

*Curriculum Vitae*  
**Jun Hee Lee**

Department of Molecular and Integrative Physiology, University of Michigan Medical School  
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**1. Personal Information**

Name : Lee, Jun Hee  
Citizenship : Republic of Korea (US Permanent Resident)

**2. Education and Training**

*A. Education*

Ph.D. (2006) Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea  
Major: Biological Sciences  
Dissertation title: Functional Analysis of p53 and LKB1 in *Drosophila*  
M.S. (2002) KAIST, Daejeon, Korea  
Major: Biological Sciences  
Dissertation title: PDZ-GEF, a Novel Component of the MAPK Pathway  
B.S. (2000) KAIST, Daejeon, Korea  
Major: Biological Sciences

*B. Training*

Postdoctoral Fellow (2007 - 2011): UC San Diego (UCSD), La Jolla, USA  
Subject: Physiological function of Sestrin proteins  
Visiting Researcher (2009 - 2011): Sanford-Burnham Institute, La Jolla, USA  
Subject: The role of Sestrin during cardiac aging  
Postdoctoral Researcher (2006 - 2007): KAIST, Daejeon, Korea  
Subject: The role of LKB1 and AMPK in regulating cell polarity

**3. Positions**

Assistant Professor (2011 - present):  
Department of Molecular and Integrative Physiology, University of Michigan Medical School, Ann Arbor, USA  
Research Assistant Professor (2011 - present):  
Institute of Gerontology, University of Michigan Medical School, Ann Arbor, USA  
Member (2011 - present)  
University of Michigan Comprehensive Core Cancer Center, Ann Arbor, USA  
Member (2012 - present)  
Center for Organogenesis, Ann Arbor, USA  
Associate Member (2012 - present):  
Michigan Gastrointestinal Peptide Research Center, Ann Arbor, USA

#### 4. Honors and Awards

1. Excellence Scholarship for 1st class new students (1997), awarded by KAIST
2. Academic Excellence Scholarship (1997-1999), awarded by KAIST
3. Suma Cum Laude (2000), awarded by KAIST
4. National Scholarship (2000-2005), awarded by MOST
5. Valedictorian (2006), nominated by KAIST
6. The best Korean Bio-scientist (2010, 2007 and 2002), nominated by Biological Research Information Center
7. 10 Outstanding Scientists (2007), nominated by Ministry of Science and Technology (MOST) and Korean Science and Engineering Foundation
8. Next Generation Postdoctoral Fellowship (2007-2008), awarded by Korea Research Foundation
9. Postdoctoral Travel Award (2010), awarded by Society for Developmental Biology
10. Human Frontier Science Program Long-term Fellowship (2008-2011), awarded by International Human Frontier Science Program Organization
11. NIH Pathway to Independence Award (2011), selected by NIA, turned down due to a conflict with assistant professorship at the University of Michigan.
12. Biological Science Scholar (2011), awarded by University of Michigan Medical School
13. Research Career Development Core Award (2012), awarded by the Claude Pepper Older Americans Independence Center at the University of Michigan
14. Pew Scholar (2012), selected by national advisory committee of Pew charitable trust, turned down due to a conflict with the EMF award.
15. Liver Scholar (2012), awarded by American Association for the Study of Liver Diseases (AASLD) and the American Liver Foundation (ALF)
16. Ellison New Scholar in Aging (2012), awarded by the Ellison Medical Foundation (EMF).
17. Basic Science Award (2013), awarded by American Diabetes Association (ADA).

#### 5. Publications

##### A. Peer-reviewed original research articles

1. Cho, K. S., **Lee, J. H.**, Kim, S., Kim, D., Koh, H., Lee, J., Kim, C., Kim, J. and Chung, J. (2001). *Drosophila* phosphoinositide-dependent kinase-1 regulates apoptosis and growth via the phosphoinositide 3-kinase-dependent signaling pathway. *Proc. Natl. Acad. Sci. USA* 98, 6144-6149.
2. **Lee, J. H.**, Cho, K. S., Lee, J., Yoo, J. and Chung, J. (2001). Dipteracin-like protein: an immune response gene regulated by the anti-bacterial gene induction pathway in *Drosophila*. *Gene* 271, 233-238.
3. **Lee, J. H.**, Cho, K. S., Lee, J., Kim, D., Lee, S. B., Yoo, J., Cha, G. H. and Chung, J. (2002). *Drosophila* PDZ-GEF, a guanine nucleotide exchange factor for Rap1 GTPase, reveals a

- novel upstream regulatory mechanism in the mitogen-activated protein kinase signaling pathway. *Mol. Cell Biol.* 22, 7658-7666.
4. Cha, G. H., Cho, K. S., **Lee, J. H.**, Kim, M., Kim, E., Park, J., Lee, S. B. and Chung, J. (2003). Discrete functions of TRAF1 and TRAF2 in *Drosophila melanogaster* mediated by c-Jun N-terminal kinase and NF-kappaB-dependent signaling pathways. *Mol. Cell Biol.* 23, 7982-7991.
  5. Kim, M., Cha, G. H., Kim, S., **Lee, J. H.**, Park, J., Koh, H., Choi, K. Y. and Chung, J. (2004). MKP-3 has essential roles as a negative regulator of the Ras/mitogen-activated protein kinase pathway during *Drosophila* development. *Mol. Cell Biol.* 24, 573-583.
  6. **Lee, J. H.**, Lee, E., Park, J., Kim, E., Kim, J. and Chung, J. (2003). *In vivo* p53 function is indispensable for DNA damage-induced apoptotic signaling in *Drosophila*. *FEBS Lett.* 550, 5-10.
  7. Kim, M., **Lee, J. H.**, Koh, H., Lee, S. Y., Jang, C., Chung, C. J., Sung, J. H., Blenis, J. and Chung, J. (2006) Inhibition of ERK-MAP kinase signaling by RSK during *Drosophila* development. *EMBO J.* 25, 3056-3067.
  8. Kim M., **Lee, J. H.**, Lee, S. Y., Kim, E. and Chung, J. (2006) Caspar, a suppressor of antibacterial immunity in *Drosophila*. *Proc. Natl. Acad. Sci. USA* 103, 16358-16364.
  9. **Lee, J. H.**, Koh, H., Kim, M., Park, J., Lee, S. Y., Lee, S. and Chung, J. (2006) JNK pathway mediates apoptotic cell death induced by tumor suppressor LKB1 in *Drosophila*. *Cell Death Differ.* 13, 1110-1122.
  10. **Lee, J. H.**, Koh, H., Kim, M., Kim, Y., Lee, S. Y., Karess, R., Lee, S., Shong, M., Kim, J., Kim, J. and Chung, J. (2007) Energy-dependent regulation of cell structure by AMP-activated protein kinase. *Nature*, 447, 1017-1020.
  11. Sun, D., Lee, G., **Lee, J. H.\***, Kim, H., Rhee, H., Park, S., Kim, K., Kim, Y., Kim, B. Y., Hong, J., Park, C., Choy, H. E., Kim, J. H., Jeon, Y. H., Chung, J. (2010) A metazoan ortholog of SpoT hydrolyzes ppGpp and functions in starvation responses. *Nat. Struct. Mol. Biol.* 17, 1188-1194. \*Co-first author but listed third.
  12. Kong, S. D., Zhang, W., **Lee, J. H.**, Brammer, K., Lal, R., Karin, M., Jin, S. (2010) Magnetically Vectored Nanocapsules for Tumor Penetration and Remotely Switchable On-Demand Drug Release. *Nano Lett.* 10, 5088-5092.
  13. Park, E. J., **Lee, J. H.**, Yu, G., He, G., Ali, S. R., Holzer, R. G., Osterreicher, C. H., Takahashi, H., Karin, M. (2010) Dietary and genetic obesity promote liver inflammation and tumorigenesis by enhancing IL-6 and TNF expression. *Cell*, 140, 197-208.
  14. **Lee, J. H.**, Budanov, A. V., Park, E. J., Birse, R., Kim, T. E., Perkins, G. A., Ocorr, K., Ellisman, M. H., Bodmer, R., Bier, E., Karin, M. (2010) Sestrin as a feedback inhibitor of TOR that prevents age-related pathologies. *Science*, 327, 1213-1218.
  15. **Lee, J. H.<sup>†</sup>**, Budanov, A. V., Talukdar, S., Park, E. J., Park, H. L., Park, H. W., Bandyopadhyay, G., Li, N., Aghajan, M., Jang, I., Wolfe, A. M., Perkins, G. A., Ellisman, M. H., Bier, E., Scadeng, M., Foretz, M., Viollet, B., Olefsky, J., Karin, M. (2012) Maintenance of metabolic homeostasis by Sestrin 2 and Sestrin3. *Cell Metab.*, 16, 311-321.  
<sup>†</sup>Co-corresponding author.
  16. Li, N., Wu, S., Holzer, R. G., **Lee, J. H.**, Todoric, J., Park, E. J., Ogata H., Gukovskaya, A. S., Gukovsky, I., Pizzo, D. P., VandenBerg, S., Tarin, D., Atay, D., Arkan, M. C., Deerinck, T. J., Moscat, J., Diaz-Meco, M., Dawson, D., Erkan, M., Kleeff, J., Karin, M. (2013) Loss of

IKK $\alpha$  causes defective autophagic protein degradation leading to accumulation of p62 aggregates that trigger spontaneous pancreatitis. *J. Clin. Invest.* In press

#### B. Review articles and Book Chapters

17. **Lee, J. H.**, Bodmer, R., Bier, E., Karin, M. (2010) Sestrins at the crossroad between stress and aging. *Aging*, 2, 369-374.
18. Budanov, A. V., **Lee, J. H.**, Karin, M. (2010) Stressin' Sestrins take an aging fight. *EMBO Mol. Med.*, 2, 388-400.
19. **Lee, J. H.**, Bier, E. (2012) The Protective role of Sestrins against chronic TOR activation and oxidative stress. *Oxidative Stress in Vertebrates and Invertebrates*, Wiley-Blackwell, pp. 337-346.
20. **Lee, J. H.** (2012) Sestrins. *McGraw-Hill 2012 Yearbook of Science & Technology*, McGraw-Hill, New York, pp. 234-237.

#### 6. Conference Abstracts

1. Cho, K. S., **Lee, J. H.**, Chung, J. and Lee, C. C. (2001) *Drosophila* TOR controls growth and proliferation in both cell-autonomous and -nonautonomous manners. *42nd Annual Drosophila Research Conference*, Washington DC., USA
2. **Lee, J. H.**, Cho, K. S. and Chung, J. (2002) *Drosophila* PDK1 regulates apoptosis and growth via PI3K-dependent pathway. *1st Korea-Japan Drosophilists' Symposium*, Seoul, Korea
3. **Lee, J. H.** and Chung, J. (2002) Dipteracin-like protein, an immune response gene regulated by the anti-bacterial gene induction pathway in *Drosophila*. *1st Korea-Japan Drosophilists' Symposium*, Seoul, Korea
4. **Lee, J. H.** and Chung, J. (2002) *Drosophila* PDZ-GEF, a novel MAPK regulator. *1st Korea-Japan Drosophilists' Symposium*, Seoul, Korea
5. Kim, M., **Lee, J. H.** and Chung, J. (2006) Functional analyses of LKB1 in *Drosophila*. *3rd Drosophila Cell Division Cycle workshop*, Porto, Portugal
6. Kim, M., **Lee, J. H.** and Chung, J. (2006) RSK Inhibits ERK-MAP Kinase Signaling during *Drosophila* Development. *The American Society for Cell Biology 46th Annual Meeting*, San Diego, USA
7. **Lee, J. H.**, Kim, M. and Chung, J. (2006) Physiological Function of LKB1 in *Drosophila*. *The American Society for Cell Biology 46th Annual Meeting*, San Diego, USA
8. **Lee, J. H.**, Budanov, A. V., Perkins G., Kim, J., Ellisman, M. H., and Karin, M. (2008) Sestrin's Physiological Role in *Drosophila* Thoracic Muscle. *Superfund Basic Research Program Annual Meeting*, Pacific Grove, USA
9. **Lee, J. H.**, Budanov, A. V., Bier, E., and Karin, M. (2008) Sestrin provides a novel link between stress and cell growth inhibition. *Gordon Research Conference on Phosphorylation & G-Protein Mediated Signaling Networks*, Biddeford, USA
10. **Lee, J. H.**, Budanov, A. V., Bier, E., and Karin, M. (2009) Sestrin, a novel regulator of TOR-dependent cell growth and metabolism. *Society for Developmental Biology 68th Annual Meeting*, San Francisco, USA

11. **Lee, J. H.**, Budanov, A. V., Bier, E., and Karin, M. (2010) Sestrin is a feedback regulator of TOR that controls cell growth and metabolism and prevents age-associated pathologies. *Society for Developmental Biology 69th Annual Meeting*, Albuquerque, USA
12. **Lee, J. H.**, Budanov, A. V., Ellisman M. H., Bodmer, R., Bier, E., and Karin, M. (2010) Feedback regulation of TOR by Sestrins is critical for prevention of age-associated pathologies, *16th Salk Institute Protein Phosphorylation & Cell Signaling meeting*, La Jolla, USA
13. **Lee, J. H.**, Budanov, A. V., Park, E. J., Birse, R., Kim, T., Perkins, G., Occor, K., Ellisman, M., Bodmer, R., Bier, E., Karin, M. (2011) Sestrin is a feedback inhibitor of TOR that prevents age-associated pathologies. *52nd Annual Drosophila Research Conference*, San Diego, USA
14. Park, H. W., Park, H. L., **Lee, J. H.** (2012) Induction of Sestrin2 in response to palmitate-induced lipotoxicity. *3rd Annual WSU-UM Joint Physiology Symposium*, Ann Arbor, Michigan

## 7. Invited talks

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| 2009 | Burnham Institute of Medical Research- <i>Development and Aging section meeting</i>                                    |
| 2010 | UCSD - <i>Pharmacology Research Seminar Series</i> .   |
| 2010 | <i>Korean-American Scientists and Engineers Association (KSEA) Seminar Series</i> .                                    |
| 2010 | UM - <i>Institute of Gerontology</i> .   |
| 2010 | Harvard Medical School - <i>Beth Israel Deaconess Medical Center</i> .   |
| 2010 | UM - <i>Department of Molecular and Integrative Physiology</i> .   |
| 2012 | UM - <i>UROP Research Seminar Series</i> .   |
| 2012 | Shock Center Research Conference - <i>Biogerontology with a Backbone: Standing on the Shoulders of Invertebrates</i> . |
| 2012 | <i>3rd Annual WSU-UM Joint Physiology Symposium</i> .  |
| 2013 | UM - <i>RCDC Seminar Series</i> .  |
| 2013 | UM - <i>Society of Biology Students Seminar Series</i> .   |
| 2013 | UM - <i>Center For Arrhythmia Research Seminar Series</i> . (scheduled)  |
| 2013 | Seoul National University - <i>Outstanding Scientist Seminar Series</i> . (scheduled)                                  |
| 2013 | <i>Korea Society for Biochemistry and Molecular Biology 2013 Annual Meeting</i> . (scheduled)                          |

## 8. Membership in Professional Societies

1. American Physiological Society (Active)
2. American Association for the Study of Liver Diseases (Active)
3. American Diabetes Association (Active)

4. American Association for Cancer Research
5. Society of Developmental Biology
6. Genetic Society of America

## 9. Teaching and Service Experiences

### A. Participation in teaching and lecturing

- 2002 BS315 (KAIST) Genetics Experiment, *Teaching Assistant*,  
 2002 BS102 (KAIST) Experimental Design in Biology, *Teaching Assistant*  
 2003 BS315 (KAIST) Genetics Experiment, *Drosophila* Genetics, *Lecturer*  
 2006 NQe362 (KAIST) Radiobiology: Introduction to Molecular Biology, *Lecturer*  
 2012 PIBS (UM) New Faculty Luncheon, *Lab Introduction*

### B. Participation in mentoring

- 2000-2006 BS495 (KAIST) BS Research, *Supervisor* (8 students)  
 2008-2010 BISP199 (UCSD) BS/MS Research, *Supervisor* (one student)  
 2011-2012 UROP (UM) Undergraduate Research Opportunity, *Supervisor* (one student)  
 2012-2013 MCDB300/400 (UM), Advanced Research, *Supervisor* (one student)

### C. Peer-review services

- 2012 *Cells* (MDPI)  
 2013 *Journal of Applied Physiology*  
 2013 *Cellular and Molecular Life Sciences*.

### D. Community services

- 2001 See-KAIST (science exhibition for non-scientific public), *Instructor*  
 2002-2004 Open-KAIST (instructive program for non-scientific public), *Instructor*  
 2010 International Education Week (UCSD), *Poster Presenter*, 2010

### E. Other leadership roles

- 1998-1999 Freshman Orientation in KAIST, *Class Instructor*  
 1998-2000 Inter-Varsity Christian Fellowship, *Group Leader*  
 2006 Korea Army Training Center, *Trainee Platoon Leader*

## 10. Research Support

### A. Current Research Support

**Liver Scholar Award** (PI: Lee, Jun Hee) 07/01/2012-06/30/2015  
 American Liver Foundation/American Association for the Study of Liver Diseases  
 Title: Protective role of Sestrin2 against obesity-associated pathologies in liver  
 The major goal of this support is to support salary of the PI while conducting the research on the function of Sestrin2 in liver metabolism in mice.

**New Scholar Award in Aging** (PI: Lee, Jun Hee) 08/01/2012-07/31/2016

Ellison Medical Foundation (AG-NS-0932-12)

Title: Sestrins at the crossroads between nutrition, aging and metabolism.

The major goal of this support is to generate and exploit mouse models for assessing the role of Sestrins in metabolic homeostasis in the context of aging and obesity.

**ADA Basic Science Award** (PI: Lee, Jun Hee)

01/01/2013-12/31/2015

American Diabetes Association (1-13-BS-106)

Title: Maintenance of insulin signaling sensitivity by sestrin2-mediated feedback loop

The major goal of this support is to study the mechanistic details of how mouse Sestrin2 contributes to the maintenance of insulin signaling sensitivity during obesity.

**Geriatrics Center Pilot Grant** (PI: Lee, Jun Hee)

09/01/2012-08/31/2013

Claude Pepper Older Americans Center/NIH (P30 AG024824)

Title: The role of Sestrin 2 and 3 against age- and obesity-associated metabolic derangements

The goal of this support is to investigate if concomitant mutation of *Sesn2* and *Sesn3* can cause severe metabolic derangements in liver during normal aging and upon obesity

**Aging Rodent Core Support** (PI: Lee, Jun Hee)

02/16/2012-06/30/2014

Nathan Shock Center of Excellence in Aging/NIH (P30 AG013283)

The major goals of this support are (i) to investigate whether *Sesn2/3* are protecting aged animals from developing metabolic abnormalities, and (ii) to generate *Sesn1*-knockout mice for future investigation about *Sesn1*'s myoprotective function during muscle aging.

**MCubed Research Initiative** (PI: Lee, Jun Hee)

01/01/2013-06/30/2014

University of Michigan

Title: Understanding Beneficial Effects of Sestrins, Exercise and Mitophagy

The goal of this support is to conduct pilot experiments in *Drosophila* to see whether Sestrin overexpression can be used as exercise mimetics and can produce beneficial effects in extending health span.

**RCDC Award** (PI: Lee, Jun Hee)

09/01/2012-08/31/2013

Claude Pepper Older Americans Center/NIH (P30 AG024824)

The goal of this support is to support salary of the PI while conducting the research on the function of Sestrin-family proteins during aging and age-associated pathologies.

### *B. Completed Research Support*

**LT00653/2008-L** (PI: Lee, Jun Hee)

08/01/2008-07/31/2011

The International Human Frontier Science Program Organization

Title: IKKa as a component of TGF $\beta$  signaling in prostate cancer (CaP).

The major goal of this project is to investigate genetic and functional relationships between IKKa and TGF $\beta$  signaling in *Drosophila* and mouse prostate cancer model.

**KRF-2007-C00096** (PI: Lee, Jun Hee)

08/01/2007-07/31/2008

Korea Research Foundation

Title: Molecular mechanism of chronic inflammation-promoted tumorigenesis.

The major goals of this project are to investigate the mechanistic relationship between inflammation and tumorigenesis using mouse cancer models.