BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Chung-Ho Chang, Ph.D.	Investigator/Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Chung-Yuan University	B.S.	1973	Physics
National Taiwan University	M.S.	1976	Solid State Physics
University of Illinois, Urbana, IL, USA	Ph.D.	1985	Biophysics
Stanford University, CA, USA	Post. Doc.	1988	Pharmacology and Cell Biology

Professional Appointment

2009-present Director, The Core Instrument Center, National Health Research Institutes

2009-2010 Acting Director, Department of Administration, National Health Research Institutes

2006-present Investigator, Institute of Cellular and System Medicine, National Health Research Institutes, Zhunan, Miaoli, Taiwan

2005-2006 Professor, Institute of Medical Research, Chang Jung Christian University, Changhua, Taiwan.

1999-2005 Associate Professor, Department of Medicine, Case Western Reserve University, Cleveland, OH, USA

1991-1999 Assistant Professor, Department of Medicine and Physiology and Biophysics, Case Western Reserve University, Cleveland, OH, USA

1988-1991 Visiting Assistant Professor, Department of Medicine and Physiology and Biophysics, Case Western Reserve University, Cleveland, OH, USA

1985-1988 Postdoctoral Fellow, Department of Pharmacology and Cell Biology, Stanford University, CA, USA

Other Research and Administrative Experience

2014-2015 Coordinator for the age-related diseases research group (老化相關疾病研究群) at the Institute of Cellular and System Medicine, National

Health Research Institutes.

2014-2015 NHRI 資本門小組委員

2014-2015 NHRI 成本分析及效益評估委員會工作小組組員

2010-present 中國醫藥大學老化醫學博士學位學程- NHRI 部分執行委員會召集人，及招生委員會、教務委員會及學生事務委員會主席

2014-present 支援國家環境醫學研究所-高醫環境職業醫學博士學位學程課程(規劃分子醫學技術與儀器分析課程及提供實習場所)。

Professional Service

Journal Reviewer:

1) Photochemistry and Photobiology
2) Journal of Membrane Biology
3) Archives of Biochemistry and Biophysics
4) Hypertension
5) Journal of Physiology
6) Nutrition, Metabolism and Cardiovascular Disease
7) American Journal of Physiology: Renal Physiology
8) Pharmacological Research
9) Molecular Nutrition and Food Research
10) Evidence-Based Complementary and Alternative Medicine
11) Cell Biochemistry and Biophysics
12) PLoS ONE
13) FEBS Journal
14) Journal of Clinical and Laboratory Investigation Updates

Grant Reviewer:

1) National Institute of Health (USA)
2) National Science Foundation (USA)
3) American Heart Association (USA)
4) Veterans Administration (USA)
5) Alberta Heritage Foundation for Medical Research (Canada)
6) National Science Council (Taiwan)
7) Changhua Christian Hospital (Taiwan)
8) Taichung Veterans General Hospital (Taiwan)

Honors and Awards

1973-1976	Ministry of Education Fellowship (Taiwan)
1989-1990	John Lowey Research Award of the Ohio Kidney Foundation, USA.
1992-1994	The Edward Livingston Trudeau Scholar of the American Lung Association.
1993	Fellow, The Council for High Blood Pressure Research of the American Heart Association.
1998-2001	Established Investigator Award of American Heart Association.

Selected From 74 Publications: Last five years' and project-related publications

1. Chang, C.-H., Chen, J.-G., Govindjee, R., and Ebrey, T. (1985) Cation binding by bacteriorhodopsin. Proc. Natl. Acad. Sci. USA **82,** 396-400.
2. Chang, C.-H., Govindjee, R., Ebrey, T., Bagley, K., Dollinger, G., Eisenstein, L., Marque, J., Roder, H., Vittitow, T., Fang, J.-W., and Nakanishi, K. (1985) Trans/13-cisisomerization is essential for the photocycle and proton pumping of bacteriorhodopsin. Biophys. J. **47,** 509-512.
3. Chang, C.-H., Jonas, R., Melchiore, S., Govindjee, R., and Ebrey, T. (1986) Mechanism and role of divalent cation binding by bacteriorhodopsin. Biophys. J. **49,** 731-739.
4. Chang, C.-H., Lieu, S., Jonas, R., and Govindjee, R. (1987) The pink membrane, the stable photoproduct of deionized blue membrane. Biophys. J. **52,** 617-623.
5. Hirata, M., Kohse, K. P., Chang, C.-H., Ikebe, T., and Murad, F. (1990) Mechanism of cGMP inhibition of inositol phosphate formation in rat aorta segments and cultured aortic smooth cells. J. Biol. Chem. **265,** 1268-1273.
6. Chang, C.-H., Kohse, K., Chang, B., Hirata, M., Jiang, B., Douglas, J., and Murad, F. (1990) Characterization of ATP-stimulated guanylate cyclase activation in rat lung membranes. Biochim. Biophys. Acta. **1052,** 159-165.
7. Zhou, J., Sims, C., Chang, C.-H., Berti-Mattera, L., Hopfer, U., and Douglas, J. (1990) Proximal tubular epithelial cells possess a novel 42-kDa guanine nucleotide binding regulatory protein. Proc. Natl. Acad. Sci. USA. **87,** 7532-7535.
8. Chang, C.-H., Jiang, B., and Douglas, G. J. (1991) Calcium reveals different mechanisms of guanylate cyclase activation by atrial natriuretic factor and ATP in rat lung membranes. Biochim. Biophys. Acta. **1093,** 42-46.
9. Chang, C.-H., and Song, D.-L. (1993) Melittin potentiates guanylate cyclase activation stimulated by atrial natriuretic factor and ATP. J. Biol. Chem. **268,** 4908-4911.

10. Miao, Z.-H., Song, D.-L., Douglas, J. G., and Chang, C.-H. (1995) A single amino acid mutation abolishes the catalytic activity of bacteria expressed catalytic domain of guanylate cyclase-A receptor. Hypertension **25 [2],** 694-698.
11. Haxhiu, M. A., Chang, C.-H., Dreshaj, I. A., Erokwu, B., Prabhakar, N. R., and Cherniack, N. S. (1995) Nitric oxide and ventilatory response to hypoxia. Respir. Physiol. **101,** 257-266.
12. Morbidelli, L., Donnini, S., Chang, C.-H., Douglas, J. G., Granger, H. J., Ledda, F., and Ziche, M. (1996) Nitric oxide synthase and cyclic GMP mediate vascular endothelial growth factor effects on post-capillary endothelial cells. Am. J. Physiol. **270,** H411-H415.
13. Kuo, N.-T., Agani, F. H., Haxhiu, M. A., and Chang, C.-H. (1998) A possible role for protein kinase C in CO_2/H^+-induced c-fos mRNA expression in PC12 cells. Respir. Physiol. **111,** 127-135.
14. Harwalker, S., Chang, C.-H., Dulin, N., and Douglas, J. G. (1998) Role of PLA_2 isozymes in agonist mediated signaling in proximal tubular epithelium. Hypertension **31,** 809-814.
15. Jiao, H., Cui, X.-L., Tori, M., Chang, C.-H., Alexander, L., Lapetina, E. G., and Douglas, J. G. (1998) Arachidonic acid mediates angiotensin II effects on p21ras in renal proximal tubular cells via the tyrosine kinase-Shc-Grb2-SOS pathway. Proc. Natl. Acad. Sci. USA. **95,** 7417-7421.
16. Seftel, A. D., Maclennan, G. T., Chen, Z.-J., Liu, S., Ferguson, K., Deoreo, G., Levine, F., Hample, N., and Chang, C.-H. (1999) Loss of TGFβ, apoptosis, and Bcl-2 in erectile dysfunction and upregulation of p53 and HIF-1 in diabetes-associated erectile dysfunction. Mol. Urol. **3,** 103-107.
17. Chen, Z.-J., Miao, Z.-H., Liu, S.,Che, D., Vetter, M., Dulin, N., Douglas, J. G., Murad, F., and Chang, C.-H. (2000) Molecular cloning and expression of a regulatory protein for membrane-bound guanylate cyclase. Biochem. Biophys. Res. Commun. **278,** 106-111.
18. Chen, Z.-J., Che, D., Vetter, M., Liu, S., and Chang, C.-H. (2001) 17beta-estradiol inhibits soluble guanylate cyclase activity through a protein tyrosine phosphatase. J. Steroid. Biochem. Mol. Biol. **78,** 451-458.
19. Chen, Z.-J., Song, D.-L., Miao, Z.-H., and Chang, C.-H., (2001) Proteolytic activation of membrane-bound guanylate cyclase. Biochem. Pharmacol. **61,** 915-920.
20. Chen, Z.-J., Vetter, M., Che, D., Liu, S., Tsai, M.-L., and Chang, C.-H. (2002) The bradykinin/soluble guanylate cyclase signaling pathway is impaired in androgen-independent prostate cancer cells. Cancer Lett. **177,** 181-187.

21. Vetter, M., Chen, Z.-J., Chang, G.-D., Che, D., Liu, S., and Chang, C.-H. (2003) Cyclosporin A disrupts bradykinin signaling through superoxide. Hypertension **41,** 1136-1142.
22. Mhanna, M. J., Haxhiu, M. A., jabber, M. A., Walenga, R. W., Chang, C.-H., Liu, S., and Martin, R. J. (2004) Hyperoxia impairs airway relaxation in immature rats via a cAMP-mediated mechanism. J. Appl. Physiol. **96,** 1854-1860.
23. Mhanna, M. J., Haxhiu, M. A., jabber, M. A., Walenga, R. W., Chang, C.-H., Liu, S., and Martin, R. J. (2004) Hyperoxia impairs airway relaxation in immature rats via a cAMP-mediated mechanism. J. Appl. Physiol. **96,** 1854-1860.
24. Chen, Z.-J., Vetter, M., Chang, G.-D., Liu, S., Ding, Y., and Chang, C.-H. (2004) Cyclophilin A functions as an endogenous inhibitor for membrane-bound guanylate cyclase GC-A. Hypertension. **44,** 963-968.
25. Ding, Y., Chen, Z.-J., Liu, S., Che, D., Vetter, M., and Chang, C.-H. (2005) Inhibition of Nox-4 activity by plumbagin, a plant-derived bioactive naphthoquinone. J. Pharm. Pharmacol. **57,** 111-116.
26. Sun, Z., Chang, C.-H., and Ernsberger, P. (2007) The IRAS gene encodes an I1-imidazoline binding protein: evidence from antisense. J. Neurochem. **101**, 99-108.
27. Woost, P. G., Kolb, R. J., Chang, C.-H., Finesilver, M., Inagami, T., and Hopfer, U. (2007) Development of an AT2-deficient proximal tubule cell line for transport studies. In Vitro Cell. Dev. Biol.-Animal. **43,** 352-360.
28. Yang, S.-J., Chang, S.-C., Wen, H.-C., Chen, C.-Y., Liao, J.-F., and Chang, C.-H. (2010) Plumbagin activates ERK1/2 and Akt via reactive oxygen species in 3T3-L1 cells. Eur. J. Pharmacol. 638, 21-28.
29. Yang, S.-J., Liao, J.-F., Chang, S.-C., and Chang, C.-H. (2013) Advanced glycation end products activate ERK1/2 and Akt via the epidermal growth factor receptor transactivation. PLoS ONE 8(3): e58100.
30. Kokontis JM, Lin HP, Jiang SS, Lin CY, Fukuchi J, Hiipakka RA, Chung CJ, Chan TM, Liao S, Chang CH, and Chuu CP (2014) Androgen Suppresses the Proliferation of Androgen Receptor-Positive Castration-Resistant Prostate Cancer Cells via Inhibition of Cdk2, CyclinA, and Skp2. PLoS ONE. 9, e109170.
31. Lin CH, Lin CC, Ting WJ, Pai PY, Kuo CH, Ho TJ, Kuo WW, Chang CH, Huang CY, and Lin WT. Resveratrol enhanced FOXO3 phosphorylation via synergetic activation of SIRT1 and PI3K/Akt signaling to improve the effects of exercise in elderly rat hearts. AGE 2014, 36(5):9705.
32. Huang HH, Lai CC, Chiang SC, Chang SC, Chang CH, Lin JC, and Huang CH. Brief left ventricular pressure overload reduces myocardial apoptosis. Journal of

Surgical Research. 2015, 194, 34-42.
33. Wen HC, Chuu CP, Chen CY, Shiah SG, Kung HJ, King KL, Su LC, Chang SC, Chang CH. Elevation of soluble guanylate cyclase suppresses proliferation and survival of human breast cancer cells. PLoS One. 2015, 10(4): e0125518.
34. Hu WS, Ting WJ, Chiang WD, Pai P, Yeh YL, Chang CH, Lin WT, Huang CY. The heart protection effect of Alcalase potato protein hydrolysate is through IGF1R-PI3K-Akt compensatory reactivation in aging rats on high fat diets. International Journal of Molecular Sciences. 2015, 16:10158-10172.
35. Lin HP, Lin CY, Huo C, Hsiao PH, Su LC, Jiang SS, Chan TM, Chang CH, Chen LT, Kung HJ, Wang HD, Chuu CP. Caffeic acid phenethyl ester induced cell cycle arrest and growth inhibition in androgen-independent prostate cancer cells via regulation of Skp2, p53, p21Cip1 and p27Kip1. Oncotarget. 2015, 6, 6684-707.
36. Lin HP, Lin CY, Huo C, Jan YJ, Tseng JC, Jiang SS, Kuo YY, Chen SC, Chih-Ting Wang, Liou JY, Wang J, Chang WS, Chang CH, Kung HJ, Chuu CP. Elevation of Akt3 Promotes Proliferation of Prostate Cancer Cells via regulation of Akt phosphorylation, B-Raf, TSC1, and TSC2. Oncotarget. 2015. 6, 27097-112.
37. Wang JC, Chen CY, Wen HC, Lu HC, Chang CH. (2015) Biphasic effects of resveratrol on adipogenesis: Low doses of resveratrol promote adipogenesis via induction of CD36. Journal of Nutrition and Health. Accepted.
38. Hu WS, Ting WJ, Hsieh DJY, Hsi-Hsien Hsu, Lin YM, Shen CY, Chang CH, Padma VV, Tsai Y, and Huang CY. San Huang Shel Shin Tang beta-cyclodextrin complex augmented the hepatoprotective effects against carbon tetrachloride-induced acute hepatotoxicity in rats. 2015. Submitted to BMC Complementary and Alternative Medicine.
39. Chen CY, Chang CC, Chang GD, Wen HC, Chuu CP, Huang CY, Chang CH. (2015) Suppression of adipogenesis by hyperglycemia and advanced glycation end products. PLoS ONE. In revision.
40. Chang CC, Wu HM, Huang CH, Chiu PF, Wu CL, Teng KC, Chang GD, Wen HC, Chuu CP, Chang CH. (2015) Uromodulin is predominantly glycated in the urine patients with chronic kidney disease and type 2 DM. In preparation for Kidney International.
41. Chang CC, Chen CY, Wen HC, Huang CY, Chang CH. (2015) Caveolin-1 secreted from adipose tissues and adipocytes functions as an adipogenesis enhancer. In preparation for International Journal of Obesity.