

CURRICULUM VITAE

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Prof. Kuo is dedicate to the research of tumor progression for more than 20 years in Taiwan. His early works including discovery of the roles of IL-6 and CTGF in cancer metastasis and angiogenesis, leading to diagnostic platform and inhibitors development. His group also identify COX-2 as a lymphangiogenic regulator and thus promote metastasis. Recently, he also identified VEGF-C/Flt-4 axis to participate in cancer metastasis. Prof. Kuo was one of the few scientists who focus on the studies of evaluating roles of CTGF and VEGF-C/VEGF-R3 in cancers. His mechanistical studies about CTGF and VEGF-C/VEGF-R3 also give rise to a serial discoveries of novel tumor suppressors and oncogenes. Contactin-1, a GPI-anchored cell adhesion molecule, was found to be a downstream effector of VEGF-C and to promote invasion and metastasis of lung adenocarcinoma. Naa10p, an N-acetyltransferase, was identified from CTGF-indeuced hypoxia related genes and subsequently evaluated to be a metastasis suppressor. These outstanding researches of Prof. Kuo not only provide novel insights into the underlying mechanisms but also lead to development of novel therapeutic strategies.

Degree:

1980-1984	B.A., Institute of Food Science, Catholic Fu-Jen University
1984-1985	M.S., Institute of Biochemistry, National Taiwan University
1985-1989	Ph.D., Institute of Biochemistry, National Taiwan University
1989-1990	Postdoctoral Fellow, Institute of Biomedicine Science, academic Sinica

Research and Professional Positions Held in Chronological Sequence**I. Academic Appointments**

1991-1993	Lecturer, Institute of Toxicology College of Medicine National Taiwan University.
1993-1999	Associate Professor, Institute of Toxicology College of Medicine National Taiwan University
1999-2005	Professor and Director, Institute of Toxicology College of Medicine National Taiwan University
2005-2006	Professor, Institute of Toxicology College of Medicine National Taiwan University
2006-2007	M.D., Department of Molecular Oncology MD Anderson Cancer Center
2007-2009	Distinguished Professor Associated Dean, Director of R&D, Institute of Toxicology College of Medicine National Taiwan University
2009-2012	Director General, Department of Life Sciences, National Science Council Republic of China
2012 - Present	Co-hiring Professor, Graduate Institute of Toxicology, National Taiwan University College of Medicine
2012 - Present	Professor, Institute of Biochemical Science, National Taiwan University College of Life Science
2012 - Present	Director, Institute of fishery Biology, National Taiwan University College of Life Science
2012 - Present	Dean, National Taiwan University College of Life Science

II. Professional Affiliations

- 1991- Present Chinese Toxicology Society
- 1993- Present Society for Oncology Medicine
- 1995 -Present American Association for Cancer Research

III. Research Interests

1. Molecular mechanisms of oncogenes and tumor suppressors on the important processes of tumor development, including tumorigenesis, metastasis, angiogenesis and drug-resistance.
2. miRNAs and their important roles in cancer.
3. Cancer stem cells and their roles in regulating tumor development.
4. Molecular targeting and drug screening.

IV. Awards and Honors

1. Outstanding Academic Research Award, Recognized by of the National Science Council. (2000-2001 ; 2001-2004).
2. Outstanding Academic Research Award, Recognized by Chinese Oncology Societ (2000)
3. Dr. Tsungmin Tu Memorial Award, Recognized by Formosa Medical Association(2004)
4. Outstanding Merit and High Scholastic Achievement to Medical and Pharmaceutical Research Award, Recognized by Wang Ming-Ning Memorial Foundation (2004).
5. Outstanding Professor Award, Recognized by Far Eastern YZ Hsu Science and Technology Memorial Foundation (2005).
6. Ministry of Education 11th National Professorships and 51th Academic Awards, Recognized by Ministry of Education Department (2008).

Publication (2007-2012)

1. Chu CY, Cha ST, Chang CC, Hsiao CH, Tan CT, Lu YC, Jee SH, Kuo ML*. Involvement of matrix metalloproteinase-13 in stromal-cell-derived factor 1 alpha-directed invasion of human basal cell carcinoma cells. *Oncogene*. 2007 Apr 12;26(17):2491-501.
2. Su JL, Yen CJ, Chen PS, Chuang SE, Hong CC, Kuo IH, Chen HY, Hung MC, Kuo ML*. The role of the VEGF-C/VEGFR-3 axis in cancer progression. *Br J Cancer*. 2007 Feb 26;96(4):541-5.
3. Lin MT, Lin BR, Chang CC, Chu CY, Su HJ, Chen ST, Jeng YM, Kuo ML*. IL-6 induces AGS gastric cancer cell invasion via activation of the c-Src/RhoA/ROCK signaling pathway. *Int J Cancer*. 2007 Jun 15;120(12):2600-8.
4. Su JL, Yang CY, Zhao M, Kuo ML, Yen ML. Forkhead proteins are critical for bone morphogenetic protein-2 regulation and anti-tumor activity of resveratrol. *J Biol Chem*. 2007 Jul 6;282(27):19385-98.
5. Chen PS, Wang MY, Wu SN, Su JL, Hong CC, Chuang SE, Chen MW, Hua KT, Wu YL, Cha ST, Babu MS, Chen CN, Lee PH, Chang KJ, Kuo ML*. CTGF enhances the motility of breast cancer cells via an integrin-alpha5beta3-ERK1/2- dependent S100A4-upregulated pathway. *J Cell Sci*. 2007 Jun 15;120(Pt 12):2053-65.
6. Lin MT, Chang CC, Lin BR, Yang HY, Chu CY, Wu MH, Kuo ML*. Elevated expression of Cyr61 enhances peritoneal dissemination of gastric cancer cells through integrin alpha2beta1. *J Biol Chem*. 2007 Nov 23;282(47):34594-604.
7. Lin BR, Chang CC, Chen LR, Wu MH, Wang MY, Kuo IH, Chu CY, Chang KJ, Lee PH, Chen WJ, Kuo ML, Lin MT. Cysteine-rich 61 (CCN1) enhances chemotactic migration, transendothelial cell migration, and intravasation by concomitantly up-regulating chemokine receptor 1 and 2. *Mol Cancer Res*. 2007 Nov;5(11):1111-23.
8. Ho PY, Hsu SP, Liang YC, Kuo ML, Ho YS, Lee WS. Inhibition of the ERK phosphorylation plays a role in terbinafine-induced p21 up-regulation and DNA synthesis inhibition in human vascular endothelial cells. *Toxicol Appl Pharmacol*. 2008 May 15;229(1):86-93.
9. Cherng YG, Chang HC, Lin YL, Kuo ML, Chiu WT, Chen RM. Apoptotic insults to human chondrocytes induced by sodium nitroprusside are involved in sequential events, including cytoskeletal remodeling, phosphorylation of mitogen-activated protein kinase kinase-1/c-Jun N-terminal kinase, and Bax-mitochondria- mediated caspase activation. *J Orthop Res*. 2008 Jul;26(7):1018-26.
10. Lin MT, Kuo IH, Chang CC, Chu CY, Chen HY, Lin BR, Sureshbabu M, Shih HJ, Kuo ML*. Involvement of hypoxia-inducing factor-1alpha-dependent plasminogen activator inhibitor-1 up-regulation in Cyr61/CCN1-induced gastric cancer cell invasion. *J Biol Chem*. 2008 Jun 6;283(23):15807-15.
11. Tan CT, Chu CY, Lu YC, Chang CC, Lin BR, Wu HH, Liu HL, Cha ST, Prakash E, Ko JY, Kuo ML*. CXCL12/CXCR4 promotes laryngeal and hypopharyngeal squamous cell carcinoma.

metastasis through MMP-13-dependent invasion via the ERK1/2/AP-1 pathway. *Carcinogenesis*. 2008 Aug;29(8):1519-27.

12. Su JL, Chen PS, Chien MH, Chen PB, Chen YH, Lai CC, Hung MC, **Kuo ML***. Further evidence for expression and function of the VEGF-C/VEGFR-3 axis in cancer cells. *Cancer Cell*. 2008 Jun;13(6):557-60.
13. Chu CY, Chang CC, Prakash E, **Kuo ML***. Connective tissue growth factor (CTGF) and cancer progression. *J Biomed Sci*. 2008 Nov;15(6):675-85.
14. Gao M, Yeh PY, Lu YS, Chang WC, **Kuo ML**, Cheng AL. NF-kappaB p50 promotes tumor cell invasion through negative regulation of invasion suppressor gene CRMP-1 in human lung adenocarcinoma cells. *Biochem Biophys Res Commun*. 2008 Nov 14;376(2):283-7.
15. Shen CH, Chen HY, Lin MS, Li FY, Chang CC, **Kuo ML**, Settleman J, Chen RH. Breast tumor kinase phosphorylates p190RhoGAP to regulate rho and ras and promote breast carcinoma growth, migration, and invasion. *Cancer Res*. 2008 Oct 1;68(19):7779-87.
16. Tjiu JW, Chen JS, Shun CT, Lin SJ, Liao YH, Chu CY, Tsai TF, Chiu HC, Dai YS, Inoue H, Yang PC, **Kuo ML**, Jee SH. Tumor-associated macrophage-induced invasion and angiogenesis of human basal cell carcinoma cells by cyclooxygenase-2 induction. *J Invest Dermatol*. 2009 Apr;129(4):1016-25.
17. Chu CY, Cha ST, Lin WC, Lu PH, Tan CT, Chang CC, Lin BR, Jee SH, **Kuo ML***. Stromal cell-derived factor-1alpha (SDF-1alpha/CXCL12)-enhanced angiogenesis of human basal cell carcinoma cells involves ERK1/2-NF-kappaB/interleukin-6 pathway. *Carcinogenesis*. 2009 Feb;30(2):205-13.
18. Gao M, Yeh PY, Lu YS, Hsu CH, Chen KF, Lee WC, Feng WC, Chen CS, **Kuo ML**, Cheng AL. OSU-03012, a novel celecoxib derivative, induces reactive oxygen species-related autophagy in hepatocellular carcinoma. *Cancer Res*. 2008 Nov 15;68(22):9348-57.
19. Chen CN, Chang CC, Su TE, Hsu WM, Jeng YM, Ho MC, Hsieh FJ, Lee PH, **Kuo ML**, Lee H, Chang KJ. Identification of calreticulin as a prognosis marker and angiogenic regulator in human gastric cancer. *Ann Surg Oncol*. 2009 Feb;16(2):524-33.
20. Wang MY, Chen PS, Prakash E, Hsu HC, Huang HY, Lin MT, Chang KJ, **Kuo ML***. Connective tissue growth factor confers drug resistance in breast cancer through concomitant up-regulation of Bcl-xL and cIAP1. *Cancer Res*. 2009 Apr 15;69(8):3482-91.
21. Yeh TS, Wu CW, Hsu KW, Liao WJ, Yang MC, Li AF, Wang AM, **Kuo ML**, Chi CW. The activated Notch1 signal pathway is associated with gastric cancer progression through cyclooxygenase-2. *Cancer Res*. 2009 Jun 15;69(12):5039-48.
22. Yu CC, Hsu MJ, **Kuo ML**, Chen RF, Chen MC, Bai KJ, Yu MC, Chen BC, Lin CH. Thrombin-induced connective tissue growth factor expression in human lung fibroblasts requires the ASK1/JNK/AP-1 pathway. *J Immunol*. 2009 Jun 15;182(12):7916-27.
23. Chen YT, Furushima K, Hou PS, Ku AT, Deng JM, Jang CW, Fang H, Adams HP, **Kuo ML**, Ho HN, Chien CL, Behringer RR. PiggyBac transposon-mediated, reversible gene transfer in human

- embryonic stem cells. *Stem Cells Dev.* 2010 Jun;19(6):763-71.
24. Chien MH, Ku CC, Johansson G, Chen MW, Hsiao M, Su JL, Inoue H, Hua KT, Wei LH, **Kuo ML***. Vascular endothelial growth factor-C (VEGF-C) promotes angiogenesis by induction of COX-2 in leukemic cells via the VEGF-R3/JNK/AP-1 pathway. *Carcinogenesis.* 2009 Dec;30(12):2005-13.
 25. Hsu KW, Hsieh RH, Wu CW, Chi CW, Lee YH, **Kuo ML**, Wu KJ, Yeh TS. MBP-1 suppresses growth and metastasis of gastric cancer cells through COX-2. *Mol Biol Cell.* 2009 Dec;20(24):5127-37.
 26. Chen CH, Chien MH, **Kuo ML**, Chou CT, Lai JJ, Lin SF, Thummanagoti S, Sun CM. Diversity-oriented synthesis of angular bis-benzimidazole derivatives under microwave irradiation. *J Comb Chem.* 2009 Nov-Dec;11(6):1038-46.
 27. Cha ST, Chen PS, Johansson G, Chu CY, Wang MY, Jeng YM, Yu SL, Chen JS, Chang KJ, Jee SH, Tan CT, Lin MT, **Kuo ML***. MicroRNA-519c suppresses hypoxia-inducible factor-1alpha expression and tumor angiogenesis. *Cancer Res.* 2010 Apr 1;70(7):2675-85.
 28. Ueng TH, Chang YL, Tsai YY, Su JL, Chan PK, Shih JY, Lee YC, Ma YC, **Kuo ML***. Potential roles of fibroblast growth factor-9 in the benzo(a)pyrene-induced invasion in vitro and the metastasis of human lung adenocarcinoma. *Arch Toxicol.* 2010 Aug;84(8):651-60.
 29. Su JL, Chiou J, Tang CH, Zhao M, Tsai CH, Chen PS, Chang YW, Chien MH, Peng CY, Hsiao M, **Kuo ML**, Yen ML. CYR61 regulates BMP-2-dependent osteoblast differentiation through the $\alpha_3\beta_3$ integrin/integrin-linked kinase/ERK pathway. *J Biol Chem.* 2010 Oct 8;285(41):31325-36.
 30. Chen MW, Hua KT, Kao HJ, Chi CC, Wei LH, Johansson G, Shiah SG, Chen PS, Jeng YM, Cheng TY, Lai TC, Chang JS, Jan YH, Chien MH, Yang CJ, Huang MS, Hsiao M, **Kuo ML***. H3K9 histone methyltransferase G9a promotes lung cancer invasion and metastasis by silencing the cell adhesion molecule Ep-CAM. *Cancer Res.* 2010 Oct 15;70(20):7830-40.
 31. Lo CW, Chen MW, Hsiao M, Wang S, Chen CA, Hsiao SM, Chang JS, Lai TC, Rose-John S, **Kuo ML**, Wei LH. IL-6 trans-signaling in formation and progression of malignant ascites in ovarian cancer. *Cancer Res.* 2011 Jan 15;71(2):424-34.
 32. Hua KT, Tan CT, Johansson G, Lee JM, Yang PW, Lu HY, Chen CK, Su JL, Chen PB, Wu YL, Chi CC, Kao HJ, Shih HJ, Chen MW, Chien MH, Chen PS, Lee WJ, Cheng TY, Rosenberger G, Chai CY, Yang CJ, Huang MS, Lai TC, Chou TY, Hsiao M, **Kuo ML***. N- α -acetyltransferase 10 protein suppresses cancer cell metastasis by binding PIX proteins and inhibiting Cdc42/Rac1 activity. *Cancer Cell.* 2011 Feb 15;19(2):218-31.
 33. Yen ML, Hou CH, Peng KY, Tseng PC, Jiang SS, Shun CT, Chen YC, **Kuo ML***. Efficient Derivation & Concise Gene Expression Profiling of Human Embryonic Stem Cell-Derived Mesenchymal Progenitors (EMPs). *Cell Transplant.* 2011 Mar 7. doi: 10.3727/096368910X564067.

34. Lin BR, Chang CC, Chen RJ, Jeng YM, Liang JT, Lee PH, Chang KJ, **Kuo ML***. Connective tissue growth factor acts as a therapeutic agent and predictor for peritoneal carcinomatosis of colorectal cancer. *Clin Cancer Res.* 2011 May 15;17(10):3077-88.
35. Tseng PC, Hou SM, Chen RJ, Peng HW, Hsieh CF, **Kuo ML**, Yen ML. Resveratrol promotes osteogenesis of human mesenchymal stem cells by up-regulating RUNX2 gene expression via SIRT1/FOXO3A axis. *J Bone Miner Res.* 2011 Jun 28. doi: 10.1002/jbmr.460.
36. Pan SH, Chao YC, Hung PF, Chen HY, Yang SC, Chang YL, Wu CT, Chang CC, Wang WL, Chan WK, Wu YY, Che TF, Wang LK, Lin CY, Lee YC, **Kuo ML**, Lee CH, Chen JJ, Hong TM, Yang PC. The ability of LCRMP-1 to promote cancer invasion by enhancing filopodia formation is antagonized by CRMP-1. *J Clin Invest.* 2011 Aug 1;121(8):3189-205.
37. Chen PS, Su JL, Cha ST, Tarn WY, Wang MY, Hsu HC, Lin MT, Chu CY, Hua KT, Chen CN, Kuo TC, Chang KJ, Hsiao M, Chang YW, Chen JS, Yang PC, **Kuo ML***. miR-107 promotes tumor progression by targeting the let-7 microRNA in mice and humans. *J Clin Invest.* 2011 Sep 1;121(9):3442-55.
38. Chen SC, Shih CM, Tseng GC, Cheng WE, Chiou J, Hsiao M, **Kuo ML**, Su JL, Chen CY. Vascular Endothelial Growth Factor C as a Predictor of Early Recurrence and Poor Prognosis of Resected Stage I Non-small Cell Lung Cancer. *Ann Acad Med Singapore.* 2011 Jul;40(7):319-6.