Curriculum Vitae

Ao-Lin Allen Hsu, Ph.D.
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Research Interests:

1. Role of Heat-Shock Transcription Factor (HSF-1) and its regulators in aging and longevity.
2. Role of sirtuins in stress response and aging.
3. Molecular and cellular mechanisms of the longevity response to dietary restriction (DR).
4. Nutrient sensing, metabolic shift and longevity regulation.
4. Cellular mechanism of age-associated neuromuscular functional decline.
5. Identification and characterization of small molecule that slows aging.

Education and Training:

B.S.	Chemistry	National Taiwan University	09/92 - 06/96
Ph.D.	Med. Chem. and Pharmaceutics	University of Kentucky	08/96 - 12/00
Postdoc.	Biochemistry and Biophysics	Univ. of California, San Francisco	01/01 - 09/04

Academic Appointments:

10/04	*Assistant Professor*, Department of Internal Medicine, Division of Geriatric Medicine, University of Michigan, Ann Arbor
11/05	*Assistant Professor*, Department of Molecular & Integrative Physiology, University of Michigan, Ann Arbor
02/12	*Associate Professor with tenure*, Department of Internal Medicine, Division of Geriatric and Palliative Medicine, and Department of Molecular & Integrative Physiology, University of Michigan, Ann Arbor
09/13	*Adjunct Associate Professor*, Department of Biological Science, Wayne State University, Detroit
08/13	*Professor*, Institute of Biochemistry and Molecular Biology, National Yang Ming University, Taiwan

Honors and Awards:

1995	Presidential Award,	National Taiwan University
1999-2000	Dissertation Year Fellowship,	University of Kentucky
2000	Commonwealth Research Award,	University of Kentucky
2001-2004	CIHR Postdoctoral Fellowship,	Canadian Institute of Health Research
2005	New Scholar Award in Aging,	Ellison Medical Foundation
2013-16	Recruitment of Extraordinary Talent Award (延攬特殊優秀人才措施獎勵)	Ministry of Science and Technology

2014 Outstanding Young Scientist Award (優秀年輕學者研究計畫)
Ministry of Science and Technology

Memberships in Professional Societies:

2004-pres. American Association for the Advancement of Science (AAAS)
2005-pres. The Genetics Society of America (GSA)
2009-pres. National Scientific Advisory Council, American Federation for Aging Research (AFAR)
2011-pres. The Gerontological Society of America (GSA)

Publications:

Peer-Reviewed Journals:

1. Pan FM, Chang WC, Lu SF, **Hsu AL,** and Chiou SH. (1995) "Sequence analysis of one major basic β-crystalline (β Bp) of amphibian lenses: evolutionary comparison and phylogenetic relatedness between β- and γ-crystallines." ***Biochem Biophys Res Commun***. 217(3): 940-949

2. Pan FM, Chang WC, Lin CH, **Hsu AL,** and Chiou SH. (1995) "Characterization of γ-crystalline from a catfish: structural characterization of one major isoform with high methionine by cDNA sequencing." ***Biochem Mol Bio Int.*** 35(4): 725-732.

3. Wang DS, **Hsu AL**, Song XQ, Chiou CM, and Chen CS. (1998) "Molecular recognition at the phosphatidylinositol 3,4,5-triphosphate-binding site. Studies using the permuted isomers of phosphatidylinositol triphosphate." ***J Org Chem***. 63(16): 5430-5437.

4. Lu PJ, **Hsu AL**, Wang DS, Yan HY, Yin HL, and Chen CS. (1998)"Phosphoinositide 3-Kinase signaling in rat liver nuclei." ***Biochemistry***. 37(16): 5738-5745.

5. Lu PJ, **Hsu AL**, Wang DS, and Chen CS. (1998) "Phosphatidylinositol 3,4,5-triphosphate triggers platelet aggregation by activating Ca^{2+} influx." ***Biochemistry***. 37(27): 9776-9783.

6. **Hsu, A.L.**, Lu, P.J., and Chen, C.S. (1998) "Regulation of nuclear calcium uptake by inositol phosphates and external calcium." ***Biochem Biophys Res Commun.*** 243(3): 653-656.

7. Ching, T.T., Wang, D.S., **Hsu, A.L.**, Lu, P.J., and Chen, C.S. (1999) "Identification of multiple phosphoinositide-specific phospholipases D as new regulatory enzymes for phosphatidylinositol 3,4,5-triphosphate." ***J Biol Chem***. 274(13): 8611-8617.

8. **Hsu AL**, Ching TT, Wang DS, Song XQ, Rangnekar VM, and Chen CS. (2000) "The cyclooxygenase-2 inhibitor celecoxib induces apoptosis by blocking Akt activation in human prostate cancer cells independently of Bcl-2." ***J Biol Chem***. 275(15): 11397-11403.

9. **Hsu AL**, Ching TT, Sen G, Wang DS, Bondada S, Authi KS, and Chen CS. (2000) "A novel function of phosphoinositide 3-kinase in T-cell calcium signaling: A phosphatidylinositol 3,4,5-triphosphate-mediated Ca^{2+} entry mechanism." ***J Biol Chem***. 275(21): 16242-16250.

10. Wang DS, **Hsu AL,** and Chen CS. (2001) "A phosphatidylinositol 3,4,5-triphosphate analogue with low serum-binding affinity." ***Bioorg Med Chem.*** 9(1): 133-139.

11. Johnson AJ, Song XQ, **Hsu AL,** and Chen CS. (2001) "Apoptosis signaling pathway mediated by cyclooxygenase-2 inhibitors in prostate cancer cells." ***Adv Enzyme Regul.*** 41: 221-235.

12. Ching TT, **Hsu AL**, Johnson AJ, and Chen CS. (2001) "Phosphoinositide 3-kinase facilitate antigen-stimulated Ca^{2+} influx in RBL-2H3 mast cells *via* a phosphatidylinositol 3,4,5-triphosphate-sensitive Ca^{2+} entry mechanism." ***J Biol Chem.*** 276(18): 14814-14820.

13. Johnson AJ, **Hsu AL**, Song XQ, Lin HP, and Chen CS. (2002) "The cyclooxygenase-2 inhibitor celecoxib perturbs intracellular calcium by inhibiting endoplasmic reticulum Ca^{2+}- ATPases. A plausible link with its anti-tumor effect and cardiovascular Risks." ***Biochem J.*** 366(3): 831-837.

14. Garigan D, **Hsu AL**, Fraser AG, Kamath RS, Ahringer J, and Kenyon C. (2002) "Genetic analysis of tissue aging in *C. elegans*: Heat-shock factor prevents progeria and proliferating bacteria kill the animal." ***Genetics.*** 161(3): 1101-1112.

15. Dillin A, **Hsu AL**, Arantes-Oliveira N, Lehrer-Graiwer J, Hsin H, Fraser AG, Kamath RS, Ahringer J, and Kenyon C. (2002) "Rates of behavior and aging specified by mitochondrial function during development." ***Science.*** 298(5602): 2398-401.

16. **Hsu AL**, Murphy C, and Kenyon C. (2003) "Regulation of aging and age-related disease by DAF-16 and Heat-shock factor." ***Science.*** 300(5622): 1142-1145.

17. Hansen M[#], **Hsu AL**[#], Dillin A, and Kenyon C. (2005) "New genes tied to endocrine, metabolic and dietary regulation of lifespan from a *Caenorhabditis elegans* genomic RNAi screen." ***PLoS Genetics***. 1(1): 119-134. [Epub: Jul 25, 2005; 1(1): e17] **([#] co-first authors)**

18. **Hsu AL***, Feng Z, Hsieh MY, and Xu XZ* (2009) "Identification by machine vision of the rate of motor activity decline as a lifespan predictor in *C. elegans*." ***Neurobiology of Aging.*** 30(9): 1498-1503. [Epub: Feb 5, 2008] **(*co-corresponding authors)**

19. Ching TT, Paal A, Mehta A, Zhong L, and **Hsu AL*.** (2010) "*drr-2* encodes an eIF4H that acts downstream of TOR in diet-restriction-induced longevity of *C. elegans*." ***Aging Cell***. 9(4): 545-557. [Epub: Apr 29, 2010]

20. Ching TT and **Hsu, AL*.** (2011) "Solid plate-based dietary restriction in *Caenorhabditis elegans*." ***J Vis Exp.*** (51): pii: 2701. [Epub: doi: 10.3791/2701].

21. Ching TT, Chiang WC, Chen, CS, and **Hsu AL*.** (2011) "Celecoxib extends *C. elegans* lifespan via inhibition of insulin-like signaling but not cyclooxygenase-2 activity." ***Aging Cell.*** 10(3): 506-519. [Epub: Apr 7, 2011]

22. Chiang WC, Ching TT, Lee HC, Mousigian C, and **Hsu AL*.** (2012) "HSF-1 regulators DDL-1/2 link insulin-like signaling to heat-shock response and modulation of longevity." ***Cell***. 148(1-2): 322-334.
    - Recommended by Faculty of 1000 twice.

23. Yuan Y, Kadiyala CS, Ching TT, Hakimi P, Saha S, Xu H, Yuan C, Mullangi V, Wang L, Fivenson E, Hanson RW, Ewing R, **Hsu AL***, Miyagi M***,** and Feng Z***** (2012): "Enhanced energy metabolism contributes to the extended lifespan of caloric restricted *Caenorhabditis elegans*." ***J Biol Chem***. 287(37): 31414-31426. [Epub: Jul 18, 2012] **(*co-corresponding authors)**

24. Chiang WC, Tishkoff D, Yang B, Wilon-Grady J, Yu X, Mazer T, Eckersdorff M, Gygi S, Lombard DB, and **Hsu AL*.** (2012): "*C. elegans* SIRT6/7 homolog SIR-2.4 promotes DAF-16 localization and function during stress." ***PLoS Genetics.*** 8(9): e1002948. [Epub: Sep 13, 2012]

25. Liu J, Zhang B, Lei H, Feng Z, Liu J, **Hsu AL***, and Xu XZ*. (2013): "Functional aging in the nervous system contributes to age-dependent motor activity decline in *C. elegans*." ***Cell Metabolism.*** 18(3): 392-402.
    - Selected as cover story;
    - Featured in **Previews, *Cell Metabolism***. 18(3): 303-304

26. Kumsta C, Ching TT, Nichimura M, Davis A, Gelino S, Catan HH, Panowski SH, Baird N, Chu CC, Ong B, Yu X, Bodmer R, **Hsu AL,** Hansen M (2014): " Integrin-linked kinase regulates longevity and thermo-tolerance via neuronal control of HSF-1 in *C. elegans*." ***Aging Cell***. 13(3): 419-430 [Epub: Jan 9, 2014]

27. Vukoti K, Yu X, Sheng Q, Feng Z, **Hsu AL*,** and Miyagi M***** (2015): "Age-dependent changes in protein turnover in *C. elegans*." ***J. Proteome Res***, 14(3): 1483-94. [Epub: Feb 25, 2015] **(*co-corresponding authors)** PMCID: in progress

28. Horikawa M, Sural S, **Hsu AL**, and Antebi A (2015): " Co-chaperone p23 regulates *C. elegans* lifespan in response to temperature." ***PLoS Genetics***, 11(4):e1005023. [Epub: Apr 1, 2015] PMCID: in progress

29 Huang CH, Hsu FY, Wu YH, Zhong L, Tseng MY, Kuo CJ, **Hsu AL***, Liang SS*, Chiou SH* (2015): "Analysis of lifespan-promoting effect of garlic extract by integrated metabolo-proteomics approach." ***J. Nutritional Biochem.*** 26(8) 808-817. **(*co-corresponding authors)**

30 Zhang B, Xiao R, Ronan EA, He Y, **Hsu AL**, Liu J, Xu XZ (2015): "Environmental temperature differentially modulates *C. elegans* longevity through a thermosensitive channel." ***Cell Reports***, 11(9):1414-142. [Epub: May 28, 2015]

31 Yuan Y, Hakimi P, Kao C, Kao A, Liu R, Janocha A, Boyd-Tesseler A, Hang X, Alhoraibi H, Slate E, Xia K, Cao P, Shue Q, Ching TT, **Hsu AL,** Erzurum SC, Dubyak GR, Berger NA, Hanson RW, and Feng Z (2016): "Reciprocal changes in phosphoenolpyruvate carboxykinase and pyruvate kinase with age are a determinant of aging in *C. elegans*." ***J. Biol. Chem.***, [Epub: Dec. 2, 2015; pii: jbc.M115.691766]

Papers in Preparation:

1. Ching TT, Kramer DA, Chen PC, Paal A, Zhang L, and **Hsu AL***: "Role of S-adenosylmethionine-dependent methylation in nutrient sensing and diet-restriction-induced longevity of *C. elegans*."

2. Chen YJ, Mazer T, Tseng MY, Xu XZ, Ching TT, and **Hsu AL***: "Short-term treatments of arecoline in early-life extends both health span and lifespan via GAR-2/ELG-8 pathway in *C. elegans*."

3. Liang CY, Yu X, Lombard D, and **Hsu AL***: "Specific acetylations modulate DAF-16 nuclear localization and function in stress response and longevity."

Patents:

US Patents:

2010 C. Kenyon, J. Apfeld, A. Dillin, D. Garigan**, A.L. Hsu,** J. Lehrer-Graiwer, and C. Murphy, "Eukaryotic Genes Involved in Adult Lifespan Regulation", US Patent No.: 7,794,957