BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Curran, Sean Patrick	Assistant Professor
eRA COMMONS USER NAME (credential, e.g., agency login) scurran	

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

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
University of California, Los Angeles	B.S.	1995-1999	Biochemistry
University of California, Los Angeles	Ph.D.	1999-2004	Biochemistry and Molecular Biology
Massachusetts General Hospital and Harvard Medical School	Post-doctoral Fellow	2004-2010	Molecular Biology and Genetics

A. Personal Statement

The goal of our research program is to understand the molecules, genes and cells that impact aging and age related diseases such as diabetes, obesity, cancer, and frailty. We have characterized numerous single gene mutations that can influence the rate of aging and the development of these age related conditions. Among the genes we have characterized, that most potently influence the rate of aging in *C. elegans* are those that are essential for growth and development. We have found that these genes also have strongest impact on the development of metabolic disorders as they disrupt energy homeostasis leading to severe changes in adiposity. We have recently identified *skn*-1 as a potent modulator of the increased lifespan phenotype that results from the post-developmental inactivation of essential genes in the worm. SKN-1 plays multiple important roles in the organism. We have generated novel SKN-1 activation mutants that will facilitate the identification of the regulator pathways that coordinate SKN-1 specificity in response to numerous cellular stress conditions. We have also identified a novel role for SKN-1 in the response to mitochondrial homeostasis. My background in high throughput RNAi screening, classical genetics, and molecular biology in combination with my doctoral training in mitochondria homeostasis and biochemistry will be essential for the success of these projects. With our established worm models we are in the unique position to study the role of *skn-1* in the context of control of organismal lifespan and response to stress. We have already developed the reagents and strains needed in worm to study all of the proposed experiments. Taking advantage of the speed of discovery in *C. elegans,* we are uniquely poised to quickly uncover the regulatory pathways that govern *skn-1* function and translate our findings to mammalian systems (Nrf). We have also developed a method for testing the SKN-1 pathways we identify in the worm in a Nrf2 human cell culture system. The ability to translate our findings from our extensive collection of SKN-1 activation mutants to the pathways that govern human Nrf activity will help us accomplish our ultimate goal of developing novel therapies for the many conditions that develop with age.

B. Positions and Honors

Employment:

September 1998-July 1999	Research Assistant, laboratory of Jody E. Margulies Cedars Sinai Medical Center, Los Angeles, CA
September 1999-June 2004	Doctoral student, laboratory of Carla M. Koehler Department of Chemistry and Biochemistry University of California, Los Angeles
July 2004-August 2010	Postdoctoral Research Fellow, laboratory of Gary Ruvkun Department of Genetics, Harvard Medical School Department of Molecular Biology, Massachusetts General Hospital

August 2010 – Present	Assistant Professor. University of Southern California Davis School of Gerontology Dornsife College of Letters, Arts, and Sciences Keck School of Medicine

Fellowships, Awards & Honors:

2012	USC Mellon Mentoring Award
2012	Outstanding Faculty Award - USC Davis School of Gerontology
2011	Ellison Medical Foundation – Young Scholar in Aging
2009	Glenn Award for research in the biological mechanisms of lifespan regulation
2009	National Institutes of Health - K99 AG032308
2005	National Institutes of Health - National Research Service Award F32 AG026207
2003	Dissertation year fellowship, UCLA
2003	John M. Jordan Memorial Award
2002	Jacobs Award, UCLA
2001	Regents award, UCLA
2000	Excellence in teaching award, UCLA
2000	USPHS National Research Service Award GM07185
1998	Gold Family Foundation Scholarship in Biochemistry
1991	Eagle Scout

Professional Societies:

Member, American Society of Cell Biology (ASCB)
Member, Genetics Society of America (GSA)
Member, American Society of Biochemistry and Molecular Biology (ASBMB)
Member, Gerontological Society of America (GSA)

C. Selected peer-reviewed publications (in chronological order).

1. M.P. Murphy, D. Leuenberger, **S.P. Curran**, W. Oppliger, and C.M. Koehler. The essential function of the small Tim proteins in the Tim22 import pathway does not depend on formation of the soluble 70-kilodalton complex. Mol Cell Biol. 2001 Sep 15;21(18):6132-6138
2. **S.P. Curran**, D. Leuenberger, W. Oppliger, and C.M. Koehler. The chaperone-like Tim9p-Tim10p complex binds to the transmembrane domains of the ADP/ATP carrier. EMBO J. 2002 Mar 1;21:942-953
3. K. Roesch, **S.P. Curran**, L. Tranebjaerg, and C.M. Koehler. Human deafness dystonia syndrome is caused by a defect in assembly of the DDP1/TIMM8a-TIMM13 complex. Hum. Mol.Genet. 2002 Mar 1;11(5):477-486
4. **S.P. Curran**, D. Leuenberger, E. Schmidt and C.M. Koehler. Tim23p follows a conserved translocation mechanism for reaching the mitochondrial inner membrane. J Cell Biol. 2002 Sep 16;158(6):1017-1027
5. D. Leuenberger, **S.P. Curran**, D. Wong, and C.M. Koehler. The role of Tim9p in the assembly of the TIM22 import complexes. Traffic 2003 Mar; 4(3): 144-152
6. **S.P. Curran**, D. Leuenberger, E.P. Leverich, D.K. Hwang, K. Beverly, and C.M. Koehler. The role of Hot13p and redox chemistry in the mitochondrial TIM22 import pathway. J Biol Chem. 2004 Oct 15;279(42):43744-51
7. **S.P. Curran**, E.P. Leverich, C.M. Koehler, and P.L. Larsen. How defective mitochondrial biogenesis leads to developmental defects in Caenorhabditis elegans. J Biol Chem. 2004 Dec 24;279(52):54655-62
8. V.A. Likic, A. Perry, J. Hulett, M. Derby, A. Traven, R.F. Waller, P.J. Keeling, C.M. Koehler, **S.P. Curran** P.R. Gooley, T. Lithgow. Patterns that define the four domains conserved in known and novel isoforms of the protein import receptor Tom20. J. Mol Biol. 2005 Mar 18;347(1):81-93
9. **S.P. Curran** and G. Ruvkun (2007) Lifespan regulation by evolutionarily conserved genes essential for viability. PLoS Genet Apr 6;3(4):e56. Doi:10.1371/journal.pgen.0030056
10. **S.P. Curran**, X., Wu, Riedel, C, and G. Ruvkun. A soma-to-germline transformation phenotype in *C. elegans* longevity mutants. Nature. 2009 Jun 25;459(7250):1079-84

11. J. Paek, J.Y. Lo, S.D. Narasimhan, T.N. Nguyen, K. Glover Cutter, S. Robida-Stubbbs, T. Suzuki, M. Yamamoto, T.K. Blackwell, **S.P. Curran**. Mitochondrial SKN-1/Nrf Mediates a Conserved Starvation Response. Cell Metab. 2012 Oct 3;16(4):526-37

12. R. Tacutu, D.E. Shore, A. Budovsky, J.P. de Magalhaes, G. Ruvkun, V.E. Fraifeld, and **S.P. Curran**. Prediction of *C. elegans* longevity genes by human and worm longevity networks (In Press) 10.1371/journal.pone.0048282

Additional recent publications of importance to the field (in chronological order)

1. **S.P. Curran** and C.M. Koehler. 2004. Mitochondrial Biogenesis. Protein import into and across the inner membrane. Koehler, C. and Bauer, M. (eds.) *Topics in Current Genetics*. Springer Verlag, Heidelberg, 2004
2. D. Leuenberger, **S.P. Curran**, and C. M. Koehler. 2004. Mitochondrial biogenesis in Mullins, C. (ed.) *The Biogenesis of Cellular Organelles.* Landes Bioscience, Georgetown
3. **S.P. Curran** 2008. Conserved Mechanisms of lifespan regulation and extension in *C. elegans* in Brown-Borg, H. and Sell C. (ed.) *Life Span Extension: Single Cell Organisms to Man.* Humana Press Inc, Aging Medicine
4. S. Pang, S.P. **Curran**. 2012. Longevity and the long arm of epigenetics: acquired parental marks influence lifespan across several generations. Bioessays 34(8): 652-654

D. Research Support

Ongoing Research Support

K99/R00 AG032308 Curran (PI) 04/01/11 - 03/31/2014
Evolutionarily conserved mechanisms of lifespan regulation
No overlap in research proposed

Ellison Medical Foundation – Young Scholar in Aging Curran (PI) 07/01/2011 – 06/31/2015
Genetics of exceptional longevity
No overlap in research proposed

Completed Research Support

F32 AG026207
04/01/05 - 03/31/2008
Neuronal outputs regulated by insulin signaling
Ruth L. *Kirschstein* National Research Service Award: To identify genes that potently regulate lifespan in neuronal tissues.
Role: PI