PANKAJ KAPAHI

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EDUCATION

1995-1999	**Ph.D.** - University of Manchester, UK.
1992- 1995	**BSc** - St. Georges Hospital Medical School, University of London. *Magna Cum Laude*. First class honors in Biochemistry with Medical Sciences.
1990	**A levels** - Physics (A), Chemistry (A) and Maths (A).

EMPLOYMENT HISTORY

02/14 – present	Buck Institute for Research on Aging, Novato, CA. *Professor*
06/12 – present	University of California, San Francisco, Dept of Urology *Adjunct Associate Professor.*
02/10 – 02/14	Buck Institute for Research on Aging, Novato, CA. *Associate Professor.*
09/04 **–** 01/10	Buck Institute for Research on Aging, Novato, CA. *Assistant Professor.*
01/00 – 09/04	Division Biology, California Institute of Technology, Pasadena, CA. *Postdoctoral Research Fellow*. Mentor: Dr. Seymour Benzer.
01/99 – 01/00	Department of Pharmacology, University of California, San Diego, CA. *Postdoctoral Research Fellow*. Mentor: Dr. Michael Karin.
09/95 – 01/99	Department of Gerontology, University of Manchester, Manchester, UK. *Graduate student.* Mentor: Dr. Thomas B. L. Kirkwood.
06/90 – 08/92	Rheumatology Unit, Hammersmith Hospital, London, UK. *Research Associate.* Mentor: Dr. Dorian O. Haskard.

HONORS AND AWARDS

2015	Glenn AFAR award
2011	Julie Martin AFAR Mid-Career Award in Aging Research.
2010	Gerontological Society of America's Nathan Shock New Investigator Award.
2010	EUREKA Award, National Institute of Aging.
2006	'Breakthrough in Gerontology' (BIG) award from the Glenn/AFAR Foundation.
2005	Ellison New Scholar Award.
2001	Project grant from American Federation of Aging Research.
2001	John Douglas Alzheimer Foundation Postdoctoral Fellowship.
1998	Wellcome Prize International Postdoctoral Fellowship.
1998	Wellcome Prize Ph.D. Studentship.
1995	The Pollock Prize (*Magna Cum Laude*).

PROFESSIONAL ORGANIZATIONS

Memberships
2006 – Pres. The Gerontological Society of America
2006 – Pres. Genetics Society of America

Service to Professional Organizations
Chair, Gordon Conference on Biology of Aging, 2013.
Organizing Committee Member, Aging, Metabolism, Stress, Pathogenesis, and Small RNAs in *C. elegans*, UW-Madison, August 2010.
Organizer, Bay Area Worm Meeting, 2009-present.
Organizer, Buck Institute Symposium, 2007, "Nutrient Signaling and Aging," November 2007.
Initiated the formation of the Joint Masters Research Program between Dominican University and Buck Institute.

Service to Scientific Journals
2009- Pres. Section Editor, Aging Cell
2009- 2014. Editor, PLoS one
2010- Pres. Editorial board, Aging
2010- Pres. Editorial board, Healthspan
2011- Pres. Member of 'Faculty of 1000'.

PERSONAL STATEMENT

As a student of Seymour Benzer and Michael Karin, I have been inspired to carry out rigorous and innovative science as well as the value of good mentoring. In particular, the work of Seymour has inspired me to establish invertebrate models that are important to understanding important biological problems and human diseases. Seymour had a remarkable career, which led to landmark discoveries in fields of genetics, circadian clock biology, development, behavior and memory using the fly as a model. Towards the later part of his career in the 1980s, he pioneered the use of invertebrates in modeling human diseases which was initially met with skepticism but over time led to many breakthroughs. The experience in Seymour's laboratory was transformative and enlightening as it helped me realize the power of genetic approaches using invertebrate model systems for understanding biology and modeling human diseases. The power of the invertebrate models is beautifully captured in his biography 'Time, love and memory', which strongly influenced my decision to join his laboratory. This experience has been instrumental in guiding my lab's research at the Buck Institute for Research on Aging, since 2004.

My laboratory has made significant contributions in the areas of nutrient responses, aging, and metabolism. We were one of the first to identify the role of target of rapamycin (TOR) and implicate mRNA translation in mediating lifespan extension by dietary restriction. This work has led to a paradigm shift in the understanding mechanistic underpinnings of dietary restriction (DR). TOR has emerged as one of the most promising targets for lifespan extension and age-related diseases. Inhibition of the TOR pathway has been shown to extend lifespan in yeast, worms, flies and recently even mice. My laboratory studies the effects of nutritional manipulation on metabolism and healthspan using worms and flies. A key contribution of the laboratory has been that modulation of mRNA translation, a critical output of the TOR pathway, plays a significant role in determining lifespan in worms and flies. We demonstrated that inhibition of cap-dependent protein translation via eIF4E binding protein (4EBP) downstream of the TOR pathway played a critical role in regulating lifespan extension by DR in *D.*

melanogaster. More recently, we demonstrated that inhibition of eIF4G extends lifespan by preferentially enhancing translation of genes associated with stress responses. We also identified a critical role for enhanced fat turnover upon DR in mediating the lifespan extension upon DR. My laboratory employs an interdisciplinary approach, combining biochemical, genetic and genomic techniques, to understand how nutrients modulate changes in lifespan and metabolism using *D. melanogaster*, *C. elegans* and recently mammalian cell culture. More recently, we have also identified a critical role for circadian clocks in mediating the lifespan extension and changes in fat metabolism upon dietary restriction.

CONTRIBUTIONS TO SCIENCE

(over 100 peer reviewed articles, h index- 58 and i-10 index- 100)

1. Determining the mechanisms of lifespan extension by dietary restriction (DR).
One of the major goals of my lab has been to uncover the mechanisms behind lifespan extension through dietary restriction (DR), a well-established intervention that extends lifespan across species. After our discovery of the target of rapamycin (TOR) as a key mediator of DR's effects, we shifted focus to downstream effectors that modulate nutrient-dependent responses. Recently, we identified an important role of peripheral circadian clocks in this process, finding that DR enhances the amplitude of circadian gene expression, which plays a critical role in metabolic regulation.
One of our key discoveries was the demonstration that DR enhances fatty acid synthesis and degradation in the intestine and muscle, showing that this increased fatty acid metabolism is essential for lifespan extension. We also demonstrated that enhanced fatty acid metabolism in muscle and increased physical activity are required for DR-mediated lifespan extension. Importantly, our recent studies revealed that circadian clocks are critical for optimizing fat turnover and achieving maximum lifespan extension under DR conditions.
To expand on this, we conducted screens to identify natural genetic variants that influence DR-induced changes in metabolic traits and lifespan, in collaboration with the Brem and Promislow labs. These efforts have resulted in several papers, including a significant finding that the gene mtd/OXR1 is essential for the protective effects of DR on lifespan and neurodegeneration. Moreover, our collaborator Dr. Seyfried has identified that OXR1, along with several other retromer genes, is associated with Alzheimer's disease pathology in humans. OXR1 and its co-regulated genes also decline with age in the human brain, underscoring their importance in age-related neurodegenerative diseases. These findings highlight the intricate links between metabolism, circadian rhythms, and aging, advancing our understanding of how DR impacts lifespan and health.

- Wilson KA, Bar S, Dammer EB, Carrera EM, Hodge BA, Hilsabeck TAU, Bons J, Brownridge GW 3rd, Beck JN, Rose J, Granath-Panelo M, Nelson CS, Qi G, Gerencser AA, Lan J, Afenjar A, Chawla G, Brem RB, Campeau PM, Bellen HJ, Schilling B, Seyfried NT, Ellerby LM, **Kapahi P**. OXR1 maintains the retromer to delay brain aging under dietary restriction. *Nat Commun*. 2024 Jan 11;15(1):467. doi: 10.1038/s41467-023-44343-3. PubMed PMID: 38212606; PubMed Central PMCID: PMC10784588.
- Dietary restriction and clock delay eye aging to extend lifespan in *D. melanogaster.* Hodge BA, Meyerhof GT, Katewa SD, Lian T, Lau C ,Bar S, Leung NY, Li M, Li-Kroeger D, Melov S, Schilling B, Montell C, **Kapahi P**. 2022 *Nat Commun* 13(1):3156 *PMC9174495*
- Katewa SD, Akagi K, Bose N, Rakshit K, Camarella T, Zheng X, Hall D, Davis S, Nelson CS, Brem RB, Ramanathan A, Sehgal A, Giebultowicz JM, **Kapahi P**. (2016) Peripheral clocks modulate lifespan and fat metabolism upon dietary restriction. *Cell Metab* Jan 12;23(1):143-54: *PMC4715572*

- Katewa SD, Demontis F, Kolipinski M, Hubbard A, Gill MS, Perrimon N, **Kapahi P**. Intramyocellular fatty-acid metabolism plays a critical role in mediating responses to dietary restriction in Drosophila melanogaster. Cell Metab. 2012;16(1):97-103. PMCID:PMC3400463

2. Characterizing the role of TOR as a key mediator of lifespan extension in flies and worms.
During my postdoctoral work, we were among the first groups to identify the role of the target of rapamycin (TOR) in mediating lifespan extension through dietary restriction (DR). This research has led to a paradigm shift in understanding the mechanistic underpinnings of DR. TOR has since emerged as one of the most promising targets for lifespan extension and age-related diseases. Inhibition of the TOR pathway has been shown to extend lifespan in yeast, worms, flies, and even mice.
In a prior study, we identified the role of 4E-BP and differential mRNA translation in mediating metabolism and lifespan extension under DR. Notably, we discovered a novel role for 4E-BP in enhancing mitochondrial mRNA translation through the 5'UTR element of nuclear-encoded mitochondrial genes, representing a new mode of boosting mitochondrial function.
We have also conducted in-depth investigations into the role of S6 kinase in modulating lifespan. This work revealed a novel role for HIF-1 and IRE-1 as part of a nutrient-responsive pathway downstream of S6 kinase, which mediates the effects of DR in *C. elegans*. Additionally, we observed an almost fivefold extension in lifespan by combining long-lived insulin-like receptor mutants (daf-2) with S6 kinase mutants. This finding opens the possibility of synergistic lifespan extension by combining treatments that inhibit insulin-like signaling and TOR pathways in other species.

- Chen D, Li P. W., Goldstein, B. A., Cai, W., Thomas, E. L., Chen, F., Hubbard, A. E., Melov, S., **Kapahi, P**. (2013) Germline Signaling Mediates the Synergistically Prolonged Longevity Produced by Double Mutations in *daf-2* and *rsks-1* in *C. elegans*. *Cell Rep*, 5:1600-10. *PMC3904953*
- Chen D, Thomas EL, **Kapahi P**. (2009) HIF-1 modulates dietary restriction-mediated lifespan extension via IRE-1 in *Caenorhabditis elegans*. *PLoS Genet* **5**:e1000486. *PMC2676694*.
- **Kapahi P**, Zid BM, Harper T, Koslover D, Sapin V, Benzer S. (2004) Regulation of lifespan in Drosophila by modulation of genes in the TOR signaling pathway. *Curr Biol 14:885-90. PMC2754830.*
- Zid BM, Rogers AN, Katewa SD, Vargas MA, Kolipinski MC, Lu TA, **Kapahi P**. (2009) 4E-BP extends lifespan upon dietary restriction by enhancing mitochondrial activity in Drosophila. *Cell* 139:149-60. *PMC2759400*.

3. Determining a critical role for inhibition of mRNA translation in slowing aging by mediating antagonistic pleiotropy using *C. elegans*.
Our lab was one of the pioneers in discovering that the inhibition of mRNA translation extends lifespan. In a subsequent study, we employed a novel genetic screen to identify key genes involved in mRNA translation and protein synthesis. While these genes play critical roles in growth and development, our findings revealed that if their activity is inhibited later in life, they can extend lifespan significantly. This work opened up new avenues for understanding how fundamental cellular processes influence aging.
Two of our recent studies have further elucidated the mechanisms by which inhibiting mRNA translation extends lifespan. We demonstrated that inhibition of global mRNA translation—whether through genetic manipulation or dietary restriction—paradoxically enhances the selective translation of stress response genes. These genes play a pivotal role in mediating the lifespan extension observed under these conditions. In essence, while general protein synthesis is reduced, the translation of specific mRNAs related to stress response and longevity pathways is upregulated, enabling cells to better cope with environmental and physiological stresses.
This discovery offers profound insights into the relationship between protein synthesis, cellular stress responses, and aging. By selectively enhancing the expression of stress-related genes, organisms can mount a more efficient defense against age-related damage, thereby promoting healthier aging. Our

research also suggests that targeting specific aspects of mRNA translation could provide novel therapeutic avenues for age-related diseases and longevity.

- Rogers AN, Chen D, McColl G, Czerwieniec G, Felkey K, Gibson BW, Hubbard A, Melov S, Lithgow GJ, **Kapahi P**. Life span extension via eIF4G inhibition is mediated by posttranscriptional remodeling of stress response gene expression in *C. elegans*. *Cell Metab.* 2011 Jul 6;14(1): 55-66. *PMC3220185*
- Pan KZ, Palter JE, Rogers AN, Olsen A, Chen D, Lithgow GJ, **Kapahi P**. (2007) Inhibition of mRNA translation extends lifespan in *Caenorhabditis elegans*. *Aging Cell.* 6(1):111-9. *PMC2745345*.
- Chen D, Pan KZ, Palter JE, **Kapahi P**. (2007) Longevity determined by developmental arrest genes in *Caenorhabditis elegans*. *Aging Cell.* 6(4):525-33. *PMC2746107*.
- Wilson KA, Chamoli M, Hilsabeck TA, Pandey M, Bansal S, Chawla G, **Kapahi P**. Evaluating the beneficial effects of dietary restrictions: A framework for precision nutrigeroscience. Cell Metab. 2021;33(11):2142-73. PMCID:PMC8845500

4. Modeling of diseases that are sensitive to nutrient status.

Our lab has developed models to study various human diseases in invertebrates and mice, focusing on the role of nutrient signaling pathways in pathological processes. These models allow us to examine the effects of dietary factors on disease progression and uncover potential therapeutic targets. For instance, we demonstrated that *C. elegans* can be used to study the accumulation of advanced glycation end-products (AGEs) in a glucose-dependent manner, leading to pathologies similar to those seen in diabetic complications. In a recent review, we highlighted the potential causal connection between AGEs, aging, and disease. Notably, we identified TRPA1 as a sensor for methylglyoxal (MGO), a reactive AGE precursor, which activates the SKN-1 pathway. Through a drug screen, we discovered that podocarpic acid can activate TRPA1, thereby reducing the harmful effects of AGE accumulation. This represents a promising avenue for targeting AGE-related pathologies.

In addition, we have developed models to study calcification processes in *Drosophila*. Collaborating with Dr. Stoller, a urologist, we have also used flies and mice to study urinary stone diseases. In a recent study, we demonstrated that lipoic acid can significantly reduce cystine formation in a mouse model of cystinuria. This research led to an FDA/NIH-funded clinical trial at UCSF, which is currently showing promising preliminary results. Recently, we established a *Drosophila* model to study uric acid pathologies, which are linked to conditions like gout. Our studies revealed that diet plays a key role in modulating uric acid accumulation, and we identified a conserved role for the insulin-like signaling pathway in regulating purine synthesis and uric acid concretion. These findings suggest that targeting nutrient signaling pathways may be an effective strategy for managing uric acid-related diseases. These disease models provide critical insights into the interaction between diet and pathology, opening new paths for potential interventions in human health.

- Lang S, Hilsabeck TA, Wilson KA, Sharma A, Bose N, Brackman DJ, Beck JN, Chen L, Watson MA, Killilea DW, Ho S, Kahn A, Giacomini K, Stoller ML, Chi T, **Kapahi P**. (2019) A conserved role of the insulin-like signaling pathway in diet-dependent uric acid pathologies in Drosophila melanogaster. PLoS Genet *PMC6695094*
- Chaudhuri J., Bains Y, Guha S, Kahn A, Hall D, Bose N, Gugliucci A, **Kapahi P.** The Role of Advanced Glycation End Products in Aging and Metabolic Diseases: Bridging Association and Causality. *Cell Metabolism,* Volume 28, 4 September 2018, Pages 337-352, *PMC6355252*
- Zee T, Bose N, Zee J, Beck JN, Yang S, Parihar J, Yang M, Damodar S, Hall D, O'Leary MN, Ramanathan A, Gerona RR, Killilea DW, Chi T, Tischfield J, Sahota A, Kahn A, Stoller ML, **Kapahi P**. α-Lipoic acid treatment prevents cystine urolithiasis in a mouse model of cystinuria. *Nat Med.* 2017 Mar;23(3):288-290. doi: 10.1038/nm.4280. *PMC5656064*

- Chaudhuri J, Bose N, Gong J, Hall D, Rifkind A, Bhaumik D, Peiris TH, Chamoli M, Le CH, Liu J, Lithgow GJ, Ramanathan A, Xu XZ, **Kapahi P**. A Caenorhabditis elegans Model Elucidates a Conserved Role for TRPA1-Nrf Signaling in Reactive α-Dicarbonyl Detoxification. 2016 *Curr Biol.* (16)31073-9. *PMC5135008*

5. Mechanisms that drive inflammation in aging and disease.

Following our observations on lifespan extension through TOR inhibition, I have collaborated with the Campisi lab to investigate its role in cellular senescence and inflammation. We demonstrated that TOR inhibition suppresses the senescence-associated secretory phenotype (SASP), a pro-inflammatory state linked to aging. Furthermore, we found that commonly used drugs like simvastatin also inhibit SASP. These findings are significant as they highlight the protective effects of both TOR inhibitors and statins in mitigating many age-related diseases.

In a recent collaborative study with the Campisi lab, my lab utilized SILAC (Stable Isotope Labeling by Amino Acids in Cell Culture) analysis to define the constituents of the SASP. This analysis revealed a previously unrecognized role for cellular senescence in hemostasis, further expanding our understanding of the biological consequences of senescence. These findings underscore the potential therapeutic benefits of targeting SASP in aging and age-related conditions. Additionally, my lab has developed a research program focusing on methylglyoxal (MGO) and advanced glycation end-products (AGEs) as significant drivers of aging and cellular senescence. We are exploring how these compounds contribute to age-related tissue damage and inflammatory responses.

In a prior study, I investigated the mechanisms by which NF-kappa B, a key regulator of inflammation, is inhibited. By modulating Ikappa B Kinase (IKK), I identified a critical cysteine residue that is targeted by various NF-kappa B inhibitors, including prostaglandins, arsenite, and hypoestoxide. This work has contributed to a deeper understanding of how inflammation can be controlled, offering potential avenues for therapeutic intervention in age-related inflammatory diseases. These studies collectively advance our understanding of how inflammation contributes to aging and highlight potential strategies for mitigating their effects on age-related diseases.

- Wiley CD, Liu S, Limbad C, Zawadzka AM, Beck J, Demaria M, Campisi J, **Kapahi P** (2019) SILAC Analysis Reveals Increased Secretion of Hemostasis-Related Factors by Senescent Cells. *Cell Rep*.;28(13):3329-37 e5. *PMC6907691*
- Liu S, Uppal H, Demaria M, Desprez PY, Campisi J, **Kapahi P. (**2015) Simvastatin suppresses breast cancer cell proliferation induced by senescent cells. *Scientific Reports 14;5:17895*: *PMC4677323*
- Laberge RM, Sun Y, Orjalo AV, Patil CK, Freund A, Zhou L, Curran SC, Davalos AR, Wilson-Edell KA, Liu S, Limbad C, Demaria M, Li P, Hubbard GB, Ikeno Y, Javors M, Desprez PY, Benz CC, **Kapahi P**, Nelson PS, Campisi J. (2015) mTOR regulates the Tumor-Promoting Senescence-Associated Secretory Phenotype. *Nature Cell Biol* 17:1049-1061. *PMC4691706*
- Rossi A*, **Kapahi P***, Natoli G, Takahashi T, Chen Y, Karin M. (2000) Anti-inflammatory cyclopentenone prostaglandins are direct inhibitors of IkappaB kinase. (**joint first authors*) *Nature*. 403(6765):103-8. (**joint first authors*) PMID10638762

Complete List of Published Work in MyBibliography

https://www.ncbi.nlm.nih.gov/sites/myncbi/pankaj.kapahi.1/bibliography/40322243/public/?page=1

total citations >13200; h-index, 58; i-index, 100

PUBLICATIONS

1. Bar S, Wilson KA, Dammer EB, Schilling B, Seyfried NT, Ellerby LM, **Kapahi P**. Neuronal glycogen breakdown exerts a neuroprotective effect in models of Alzheimer's disease by enhancing flux through the pentose phosphate pathway. under review in *Nat Metabolism*

2. Tyler A U Hilsabeck, Vikram P Narayan, Kenneth A Wilson, Enrique Carrera, Daniel Raftery, Daniel Promislow, Rachel B Brem, Judith Campisi, **Pankaj Kapahi.** Machine Learning identifies conserved traits that influence lifespan and healthspan responses to dietary restriction. Preprint bioRxiv. 2023 Jul 13:2023.07.09.548232. doi 10.1101/2023.07.09.548232: Accepted *Nat Communications*

3. Lauren Wimer, Kiyomi R Kaneshiro, Jessica Ramirez, Martin Valdearcos Contreras, Muniesh Shanmugam, Dominique Gaffney, Parminder Singh, Jennifer Beck, Durai Sellegounder, John Newman, James Galligan, Suneil Koliwad, **Pankaj Kapahi**. Combination therapy of glycation lowering compounds reduces caloric intake, improves insulin sensitivity and extends lifespan. *BioRxiv*. 2022. www.biorxiv.org/content/biorxiv/early/2022/08/13/2022.08.10.503411.full.pdf under review at *Cell Metab*

4. Wilson KA, Bar S, Dammer EB, Carrera EM, Hodge BA, Hilsabeck TAU, Bons J, Brownridge GW 3rd, Beck JN, Rose J, Granath-Panelo M, Nelson CS, Qi G, Gerencser AA, Lan J, Afenjar A, Chawla G, Brem RB, Campeau PM, Bellen HJ, Schilling B, Seyfried NT, Ellerby LM, Kapahi P. OXR1 maintains the retromer to delay brain aging under dietary restriction. *Nat Commun*. 2024 Jan 11;15(1):467. doi: 10.1038/s41467-023-44343-3. PubMed PMID: 38212606; PubMed Central PMCID: PMC10784588.

5. Sara Ahadi, Kenneth A Wilson Jr, Boris Babenko, Cory Y McLean, Drew Bryant, Orion Pritchard, Ajay Kumar, Enrique M Carrera, Ricardo Lamy, Jay M Stewart, Avinash Varadarajan, Marc Berndl, **Pankaj Kapahi,** Ali Bashir. Longitudinal fundus imaging and its genome-wide association analysis provide evidence for a human retinal aging clock. Elife. 2023 Mar 28;12:e82364. doi: 10.7554/eLife.82364. PMCID:PMC10110236 DOI: 10.7554/eLife.82364

6. Singh P, **Kapahi P**, van Deursen JM. Immune checkpoint inhibitors as senolytic agents. Cell Res. 2023 Mar;33(3):197-198. doi: 10.1038/s41422-022-00761-4. PMID: 36481795; PMCID: PMC9977720

7. Hilsabeck TAU, Liu-Bryan R, Guo T, Wilson KA, Bose N, Raftery D, Beck JN, Lang S, Jin K, Nelson CS, Oron T, Stoller M, Promislow D, Brem RB, Terkeltaub R, **Kapahi P**. A fly GWAS for purine metabolites identifies human FAM214 homolog medusa, which acts in a conserved manner to enhance hyperuricemia-driven pathologies by modulating purine metabolism and the inflammatory response. Geroscience. 2022 Aug;44(4):2195-2211. doi: 10.1007/s11357-022-00557-9. Epub 2022 Apr 6.PMID: 35381951

8. Rose J, Basisty N, Zee T, Wehrfritz C, Bose N, Desprez PY, **Kapahi P,** Stoller M, Schilling B. Comprehensive proteomic quantification of bladder stone progression in a cystinuric mouse model using data-independent acquisitions. PLoS One. 2022 June;17(6):e0250137. doi: 10.1371/journal.pone.0250137. eCollection 2022. PMCID: PMC9246204

9. Hodge BA, Meyerhof GT, Katewa SD, Lian T, Lau C, Bar S, Leung NY, Li M, Li-Kroeger D, Melov S, Schilling B, Montell C, **Kapahi P**. Dietary restriction and the transcription factor clock delay eye aging to extend lifespan in Drosophila Melanogaster. Nat Commun. 2022 June;13(1):3156. doi: 10.1038/s41467-022-30975-4. PMCID: PMC9174495

10. Hilsabeck TAU, Liu-Bryan R, Guo T, Wilson KA, Bose N, Raftery D, Beck JN, Lang S, Jin K, Nelson CS, Oron T, Stoller M, Promislow D, Brem RB, Terkeltaub R, **Kapahi P**. A fly GWAS for purine metabolites identifies human FAM214 homolog medusa, which acts in a conserved manner to enhance hyperuricemia-driven pathologies by modulating purine metabolism and the inflammatory response. Geroscience. 2022 April. doi: 10.1007/s11357-022-00557-9. PMCID: PMC9616999

11. Wilson KA, Bar S, **Kapahi P**. Ketones to the rescue of the starving fly. Nat Metab. 2022;4(2):159-60. PMCID:PMC8916092

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13. Wilson KA, Bar S, **Kapahi P**. Haste makes waste: The significance of translation fidelity for development and longevity. Mol Cell. 2021;81(18):3675-6. PMCID:PMC8840797

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16. Pandey M,Bansal S, Bar S,Kumar AY,Nicholas S Sokol NS,Tennessen JM,**Kapahi P**,Chawla G., miR-125-chinmo pathway regulates dietary restriction-dependent enhancement of lifespan in Drosophila Elife 2021 Jun 8;10:e62621. doi: 10.7554/eLife.62621 PMCID: PMC8233039

17. Khanna A, Sellegounder D, Kumar J, Chamoli M, Vargas M, **Kapahi, P**, Chinta SJ, et al. Trimethylamine modulates dauer formation, neurodegeneration, and lifespan through tyra-3/daf-11 signaling in Caenorhabditis elegans. Aging Cell. 2021;20(5):e13351. PMCID:PMC8135002

18. Evans DS, O'Leary MN, Murphy R, Schmidt M, Koenig K, Presley M, **Kapahi P**, al. Longitudinal Functional Study of Murine Aging: A Resource for Future Study Designs. JBMR Plus. 2021;5(3):e10466. PMCID:PMC7990142

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20. Sharma A, Akagi K, Pattavina B, Wilson KA, Nelson C, Watson M, **Kapahi P**, et al. Musashi expression in intestinal stem cells attenuates radiation-induced decline in intestinal permeability and survival in Drosophila. Sci Rep. 2020;10(1):19080. PMCID:PMC7644626

21. Jin K, Wilson KA, Beck JN, Nelson CS, Brownridge GW, 3rd, Harrison BR, **Kapahi P**, et al. Genetic and metabolomic architecture of variation in diet restriction-mediated lifespan extension in Drosophila. PLoS Genet. 2020;16(7):e1008835. PMCID:PMC7347105

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REVIEWS AND CHAPTERS

1. Durai Sellegounder, Parisa Zafari, Misagh Rajabinejad, Mahdi Taghadosi**, Pankaj Kapahi** (2021) Advanced glycation end products (AGEs) and its receptor, RAGE, modulate age-dependent COVID-19 morbidity and mortality. A review and hypothesis International Immunopharmacology, 2021 page 107806
2. Ramaswamy K, Killilea DW, **Kapahi P**, Kahn AJ, Chi T, Stoller ML. (2015) The elementome of calcium-based urinary stones and its role in urolithiasis. *Nat Rev Urol.* PMID:26334088
3. SD Katewa, A Khanna, **P Kapahi**. (2014) Mitobolites: The Elixir of Life. Cell metabolism 20 (1), 8-9
4. Miller J, Chi T, **Kapahi P**, Kahn AJ, Kim MS, Hirata T, Romero MF, Dow JA, Stoller ML. (2013) Drosophila melanogaster as an emerging translational model of human nephrolithiasis. *J Urol* 190:1648-56. PMC3842186
5. Khanna A, **Kapahi P**. Rapamycin: killing two birds with one stone. (2011) *Aging* (Albany NY). 2011 Nov;3(11):1043-4. PMID: 22170738 PMCID: PMC3249449
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7. Katewa SD, **Kapahi P**. (2011) Role of TOR signaling in aging and related biological processes in *Drosophila melanogaster*. *Exp Gerontol.* 2011 May 46(5)**:** 382-390 PMID: 21130151 PMCID: PMC3058120
8. Evans DS, **Kapahi P**, Hsueh WC, Kockel L. (2011) TOR signaling never gets old: aging, longevity and TORC1 activity. *Aging Res Rev.* 2011 Apr; 10(2)**:** 225-237 PMID: 20385253 PMCID: PMC2943975
9. Giebultowicz J, **Kapahi P**. (2010) Circadian Clocks and Metabolism: The Nutrient-Sensing AKT and TOR Pathways Make the Link. *Curr Biol.* 20(14):R608-R609. PMID: 20656206
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15. Kaeberlein M, **Kapahi P**. (2009) Cell signaling. Aging is RSKy business. *Science*. 326(5949):55-6. PMID: 19797648
16. Lucanic M, **Kapahi P**. (2009) Ubiquitin ligases join the field of dietary restriction in *C. elegans*. *Aging*. (Albany NY). 1(9):751-2. PMID: 20157562, PMCID: PMC2815732.
17. Kaeberlein M, **Kapahi P**. (2009) The hypoxic response and aging. *Cell Cycle*. **8**(15):2324. PMID: 19633411
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INVITED LECTURES

1. NIA Summer training course, Sep 2024
2. ARDD meeting, Copenhagen, August 2024
3. Diabetes Technology Society, August 2024
4. University of Alabama, Birmingham, Feb 2024
5. India EMBO meeting, Jun 2024
6. Global Aging Summit, Buck Institute, Dec 2023
7. American Aging Association, Oklahoma City, OK, June 2023
8. 5th Annual Age Related Disease Therapeutics Summit , May-June 2023
9. UCSF, Mar 2023
10. Global Longevity Federation, Dubai, UAE May 2023
11. CSHL Molecular Mechanisms of Aging Meeting, Cold Spring Harbor, September 2022
12. Bay Area Metabolism Meeting, Stanford University, September 2022
13. NIA Summer training course, Aug 2022
14. Genetic Variation and Aging, Seattle, WA, July 2022
15. Columbia University, Dec, 2019
16. NIA IRP Baltimore May, 2019
17. UC Davis, April, 2018
18. University of Wisconsin, *C. elegans* Stress and Aging, June, 2018

19. Bethesda, MD, NIH Stress and Aging, July, 2018
20. University of Texas, Oct 2017
21. Hillblom Foundation Meeting, Jan 2017
22. University of Virginia, Oct 2016
23. Sanford-Burnham Institute, San Diego, August 2016
24. Mount Desert Island Biological Laboratories, Aging Course lecture, June 2016
25. American Aging Association Meeting, Seattle, June 2016
26. Joslin Diabetes Center, May 2016
27. University of Pennsylvania, Philadelphia, March 2016
28. National Institute of Immunology, New Delhi November 2015
29. The University of California, Davis, October 2015
30. The University of Michigan, Ann Arbor, September 2015
31. Calico, San Francisco, July 2015
32. NIA Aging course, Buck Institute June 2015
33. American Aging Association meeting, Marina Del Rey, May 2015
34. Yale University, Endocrine Grand Rounds. April 2015
35. The University of Texas, San Antonio, Microbiome and aging conference. October 2014
36. University of California, San Francisco, Department of Hematology. July 2013
37. Children's Hospital Oakland Research Institute. August 2013
38. Sanford-Burnham Institute. April 2013
39. NIH Bethesda, Workshop on Circadian clocks. February 2013
40. Caloric Restriction Society, San Francisco. June 2012
41. Scripps Institute, Florida. December 2012
42. CSHL, Genetics of Aging meeting. October 2012
43. Stanford University, 'Frontiers in aging seminar series'. September 2012
44. University of California, San Francisco, CVRI. April 2012
45. University of Southern California, Andrus Gerontology Center. October 2011
46. The University of California, San Francisco, Department of Urology. July 2011
47. University of California, San Francisco, Endocrine Grand Rounds. May 2011
48. University of California, San Francisco, Department of Endocrinology. December 2010
49. University of Basel, Switzerland. December 2010
50. The University of Rochester, Department of Aging. December 2010
51. Cornell University, Department of Nutrition. December 2010
52. Gerontological Society of America, New Orleans, LA. November 2010
53. Nathan Shock Aging Center 2010 Conference on Aging, San Antonio, TX. October 2010.
54. National Institute of Aging workshop, Circadian Clocks and Their Role in Aging: Molecular Mechanisms, Bethesda, MD. June 2010.
55. University of Michigan, Ann Arbor, MI, Nathan Shock: Aging and TOR Signaling Conference. May 2010.
56. Keystone Symposium on aging, Tahoe, CA. March 2010.
57. University of California, Berkeley, Nutrition department. October 2009.
58. University of California, San Francisco, Neurosciences department. October 2009.
59. Buck Institute symposium on systems biology of aging. Buck Institute for Age Research. November 2009.
60. Ellison Foundation Colloquium on the Biology of Aging, Ellison Medical Foundation. 2009; Colloquium, Woods Hole, MA. August 2009.
61. NIA Summer Training Course in Experimental Aging Research. Buck Institute for Research on Aging. June 14-18 2009.
62. American Geriatric Society Symposium, American Aging Association 38th Annual Conference, Scottsdale, AZ. May 2009.
63. IPSEN Foundation conference, Salk Institute. January 2009.

64. The National Institute on Aging IRP Distinguished Lecturer in Neuroscience and Aging (Series). Baltimore, MD. December 16, 2008.
65. Sonoma State University Lifelong Education Class "21st Century Genetics," Buck Institute for Research on Aging. November 20, 2008.
66. Keystone Symposia on Molecular and Cellular Biology, Pathways of Longevity, Copper Mountain Resort, Copper Mountain, CO. March 3 – April 4, 2008.
67. Brain Diseases and Molecular Machines: Spotlights from Evolution, Development and Network Biology, Paris, France. March 25–28, 2008
68. Cold Spring Harbor Meeting on Genetics of Aging, Cold Spring Harbor. 2008.
69. The Gerontological Society of America, 60th Annual Scientific Meeting, The Era of Global Aging: Challenges and Opportunities. November 2007.
70. Nathan Shock Center Conference on Aging, Nutrients and Aging. San Antonio, TX. October, 2006.
71. NIA Summer Training Course in Experimental Aging Research. June 2006.
72. The University of Washington, Seattle, The Basic Biology of Aging Series. June 6, 2006.
73. 47th Drosophila Meeting, 2005.
74. 44th Drosophila Meeting, 2003.
75. Cold Spring Harbor Meeting on Genetics of Aging, Cold Spring Harbor. 2002.
76. 43rd Drosophila Meeting, 2002.
77. Gordon Research Conference on Free Radicals in Disease. Ventura, CA. February 2001.
78. Gordon Conference on Biology of Aging, Ventura, CA. February 2000. (awarded the poster prize)
79. Cold Spring Harbor Meeting on Genetics of Aging, Cold Spring Harbor. April 1998
80. Gordon Conference on Biology of Aging, Italy. May, 1998.
81. 4th Biomed Conference on Molecular Gerontology, Paris. November, 1997.

PATENTS

1.Podocarpic acid and derivatives thereof for treatment of diabetic complications (2016) (pending)
J. Chaudhuri, N Bose, P Kapahi
2.Lipoic acid and derivatives thereof for treatment of Cystinuria (2018)
Patent #:10052305
T Zee, M Stoller, P Kapahi
3.Modulators of Alpha-Dicarbonyl Detoxification and their use for the treatment of diabetic pathologies (2018 pending)
P. Kapahi, N. Bose, J. Chaudhuri
4.Methods for identifying and using IKK inhibitors (2008 pending)
M Karin, P Kapahi
5.Methods for identifying IKB Kinase (IKK) inhibitors (2008)
Patent # 7399606
M Karin, P Kapahi
6.Methods for identifying and using IKK inhibitors (2003)
Patent #6649654; Type: Grant
M Karin, P Kapahi

TRAINEES

Training Period	Trainee Name	Current Position of Past Trainees
2000-2005	Brian Zid	Assistant Professor, UCSD (Ph.D. student)
2004 –2006	Kally Pan	Ph.D., Columbia University (Research Assistant)

Training Period	Trainee Name	Current Position of Past Trainees
2005-2012	Di Chen	Assistant Professor, Nanjing University (Postdoc)
2005-06	Atsushi Yamaguchi	Assistant Professor, Chiba U, Japan (Postdoc)
2005-2011	Aric Rogers	Assistant Professor, MDI Biological Laboratory (Postdoc)
2006-2006	Julia Palter	Ph.D., UCSB (Research Assistant)
2007-2009	Ursula Edman	Scientist, Biotech Industry (Postdoc)
2007-2009	Ninguang Luo	MD (Postdoc)
2008-2011	Patrick Li	Scientist, Sangamo Biosciences (Postdoc)
2008-2010	Tom McCloskey	Scientist, U California-Berkeley (Postdoc)
2008-2012	Miguel Vargas	Scientist, Biotech industry (Ph.D. student)
2009-2017	Subhash Katewa	Research Assistant Professor, Buck Institute (Postdoc)
2009-2011	Tom Chi	Assistant Professor, UCSF (Postdoc)
2009-2013	Man Su Kim	Assistant Professor, College of Pharmacy, Inje University, Gimhae, Republic of Korea (Postdoc)
2009 -2014	Timothy Camarella	Scientist, Biotech industry (Masters student)
2010-present	Su Liu	Scientist Biomarin (post-doc)
2011 -2013	Nicole Naude	Clinical Laboratory Scientologist, Univ. Penn. (Masters student)
2011-2015	Matt Laye	Assistant Professor, College of Idaho (Postdoc)
2011-12	Marysia Kolipinski	Nurse Practitioner (Masters student)
2011 - 2013	Jennika Krisa	Sales Manager, Sepax Technologies (Masters student)
2011-2016	Kazutaka Akagi	Assistant Professor, National center for geriatrics and gerontology, Japan (Postdoc)
2011-2013	Nichole Bond	High school Teacher (Postdoc)
2011-2016	Guiping Du	Scientist, biotech (Postdoc)
2011-2015	Jitendra Kumar	Assistant Professor, (DBT-IPLS program) Patna University (Postdoc)
2012-2014	Sharon Epstein	Patent office lawyer, Buck Institute (Postdoc)
2012-2014	Hai Lu	Scientist, Biotech Industry (Masters student)
2012-2016	Sven Lang	Assistant Professor, Saarland University Faculty of Medicine Germany (postdoc)
2012-2016	Nuno Luis	Postdoc, Germany,(postdoc)
2012-2017	Amit Khanna	Scientist, Centrillion, (postdoc)
2012- 2015	Catherine Le	Scientist, Roche, (postdoc)
2012-2015	Gulnur Muteliefu	Scientist, Ultragenyx (Postdoc)
2013-2014	Sruthi Damodar	Scientist, Biotech Industry (Masters student)
2014-2016	Mauricio Ortega	Pharmacy student (Masters student)
2014-2016	Alex Rifkind	Started own company; law school (Postdoc)
2014- 2017	Mark Watson	Postdoc, Brand Lab (postdoc)

Training Period	Trainee Name	Current Position of Past Trainees
2015-2017	Jesse Simons	Research associate, Ellerby lab (Masters student)
2015-2017	Sana Khateeb	Research associate, Benz lab (Masters student)
2015-2017	See Yang	Scientist, Biotech industry (Postdoc)
2015-2020	Tanuja H. Peiris	Current Postdoc
2016- 2018	Sanjib Guha	Postdoc, Rutgers University
2014-2018	Jyotiska Chaudhari	Quality Operations, Baxter Int'l Inc.(Posdoc)
2014-2018	Neelanjan Bose	Eli Lily (Postdoc)
2013- 2017	Tiffany Zee	Regeneron (Postdoc)
2012-2019	Amit Sharma	Principal Investigator, SENS Foundation (Postdoc)
2012-present	Kenneth Wilson	Current Postdoctoral Fellow
2017-present	Tyler Hilsabeck	Current PhD student
2016-2018	Jessica Ramirez	Pharmacy school
2016-2018	Austin Lim	Research Associate, Buck Institute
2016-2018	Blaine Pattavina	Scientist, Biotech
2016-2022	Brian Hodge	Postdoc, Biotech Research
2017-2019	Geoffrey Meyerhof	Graduate student, UC Santa Barbara
2018-present	Sudipta Bar	Current postdoc
2018- 2020	Lukas Fluitt	Graduate student
2018- 2020	Lauren Winer	Graduate student
2018- 2020	George Brownbridge	Graduate student
2018-2022	Kristeen Pareja	Postdoc, Tracy Lab (Postdoc)
2019-present	Muniesh Muthaiyan Shanmugam	Postdoc, academia
2016-2022	Brian Hodge	Postdoc, Biotech Research
2021 - 2022	Amit Sahu	Pre-Doctoral Fellow
2021 - present	Kiyomi Kaneshiro	Current postdoc
2021 - present	Parminder Singh	Current Postdoctoral Fellow
2022 – present	Vikram Narayan	Assistant Professor
2021- 2023	Enrique Carrera	Graduate Student, Dominican University
2021 – present	Lizbeth Enriquez	Graduate Student, Dominican University
2022- present	Karishma Patel	Current Graduate student
2022 – present	Edgar Morazan	Current Graduate student
2023 – present	Lindsay Gann	Graduate Student, Dominican University
2023 – present	Worthy Gutierrez	Graduate Student, Dominican University
2023 – present	Yifan Xiang	Current Postdoctoral Fellow

Training Period	Trainee Name	Current Position of Past Trainees
2023 – present	Vineet Tanwar	Current Postdoctoral Fellow
2023 – present	Myla Gupta	Graduate Student, Dominican University
2024 – present	Faisal Ahmed	Graduate Student, Dominican University
2024 – present	Sonny Vang	Graduate Student, Dominican University
2024 – present	Dipti Verma	Current Postdoctoral Fellow
2024- present	Praveen Singh	Current Postdoctoral Fellow
2024- present	Johnathan Rylee	Current Postdoctoral Fellow

Mentoring underprivileged students

In addition to mentoring scientists I am also passionate about mentoring underprivileged students to narrow the economic gap in the world. Simply learning English and life skills that we take for granted can more than doubles their income opportunities. However, these kids do not have mentors to guide them. With the support of mentors around the world we are creating a network for these students to

help them realize their dreams. With the help of postdocs at the Buck I initiated a mentorship program which has now grown to over 400 mentors worldwide https://www.buckinstitute.org/news/kapahi-mentoring/.

REFERENCES

1. Dr. Marshall Stoller, UCSF
   Marshall.stoller@ucsf.edu

2. Dr. Anne Brunet, Stanford University.
   Abrunet1@stanford.edu

3. Dr. Gordon Lithgow, Buck Institute for Aging Research.
   Glithgow@buckinstitute.org

*Name of Individual: Kapahi, Pankaj
Commons ID: PANKAJKAPAHI

Other Support – Project/Proposal

ACTIVE

*Title: Advanced glycation endproducts (AGEs) as metabolic by-products that mediate neurodegeneration

*Major Goals: The aims of this project are: 1) Determining the impact of MGO and associated AGEs in mediating toxicity and neurodegeneration during normal aging and AD models in C. elegans. 2) Determining the function of lipid metabolism in enhancing neurodegeneration in AD models by modulating AGEs. 3) Determining the function of AGE-binding proteins in mediating neurodegeneration in AD models.

*Status of Support: ACTIVE

Project Number: 5 R01 AG 061165-05

Name of PD/PI: Kapahi, Pankaj

*Source of Support: NIH / NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 09/15/2019 – 05/31/2025 **NCE**

* Total Award Amount (including Indirect Costs): $3,258,055 (TC); $350,000 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
5. 2025	0.24 calendar

*Title: Larry L. Hillblom Center for Integrative Studies of Aging

*Major Goals: Provides support for labs located inside the Hillblom Center in the Gensler building at the Buck Institute for Research on Aging.

*Status of Support: ACTIVE

Project Number: N/A

Name of PD/PI: Lithgow, Gordon (PI); Kapahi, Pankaj (Co-Investigator)

*Source of Support: Larry L. Hillblom Foundation

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 02/01/2024 – 01/31/2025

* Total Award Amount (including Indirect Costs): $50,000 (TC/Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	0.00 calendar

*Title: Methylglyoxal drives astrocyte senescence to mediate neurodegeneration in Alzheimer's disease

*Major Goals: The goals of this project are: 1) Determine the mechanisms by which MGO drives senescence in human iPSC derived astrocytes. 2) Determine the mechanisms by which senescent astrocytes cause neuronal damage. 3) Determine the role of the Trpa1 pathway in modulating MGO induced senescence and AD pathology in mouse models.

*Status of Support: ACTIVE

Project Number: 5 R01 AG 068288-05

Name of PD/PI: Kapahi, Pankaj

*Source of Support: NIH / NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 08/01/2020 – 07/31/2025

* Total Award Amount (including Indirect Costs): $2,425,000 (TC); $250,000 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
5. 2025	3.36 calendar

*Title: Senescent cell mapping, identification and validation for human somatic and reproductive tissues

*Major Goals: The goals of the Biological Analysis Core Core within the TMC are to: 1) Determine the unique transcriptional signature of large senescent cells, 2) Determine senescent protein signatures, 3) Determine senescent transcriptional signatures of the breast, ovary and skeletal muscle and 4) Determine spatial relationship and frequencies of senescent cells in tissue sections.

The goals of the Administrative Core within the TMC are to: 1a) Organize regular and impromptu meetings among all Core leaders within the TMC itself, and internal management plans, 1b) Soliciting, selecting and administering of Pilot Projects for the TMC, 1c) Ensure administrative and fiscal compliance and communications with NIH, 2a) Facilitate collaborations within the TMC and overseeing goals and milestones, 3a) Implement collaborations with other TMCs and the CODCC and facilitate access to SenNet data, and 3b) Provide administrative help with travel for Core Leaders to attend overall SenNet Steering Committee meetings, and to engage in collaborative work

*Status of Support: ACTIVE

Project Number: 5 U54 AG 075932-04

Name of PD/PI: Schilling, Birgit (Contact PI); Melov, Simon (PI); Kapahi, Pankaj (Administrative Core and Biological Analysis Core Co-Lead)

*Source of Support: NIH / NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 09/30/2021 – 08/31/2026

* Total Award Amount (including Indirect Costs): $12,040,750 (TC); $265,504 (Admin Core Annual DC) $589,231 (Biological Analysis Core Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
4. 2025	1.56 calendar
5. 2026	1.56 calendar

*Title: Building Novel Geroscience Initiatives and Accelerating Translational Geroscience at the Buck Institute and Beyond

Major Goals: The purpose of this partnership is to translate the basic biology of aging to benefit human health and well-being. The Buck Institute's expertise in aging and its culture of collaboration, in partnership with Hevolution, has the potential to revolutionize biomedicine and dramatically better the human experience. The purpose is not to develop new therapies for specific diseases but instead to target aging itself which will result in broad gains in health in later life. The purpose is it help in translating the "geroscience hypothesis" to reality and bring health benefits to everyone. There are many challenges ahead; our partnership addresses three major hurdles: 1. Discovering new therapeutic interventions targeting aging: 2. Discovering new ways to measure aging and the effect of interventions and 3. Understanding the way in which the environment and our lifestyle influence aging and our health.

*Status of Support: ACTIVE

Project Number: N/A

Name of PD/PI: Verdin, Eric (PI); Kapahi, Pankaj (PI)

Source of Support: Hevolution Foundation U.S.

Primary Place of Performance: Buck Institute for Research on Aging

Project/Proposal Start and End Date: (MM/YYYY): 09/16/2023 – 08/31/2026

*Total Award Amount (including indirect costs) $21,000,000 (TC); $5,643,433 (Annual DC)

Year (YYYY)	Person Months (##_##)
1. 2025	0.60 calendar
2. 2026	0.60 calendar

*Title: Investigating the interplay between hallmarks of aging; protein glycation, nutrient sensing, and senescence

*Major Goals: The major goal of this project is: Role of methylglyoxal in inducing senescence in the pancreas and adipose tissues through protein glycation.

*Status of Support: ACTIVE

Project Number: 1 R56 AG 082819-01

Name of PD/PI: Kapahi, Pankaj (Contact PI); Aguayo-Mazzucato, Cristina (PI)

*Source of Support: NIH / NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 09/30/2023 – 08/31/2025 **NCE**

* Total Award Amount (including Indirect Costs): $444,220 (TC); $250,000 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	0.72 calendar

*Title: Investigating the interplay between hallmarks of aging; protein glycation, nutrient sensing, and senescence

*Major Goals: The major goal of this project are: 1) Investigate the direct role of methylglyoxal in regulating insulin synthesis and secretion. 2) Investigate the role of methylglyoxal in regulating glucose homeostasis and adipose-specific insulin resistance. 3) Investigate the interplay between MGO-induced protein glycation, insulin resistance, and cellular senescence.

*Status of Support: ACTIVE

Project Number: HF-GRO-23-1199138

Name of PD/PI: Kapahi, Pankaj (Contact PI), Desprez, Pierre-Yves (PI)

*Source of Support: Hevolution Foundation

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 04/01/2024 – 03/31/2028

* Total Award Amount (including Indirect Costs): $1,977,252 (TC); $395,450 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	1.20 calendar
2. 2026	1.20 calendar
3. 2027	1.20 calendar
4. 2028	1.20 calendar

*Title: The role of diet and aging photoreceptor homeostasis and visual function decline

*Major Goals: The major goals of this project are to 1) determine the downstream effectors of the core circadian clock gene, *clk*, that alter age-related decline in vision upon modulation of diet and light. 2) Determine the diet-dependent transcriptional regulators of rhythmic phototransduction genes and their impact on age-related changes in the visual system function. 3) Determine the influence of genes involved in modulating age-related changes in fundus imaging in humans on photoreceptor homeostasis using *D. melanogaster.*

*Status of Support: ACTIVE

Project Number: 1 R01 AG 071995-01A1

Name of PD/PI: Kapahi, Pankaj

*Source of Support: NIH / NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 07/01/2024 – 05/31/2029

* Total Award Amount (including Indirect Costs): $3,727,090 (TC); $384,236 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	3.00 calendar
2. 2026	3.00 calendar
3. 2027	3.00 calendar

Year (YYYY)	Person Months (##.##)
4. 2028	3.00 calendar
5. 2029	3.00 calendar

PENDING

*Title: Personalized Analytics for Transforming Healthcare (PATH): A PATH Toward Proactive Health

*Major Goals: While “omic” technologies are enabling the generation of human health data, these are often siloed without sufficient context, constraining interpretation for biological meaning and clinical actionability. Recent leaps forward by generative AI have been made possible by two major factors: significant advancements in compute power and amassing vast training data. In biology and medicine these training data are still limited. A major goal of this project is to generate and contextualize the data necessary for implementing these approaches to usher in the new age of Proactive Health.

*Status of Support: PENDING

Project Number: N/A

Name of PD/PI: Hood, Lee (PI); Kapahi, Pankaj (Task Leader 1.2)

*Source of Support: ARPA-H

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 10/01/2024 – 09/30/2028

* Total Award Amount (including Indirect Costs): $61,612,214 (TC); $6,723,650 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	0.60 calendar
2. 2026	0.60 calendar
3. 2027	0.60 calendar
4. 2028	0.60 calendar

*Title: The Role of OXR1 and the retromer in aging and Alzheimer’s disease

*Major Goals: The major goals of this project are to: 1) define the role of specific retromer components and downstream targets of OXR1 in lifespan and brain aging in control flies. 2) Define the role of specific retromer components and downstream targets of OXR1 in neurodegeneration in fly models of ADRD. 3) Determine if overexpression of OXR1 enhances retromer function to slow the onset of neurodegeneration in human iPSc AD models.

*Status of Support: PENDING

Project Number: 1 R01 AG 087580-01A1

Name of PD/PI: Kapahi, Pankaj (Contact PI); Ellerby, Lisa (PI)

*Source of Support: NIA / NIH

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 09/01/2024 – 08/31/2029

* Total Award Amount (including Indirect Costs): $4,833,975 (TC); $498,348 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2025	3.00 calendar
2. 2026	3.00 calendar
3. 2027	3.00 calendar
4. 2028	3.00 calendar
5. 2029	3.00 calendar

*Title: Nutritional Supplement in Postmenopausal Women with Overweight or Obesity

*Major Goals: The main goals of this project are to determine if a GRAS (Generally Regarded As Safe) glycation lowering, non-pharmacological, multimodal therapeutic (GLYLO) will reduce insulin resistance, enhance neuromuscular function, lower follicle stimulating hormone and extend lifespan in postmenopausal females with overweight or obesity. We will explore GLYLO's impact on longevity with groundbreaking retina imaging technology, which offers a cost-effective, yet robust and accurate assessment of aging (eyeAge).

*Status of Support: PENDING

Project Number: PA-23-231

Name of PD/PI:

*Source of Support: Hoskinson's Health and Wellness Clinic / NIH

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 12/01/2024 – 11/30/2025

* Total Award Amount (including Indirect Costs): $31,541 (TC); $16,258 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2024	0.12 calendar

*Title: Buck Institute Nathan Shock Center

Major Goals: The major goals of this project are to: The proposed Buck Institute Nathan Shock Center (BINSC) we will provide first-class scientific resources to the Nation to propel the basic biology of aging field toward radical human health improvement.

*Status of Support: PENDING

Project Number: 1 P30 AG 092763-01

Name of PD/PI: Lithgow, Gordon (Contact), Hansen, Malene (PI), Webb, Ashley (PI), Kapahi, Pankaj (APC Core Leader)

*Source of Support: NIH/NIA

*Primary Place of Performance: Buck Institute for Research on Aging

Project/Proposal Start and End Date: (MM/YYYY) (if available): 06/01/2025-05/31/2030

* Total Award Amount (including Indirect Costs): $ 10,670,000(TC); $1,100,000 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months
1. 2026	1.20 calendar
2. 2027	1.20 calendar
3. 2028	1.20 calendar
4. 2029	1.20 calendar
5. 2030	1.20 calendar

*Title: Summer Training Course in Experimental Aging

*Major Goals: Aging is a major challenge in biomedicine and the largest single risk factor for several diseases, including cancer, cardiovascular disease, osteoporosis, type II diabetes, and neurodegeneration. With the aging U.S. population, there is a critical need to train researchers to address problems relevant to the biology of aging and age-related diseases. The Summer Training Course in Experimental Aging Research aims to meet this need by providing 20 early-career researchers or senior researchers transitioning to aging research with intensive exposure to key questions in the field, along with personalized critiques and advice on their research plans each year.

*Status of Support: PENDING

Project Number: 2 R13 AG 059431-07

Name of PD/PI: Kapahi, Pankaj

*Source of Support: NIH/NIA

*Primary Place of Performance: The Buck Institute for Research on Aging

Project/Proposal Start and End Date: 05/01/2018 – 03/31/2030

* Total Award Amount (including Indirect Costs): $499,850 (TC); $101,085 (Annual DC)

* Person Months (Calendar/Academic/Summer) per budget period.

Year (YYYY)	Person Months (##.##)
1. 2026	0.25 calendar
2. 2027	0.25 calendar
3. 2028	0.25 calendar
4. 2029	0.25 calendar
5. 2030	0.25 calendar