response Elements". American Society of Hematology 44th annual meeting (2002). Blood, Vol 100, No.11,
- **Ma, X.Y.**, Degar, B., Wang, L, Krause, D. S., et al. "Gene Expression Patterns in Primary and Cultured Bone Marrow Cells". American Society of Hematology 43rd annual meeting (2001). Blood, Volume 98, No.11,
- **Ma, X.Y.**, Perkins, A.S., Diane, S.K., "Changes in Nuclear Regulator Mint Gene Expression During Myeloid Differentiation". American Society of Hematology 42nd annual meeting (2000). Blood, Volume 96, No.11,
- Grove, J., Wei, B., **Ma, X.Y.**, et al. "Jagged2 expression on murine and human hematopoietic stem cells and is down regulated with differentiation". American Society of Hematology 42nd annual meeting (2000). Blood, Volume 96, No.11,
- **Ma, X.Y.**, Husain, T., Lin, S., Perkins, A.S. et al. "Development of myeloid-specific microarray gene chips". Potential applications in the understanding of gene expression in hematopoietic stem cell differentiation. Proceedings of GSRS conference. 2000. p63. New Haven, USA.
- Yao, K.T., **Ma, X.Y.**, "Development of Gastrointestinal Cancers in Transgenic Mice Bearing the BNLF-1 Oncogene of Epstein-Barr Virus". Proceedings of 3rd Hong Kong International Cancer Congress and 7th International EBV Symposium (Hong Kong), 1996, p49.
- **Ma, X.Y.**, and Yao, K.T., "Experiment Study on Transgenic Mice of Epstein-Barr Virus Oncogene BNLF-1". Proceedings of the

Book Writing

Xianyong Ma, â€œ Microsurface Modifications of Gene Chips, Sample preparation and Hybridizationâ€ inÂ â€œGene Analysis and BioChip Techniqueâ€ , Hubei Academic Press, 2004, P255-295

Xianyong Ma, â€œGene Expression and Regulation of Tumorigenesisâ€ in Oncologyâ€, Hunan Medical University Press (Changsha), 1994, P68-P84.

References:

Gil G Mor: Professor of Obstetrics, Gynecology, and Reproductive Sciences; Division Director, Reproductive Sciences; Director Reproductive Immunology Unit and Discovery to Cure Program; Editor in Chief, AJRI Tel:Â 203-7856294,Â Email: gil.mor@yale.edu Â

Jeffrey L. Sklar: Professor of Pathology and of Laboratory Medicine; Director of Molecular and Genomic Pathology; Director of Molecular Diagnostics, Yale University School of Medicine. Tel: 2037856836 (O), Email: jeffrey.sklar@yale.edu Â

Diane S Krause: Professor of Laboratory Medicine and of Cell Biology; Director, Advanced Cell Therapy Laboratory, Yale University School of Medicine. Tel: 2037371678 (O), Email: diane.krause@yale.edu Â

Interests

- Molecular Mechanisms of Cancer Promotion and Metastasis;
- Novel Diagnosis Strategies and Bio-markers of Malignant Tumors;
- Signaling Pathway Analysis and Precision Medicine;
- Bio industrial Including Protein Expression and Purification, NGS Sequencing/Gene Profiling;
- Scientific Management.

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Skills

Skills:

1. Design and Performance Gene Edition, Gene Engineering;

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2. Protein Expression, Purification and Identification including Western Blot, Elisa; HPLC, Mass/Spec;

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3. Gene Expression Profiling and Gene Regulatory Element Annotation;

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4. Cell Culture and Stable Cell lines, Transform Cell Identification and Carcinogenicity analysis, Cell Growth/Apoptosis Analysis;

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5. DNA/RNA analysis techniques;

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6. Mouse Model and Animal Study;

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7. Computer Skill including Microsoft software, TopHat/Cuflinks, Gene Annotation and Clustering analysis and etc.

Additional Information

Other Experience and Professional Service:

02,2016: Epigenetic grant review: of â€œGestational Diabetes, the epigenome and health of the next generationâ€ for â€œDiABETES UK.

08,2015:(August -September): Co-Chair of Cancer Biology Session: 9th American Biotechnology Congress, August 31-September 2, 2015, Orlando, Florida, USA.

01,2013-12,2015: Paper review for Journals: BJMMR, AJMB, JBC and etc.

07,1996-09,1997: Associate Director, Associate Professor, Laboratory of Tumor Molecular Laboratory, Central South University, Changsha.

09,1991-07,1996: Scientific secretary, the Cancer Institute, Central South University, Changsha.

Honors and Awards:

2005: (February-May): Guest professor, Jishou University, Hunan, P.R. China.

12, 2002: Travel award: The American Society of Hematology, (Philadelphia, Pennsylvania).

05,1997: The award for top ten outstanding youths (Central South University, Changsha).

12,1997: Excellent paper second prize of natural sciences of Hunan Province (Changsha).

05,1996: Excellent Ph.D. thesis award by Central South University.Â

05,1995: Excellent Paper Prize of Chinese Association for Science and Technology (CAST), (Beijing, andÂ Â received by President Jiang Ze-ming)

12,1991: Excellent thesis award by Chinese Academy of Sciences.

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