

# BÉRÉNICE A. BENAYOUN, PH.D.

Assistant Professor of Gerontology, Biological Sciences, Biochemistry and Molecular Medicine

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## **EDUCATION**

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2007-2011 Ph.D. in Genetics and Cell Biology, Paris Diderot University, École doctorale GC2ID, Paris, France.  
2009 Diploma from the École Normale Supérieure (Biology major), France.  
2005-2007 M.Sc. in Genetics École Normale Supérieure/Université Paris 7, France.  
2005 B.Sc. in Biology, École Normale Supérieure, Université Paris 7, France.  
2004-2008 École Normale Supérieure (ENS), Biology Department, Paris, France.

## **PROFESSIONAL EXPERIENCE**

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2021-present Biochemistry and Molecular Medicine Department, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA.  
2020-present Molecular and Computational Biology Department, Dana and David Dornsife College of Letters, Arts and Sciences, University of Southern California, Los Angeles, CA, USA.  
2018-present Full member, Genetic and Epigenetic Regulation Program, USC Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA, USA.  
2018-present USC Neuroscience Graduate Program, University of Southern California, Los Angeles, CA, USA.  
2017-present USC Stem Cell initiative PI, University of Southern California, Los Angeles, CA, USA.  
2017-present Assistant Professor of Gerontology, Leonard Davis School of Gerontology, University of Southern California, Los Angeles, CA, USA.  
2011-2017 Post-doctoral fellow, Department of Genetics, Stanford University School of Medicine, CA, USA.  
2007-2011 Graduate student, Department of Molecular and Cellular pathology, Institut Jacques Monod, CNRS UMR7592, Paris, France.  
2007 Visiting student, Department of Genetics and Development, Institut Cochin, INSERM U567, CNRS UMR8104, Paris, France.  
2006 Visiting student, University of California at Berkeley, CA, USA.  
2005 Visiting student, Northwestern University, Evanston, IL, USA.

## **ACADEMIC AND PROFESSIONAL HONORS**

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2021 Nathan Shock New Investigator award (awarded by the Gerontology Society of America)  
2020 Kathleen Gilmore Award in Aging Research  
2020 Glenn and AFAR Junior Faculty Award  
2020 GCRLE Junior Scholar Award  
2020 Pew Biomedical Scholar Award  
2019 Rosalind Franklin Young Investigator Award in Mammalian Genetics  
2019 Publons Peer Review Awards, Top 1% reviewers in Molecular Biology and Genetics  
2019 Glenn and AFAR Junior Faculty Award (*Declined*)  
2019 Sigma Xi, Scientific Research Honor Society, full membership

2019	Rose Hills Foundation Innovator Grant Award
2019	NAVIGAGE Award
2018	Publons Peer Review Awards, Top 1% reviewers in field
2018	Hanson-Thorell family scholarship
2015	Regeneron Prize for Creative Innovation for a post-doctoral fellow, honorable mention
2014	NIH/NIA Pathway to Independence Award (K99/R00)
2013	Stanford University School of Medicine Dean's postdoctoral fellowship
2011	Ph.D. <i>summa cum laude</i> with highest distinction, Paris Diderot-Paris7 University
2008-2011	Ph.D. fellowship from the Research and National Education Institute/Paris 7 University
2007	M.Sc. <i>summa cum laude</i> (ranked first), Ecole Normale Supérieure/Paris Diderot-Paris7 University
2005	Research fellowship from the Rice Institute of Biomedical Research
2004-2008	Student fellowship from the École Normale Supérieure of Paris

## **SERVICE TO SCIENCE**

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### ***Manuscript reviewing activities***

2011-present *Ad hoc* manuscript reviewer for *Cell*, *Science*, *eLife*, *PNAS*, *Genome Research*, *Nature Aging*, *Nature Communications*, *Nature Genetics*, *Nature Medicine*, *Nature Metabolism*, *Cell reports*, *Genome Biology*, *PLoS Computational Biology*, *Bioinformatics*, *Aging Cell*, *Journal of Gerontology Biological Sciences*, *Aging*, *BMC Biology*, *Genome Biology*, *Immunity*, etc.  
 Verified Reviewer Publons profile: <https://publons.com/a/1446811/>

### ***Grant/fellowship reviewing activities***

2022 Reviewer for AFAR/ Glenn Foundation for Medical Research Postdoctoral Fellowships in Aging Research  
 2022 *Ad hoc* reviewer for University of Washington MDI, DRC and NORC pilot grant program  
 2022 USC internal reviewer for Packard fellowships applications  
 2022 *Ad hoc* Novo Nordisk Foundation grant reviewer  
 2021 NIH/NIA AGCD-1 *ad hoc* study section member  
 2021 *Ad hoc* grant reviewer for San Antonio Nathan Shock Center pilot grant program  
 2021 *Ad hoc* grant reviewer for Inspire Geroscience Projects (Toulouse, France)  
 2021 National Science Foundation (NSF) Reviewer  
 2020, 2021, 2022 USC internal reviewer for Pew Biomedical Scholar applications  
 2020 *Ad hoc* grant reviewer for Yale University Pepper Center pilot grant program  
 2019-present European Science Foundation (ESF), College of Expert Reviewers member  
 2019 *Ad hoc* grant reviewer for LA Biomed  
 2019 *Ad hoc* grant reviewer for Biotechnology and Biological Sciences Research Council (BBSRC) (UK)  
 2017 *Ad hoc* grant reviewer for Estonian Research Council (Estonia)  
 2017 *Ad hoc* grant reviewer for Instituto Serrapilheira (Brazil)

### ***Abstract reviewing activities***

2022 Abstract reviewer for the Gerontological Society of America (GSA) 2022 Annual Scientific Meeting  
 2021 Abstract reviewer for the 3<sup>rd</sup> Systems Biology of Aging Meeting at JAX  
 2020 Abstract reviewer for the 2<sup>nd</sup> Systems Biology of Aging Meeting at JAX  
 2019 Abstract reviewer for the Gerontological Society of America (GSA) 2019 Annual Scientific Meeting  
 2019 Abstract reviewer for the 1<sup>st</sup> Systems Biology of Aging Meeting at JAX

### ***Scientific editing activities***

2021-present Board of Reviewing Editors, *eLife*  
 2021 Guest reviewing Editor, *eLife*  
 2021-present Editorial Board member, Journals of Gerontology series A: Biological Sciences

2019-present Associate Editor, Translational Medicine of Aging  
2019-2021 Reviewing Editor, Frontiers in Aging Neurosciences  
2019 Co-Guest Editor (Special Issue on “Aging and Longevity”), Human Genetics

### **Conference organization activities**

2022 Co-organizer, 4<sup>th</sup> Systems Immunology in Aging meeting, JAX-GM, Farmington, CT, USA  
2022 International Scientific Advisory Board, Neutrophil 2022 meeting  
2021 Co-organizer, 3<sup>rd</sup> Systems Immunology in Aging meeting, JAX-GM, *Virtual Event*  
2020 Co-organizer, 2<sup>nd</sup> Systems Immunology in Aging and Chronic Diseases of Aging, JAX-GM, *Virtual Event*  
2019 Co-organizer, 1<sup>st</sup> Systems Biology of Aging meeting: Data Science Meets Geroscience, JAX-GM, Farmington, CT, USA

### **Professional society activities**

2021-present Nathan Shock Centers Communications Committee (2022-present: Chair)  
2020-present Membership committee, American Aging Association (AGE)

## **PUBLICATIONS**

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H-index: 28 (Web of Science, 08/05/2022); 31 (Google Scholar, 08/05/2022)  
Mean/Weighted RCR: 2.58/121.29 (iCite, 08/05/2022)  
Total times cited: 3,108 (Web of Science, 08/05/2022); 4,663 (Google Scholar, 08/05/2022)

### **Preprints**

1. Morrow CS, Arndt ZP, Peng B, Zewdie EY, **Benayoun BA** & Moore DL. Cell-state specific aggresome formation in fibroblasts is driven by stress-activated MAPK signaling (2021). *BioRxiv preprint*, doi: 10.1101/2021.07.23.453501
2. Iriando O, Mecnas D, Li Y, Chin CR, Thomas A, Amzaleg Y, Ortiz V, MacKay M, Dickerson A, Lee G, Harotoonian S, **Benayoun BA**, Smith AD, Mason C & Yu M. Hypoxic memory of tumor intrinsic type I interferon suppression promotes breast cancer metastasis (2022). *BioRxiv preprint*, doi:10.1101/2022.05.12.491632
3. Chung C, Verheijen BM, Zhang X, Huang B, Coakley A, McGann E, Wade E, Dinep-Schneider O, LaGosh J, Anagnostou M, Simpson S, Thomas K, Ernst JM, Rattray A, Lynch M, Kashlev M, **Benayoun BA**, Li Z, Strathern J, Gout JF & Vermulst M. The fidelity of transcription in human cells (2022). *BioRxiv preprint*, doi:10.1101/2022.05.10.491385

### **Original research articles**

1. Teefy BB, Adler A, Bhala R & **Benayoun BA**. Gentle Isolation of Nuclei from the Brain Tissue of Adult African Turquoise Killifish, a Naturally Short-Lived Model for Aging Research (2022). *J. Vis. Exp.*, **180**, e64165, doi: 10.3791/64165
2. Kim M, Lu RJ & **Benayoun BA**. Single-cell RNA-seq of primary bone marrow neutrophils from female and male adult mice (2022). *Scientific Data*, **9**, 442.
3. Taylor S, Isobe S, Cao A, Contrepolis K, **Benayoun BA**, Jiang L, Wang L, Melemenidis S, Ozen MO, Otsuki S, Shinohara T, Sweatt AJ, Kaplan J, Moonen JR, Marciano DP, Gu M, Miyagawa K, Hayes B, Sierra RG, Kupitz CJ, Del Rosario PA, Hsi A, Thompson AAR, Ariza ME, Demirci U, Zamanian RT, Haddad F, Nicolls MR, Snyder MP & Rabinovitch M. Endogenous Retroviral Elements Generate Pathologic Neutrophils in Pulmonary Arterial Hypertension (2022). *Am J Respir Crit Care Med*, doi: 10.1164/rccm.202102-0446OC
4. McGill CJ, Lu RJ & **Benayoun BA**. Protocol for analysis of mouse neutrophil NETosis by flow cytometry (2021). *STAR protoc*, **2**, 100948.
5. Guerrero GA, Derisbourg MJ, Wester LE, Gordia M, Dinort JE, Alonso MJ, Hartman MD, Schilling K, Mayr FAMC, Lu RJ, **Benayoun BA** & Denzel MS. NHR-8 regulated P-glycoproteins uncouple xenobiotic stress resistance from longevity in chemosensory *C. elegans* mutants (2021). *eLife*, **10**, e53174.

6. Lu RJ, Taylor S, Contrepois K, Kim M, Bravo JI, Ellenberger M, Sampathkumar NK & **Benayoun BA**. Multi-omic profiling of primary mouse neutrophils predicts a pattern of sex and age-related functional regulation (2021). *Nature Aging*, **1**, 715-733.
7. Bravo JI, Kim M & **Benayoun BA**. Protocol for isolation of adult mouse ear pinnae-derived primary fibroblasts (2021). *STAR protoc*, **2**, 100406.
8. Reynolds J, Lai RW, Woodhead JST, Joly JH, Mitchell CJ, Cameron-Smith D, Lu R, Cohen P, Graham NA, **Benayoun BA**, Merry TL & Lee C. MOTS-c is an Exercise-Induced Mitochondrial-Encoded Regulator of Age-Dependent Physical Decline and Muscle Homeostasis (2020). *Nat Comms*, **12**, 470.
9. Fritsch C, Gout JF, Haroon S, Towheed A, Chung C, LaGosh J, McGann E, Zhang X, Song Y, Simpson S, Danthi PS, **Benayoun BA**, Wallace DC, Thomas WK, Lynch M & Vermulst M. Genome-wide surveillance of transcription errors in response to genotoxic stress (2021). *PNAS*, **118**, e2004077118.
10. Chen Y\*, Bravo JI\*, Son JM, Lee C & **Benayoun BA**. Remodeling of the H3 nucleosomal landscape during mouse aging (2020). *Transl Med Aging*, **4**, 22-31.
11. Mahmoudi S, Mancini E, Moore A, Xu L, Jahanbani F, Hebestreit K, Srinivasan R, Li X, Devarajan K, Prélôt L, Ang CE, Shibuya Y, **Benayoun BA**, Chang ALS, Wernig M, Wysocka J, Longaker MT, Snyder MP & Brunet A. Heterogeneity in old fibroblasts is linked to variability in reprogramming and wound healing (2019). *Nature*, **574**, 553-558.
12. **Benayoun BA\***, Pollina E, Singh PP, Mahmoudi S, Harel I, Casey K, Dulken B, Kundaje A & Brunet A\*. Remodeling of epigenome and transcriptome landscapes with aging in mice reveals widespread induction of inflammatory responses (2019). *Genome Res*, **29**, 697-709. \*co-corresponding authors
13. Kim, KH, Son JM, **Benayoun BA**, and Lee C. The Mitochondrial-Encoded Peptide MOTS-c Translocates to the Nucleus to Regulate Nuclear Gene Expression in Response to Metabolic Stress (2018). *Cell Metab*, **28**, 516-524.
14. Contrepois K\*, Coudereau C\*, **Benayoun BA**, Schuler N, Roux PF, Bischof O, Courbeyrette R, Carvalho C, Thuret JY, Ma Z, Derbois C, Nevers MC, Volland H, Redon C, Bonner W, Deleuze JF, Wiel C, Bernard D, Snyder MP, Rube C, Olaso R, Fenaille F & Mann C. Histone variant H2A.J accumulates in senescent cells and promotes inflammatory gene expression (2017). *Nat Comms*, **14995**, 10.1038/ncomms14995
15. Kurum E, **Benayoun BA**, Malhotra A, George J & Ucar D. Computational inference of a genomic pluripotency signature in human and mouse stem cells (2016). *Biol Direct*, **11**, 47, 10.1186/s13062-016-0148-z.
16. Valenzano D\*, **Benayoun BA\***, Singh PP\*, Zhang E, Etter PD, Hu CK, Clément-Ziza M, Willemsen D, Cui R, Harel I, Machado B, Lee MC, Sharp SC, Bustamente C, Beyer A, Johnson EA & Brunet A. The African Turquoise Killifish Genome Provides Insights into Evolution and Genetic Architecture of Lifespan (2015). *Cell*, **163**, 1539-1554. \*equal contribution
17. Schaffer BE, Levin RS, Hertz NT, Maures TJ, Schoof ML, Hollstein PE, **Benayoun BA**, Banko MR, Shaw RJ, Shokat KM & Brunet A. Identification of AMPK Phosphorylation Sites Reveals a Network of Proteins Involved in Cell Invasion and Facilitates Large-Scale Substrate Prediction (2015). *Cell Metab*, **22**, 907-921.
18. Pech MF, Garbuzov A, Hasegawa K, Sukhwani M, Zhang RJ, **Benayoun BA**, Brockman SA, Lin S, Brunet A, Orwig KE & Artandi SE. High telomerase is a hallmark of undifferentiated spermatogonia and is required for maintenance of male germline stem cells (2015). *Genes Dev*, **29**, 1-15.
19. Harel I, **Benayoun BA**, Machado B, Singh PP, Hu CK, Pech MF, Zhang E, Fullhart SC, Artandi SE & Brunet A. Rapid exploration of aging and disease-related genes in a naturally short-lived vertebrate (2015). *Cell*, **160**, 1013-1026.
20. Kareta MS, Gorges LL, Hafeez S, **Benayoun BA**, Zmoos AF, Cecchini MJ, Spacek D, Batista LFZ, O'Brien M, Ng YH, Ang CE, Vaka D, Artandi SE, Dick FA, Brunet A, Sage J & Wernig M. Inhibition of Pluripotency Networks by the Rb Tumor Suppressor Restricts Reprogramming and Tumorigenesis (2014). *Cell Stem Cell*, **16**, 39-50.
21. **Benayoun BA\***, Pollina EA\*, Uçar D\*, Wong ED, Mancini E, Mahmoudi S, Hitz BC, Devarajan K, Gupta R, Rando TA, Baker JC, Snyder MP, Cherry JM & Brunet A. H3K4me3 breadth is linked to cell identity and transcriptional consistency (2014). *Cell*, **158**, 673-688. (Correction: *Cell*, 2015, **163**, 1281-1286.) \*equal contribution.

22. Maures TJ, Booth L, **Benayoun BA**, Izrayelit Y, Schroeder F & Brunet A. Males shorten the lifespan of *C. elegans* hermaphrodites via secreted compounds (2014). *Science*, **343**, 541-544.
23. **Benayoun BA\***, Anttonen M\*, L'hôte D, Bailly-Bechet M, Andersson N, Heikinheimo M & Veitia RA. Adult ovarian granulosa cell tumor transcriptomics: prevalence of FOXL2 target genes misregulation gives insights into the pathogenic mechanism of the p.Cys134Trp somatic mutation (2013). *Oncogene*, **32**, 2739-2746. \*equal contribution
24. L'Hôte D, Georges A, Todeschini AL, Kim JH, **Benayoun BA**, Bae J & Veitia RA. Discovery of novel protein partners of the transcription factor FOXL2 provides insights into its physiopathological roles (2012). *Hum Mol Genet*, **21**, 3264-3274.
25. Georges AB, **Benayoun BA**, Marongiu M, Dipietromaria A, L'hôte D, Todeschini AL, Auer J, Crisponi L & Veitia RA. SUMOylation of the Forkhead transcription factor FOXL2 promotes its stabilization/activation through transient recruitment to PML bodies (2011). *PLoS ONE*, **6**, e25463.
26. Greer EL, Maures TJ, Ucar D, Hauswirth A, Mancini E, Lim J, **Benayoun BA**, Shi Y & Brunet A. Transgenerational Epigenetic Inheritance of Longevity in *C. elegans* (2011). *Nature*, **479**, 365-371.
27. Lelièvre EC, **Benayoun BA**, Mahieu L, Roger JE, Sahel JA, Sennlaub F, Veitia RA, Goureau O & Guillonneau X. A Regulatory Domain Is Required for Foxn4 Activity During Retinogenesis (2011). *J Mol Neuroscience*, **46**, 315-323.
28. **Benayoun BA**, Georges AB, L'Hôte D, Andersson N, Dipietromaria A, Todeschini AL, Caburet S, Bazin C, Anttonen M & Veitia RA. Transcription factor FOXL2 protects granulosa cells from stress and delays cell cycle: role of its regulation by the SIRT1 deacetylase (2011). *Hum Mol Genet*, **20**, 1673-1686.
29. **Benayoun BA\***, Caburet S\*, Dipietromaria A, Georges AB, D'Haene B, Pandaranayaka PJE, L'Hôte D, Todeschini AL, Krishnaswamy S, Fellous M, De Baere E & Veitia RA. Functional exploration of the adult ovarian granulosa cell tumor-associated somatic FOXL2 mutation p.Cys134Trp (c.402C>G) (2010). *PLoS ONE*, **5**, e8789. \*equal contribution
30. Dipietromaria A, **Benayoun BA**, Todeschini AL, Rivals I, Bazin C & Veitia RA. Towards a functional classification of pathogenic FOXL2 mutations using transactivation reporter systems (2009). *Hum Mol Genet*, **18**, 3324-3333.
31. Laissue P, Lakhal B, **Benayoun BA**, Dipietromaria A, Braham R, Elghezal H, Philibert P, Saâd A, Sultan C, Fellous M & Veitia RA. Functional evidence implicating FOXL2 in non-syndromic premature ovarian failure and in the regulation of the transcription factor OSR2 (2009). *J Med Genet*, **46**, 455-457.
32. **Benayoun BA**, Batista F, Auer J, Dipietromaria A, L'hôte D, De Baere E & Veitia RA. Positive and negative feedback regulates the transcription factor FOXL2 in response to cell stress: evidence for a regulatory imbalance induced by disease-causing mutations (2009). *Hum Mol Genet*, **18**, 632-644.
33. **Benayoun BA\***, Caburet S\*, Dipietromaria A\*, Bailly-Bechet M, Batista F, Fellous M, Vaiman D & Veitia RA. The identification and characterization of a FOXL2 response element provides insights into the pathogenesis of mutant alleles (2008). *Hum Mol Genet*, **17**, 3118-3127. \*equal contribution
34. **Benayoun BA**, Auer J, Caburet S & Veitia RA. The post-translational modification profile of the forkhead transcription factor FOXL2 suggests the existence of parallel processive modification pathways (2008). *Proteomics*, **8**, 3118-3123.
35. Nallathambi J, Laissue P, Batista F, **Benayoun BA**, Lesaffre C, Moumné L, Pandaranayaka PJE, Usha K, Krishnaswamy S, Sundaresan P & Veitia RA. Differential Functional Effects of Novel Mutations of the Transcription Factor FOXL2 in BPES Patients (2008). *Hum Mutat*, **29**, E123-E131.

### Review articles

1. Chen Y, Kim M, Paye S & **Benayoun BA**. Sex as a biological variable in nutrition research: from human studies to animal models (2022), *Annu Rev Nutr*, **42**, doi: 10.1146/annurev-nutr-062220-105852.
2. McGill CJ & **Benayoun BA**. Time isn't kind to female T-cells (2022), *Nat Aging*, **2**, 189–191.
3. Lu RJ, Wang EK & **Benayoun BA**. Functional genomics of inflamm-aging and immunosenescence (2021), *Briefings in Functional Genomics*, elab009.
4. Kim M & **Benayoun BA**. A multiomic atlas for the exploration of healthy aging in human monocytes (2021), *Nat Aging*, **1**, 19-21.

5. Kim M & **Benayoun BA**. The microbiome: an emerging key player in aging and longevity (2020). *Transl Med Aging*, **4**, 103-116.
6. **Benayoun BA** & Veitia RA. Special issue on “Molecular genetics of aging and longevity”: a critical time in the field of geroscience (2020). *Human Genetics*, **139**, 275-276.
7. Bravo JI, Nozownik S, Danthi PS & **Benayoun BA**. Transposable elements, circular RNAs and mitochondrial transcription in age-related genomic regulation (2020). *Development*, **147**, dev175786.
8. Sampathkumar NK, Bravo JI, Chen Y, Danthi PS, Donahue EK, Lai RW, Lu R, Randall LT, Vinson N & **Benayoun BA**. Widespread sex-dimorphism in aging and age-related diseases (2020). *Hum Genet*, **139**, 333-356.
9. **Benayoun BA** & Lee C. MOTS-c: A Mitochondrial-Encoded Regulator of the Nucleus (2019). *BioEssays*, **41**, e1900046.
10. Lai RW, Lu R, Danthi PS, Bravo JI, Goumba A, Sampathkumar NK & **Benayoun BA**. Multi-level remodeling of transcriptional landscapes in aging and longevity (2019). *BMB rep*, **52**, 86-108.
11. **Benayoun BA\***, Pollina EA\* & Brunet A. Epigenetic regulation of ageing: linking environmental inputs to genomic stability (2015). *Nat Rev Mol Cell Biol*, **16**, 593-610. \*equal contribution
12. **Benayoun BA** & Brunet A. Epigenetic Memory of longevity in *Caenorhabditis elegans* (2012). *Worm*, **1**, 77-81.
13. Yusuf D, Butland SL, [...], **Benayoun BA**, [...] & Wasserman WW. The Transcription Factor Encyclopedia (2012). *Genome Biology*, **13**, R24.
14. Caburet S, Georges A, L’Hôte D, Todeschini AL, **Benayoun BA** & Veitia RA. The transcription factor FOXL2: At the crossroads of ovarian physiology and pathology (2012). *Mol Cell Endocrinol*, **356**, 55-64.
15. **Benayoun BA**, Caburet S & Veitia RA. Forkhead transcription factors: key players in health and disease (2011). *Trends Genet*, **27**, 224-232.
16. Georges AB, **Benayoun BA**, Caburet S & Veitia RA. Generic binding sites, generic DNA binding domains: where does specific promoter recognition comes from? (2010). *FASEB Journal*, **24**, 346-356.
17. **Benayoun BA**, Kalfa N, Sultan C & Veitia RA. The Forkhead transcription factor FOXL2: a novel tumor suppressor gene? (2010). *BBA rev Cancer*, **1805**, 1-5.
18. Kalfa N, Veitia RA, **Benayoun BA**, Boizet-Bonhoure B & Sultan C. The new molecular biology of granulosa cell tumors of the ovary (2009), *Genome Medicine*, **1**, 81.
19. **Benayoun BA** & Veitia RA. A post-translational modification code for transcription factors: sorting through a sea of signals (2009). *Trends Cell Biol*, **19**, 189-197.
20. Moumné L, Batista F, **Benayoun BA**, Nallathambi J, Fellous M, Sundaresan P & Veitia RA. The mutations and potential targets of the forkhead transcription factor FOXL2 (2008). *Mol Cell Endocrinol*, **282**, 2-11.

### Book chapters

1. Lu R\*, Sampathkumar NK\* & **Benayoun BA**. Measuring Phagocytosis in Bone Marrow-Derived Macrophages and Peritoneal Macrophages with Aging (2020). *Methods Mol Biol*, **2144**, 161-170, supervised by S.P. Curran, Springer.
2. Duygu Ucar & **Benayoun BA**. Aging epigenetics: changes and challenges, *in* Epigenetics of Aging and Longevity (2018), supervised by Moskalev & Vaiserman, Elsevier.
3. **Benayoun BA**, Dipietromaria A, Bazin C & Veitia RA. FOXL2: at the crossroads of female sex determination and ovarian function. Section IV: Translating vital cellular mechanisms into successful clinical care, *in* Forkhead Transcription Factors: Vital Elements in Biology and Medicine (2010), supervised by K. Maise, Landes Biosciences.

### TALKS

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| 2022 | 1 <sup>st</sup> FASEB Reproductive Aging Conference, Palm Springs, CA, USA ( <i>Invited speaker</i> )              |
| 2022 | Microbiology and Immunology Seminar, University at Buffalo, Buffalo, NY, USA ( <i>Invited speaker</i> )            |
| 2022 | 50 <sup>th</sup> Annual Meeting of the American Aging Association, San Antonio, TX, USA ( <i>Invited speaker</i> ) |
| 2022 | Center for Reproductive Science [CRS] summit, Northwestern University, Chicago, IL, USA ( <i>Invited speaker</i> ) |

- 2022 Immunology 2022, Portland, OR, USA [Major symposium: Sex-differences in the immune response] (*Invited speaker*)
- 2022 ASBMB/EB annual meeting, Philadelphia, PA, USA (*Invited speaker*)
- 2022 I3T Seminar Series, University of California at Los Angeles, Los Angeles, CA, USA (*Invited speaker*) (*Virtual*)
- 2022 Biology of Aging Seminars, Brown University, Providence, Rhode Island, USA (*Invited speaker*)
- 2022 UW Pathology Presents, University of Washington, Seattle, USA (*Invited speaker*) (*Virtual*)
- 2022 Inaugural Gender Medicine Symposium, Cedars-Sinai Medical Center, Los Angeles, CA, USA (*Invited speaker*) (*Virtual*)
- 2021 New Frontiers in Basic Science event, Endocrine Society (*Invited speaker*) (*Virtual*)
- 2021 International African Turquoise Killifish Conference, MDIBL (*Invited speaker*) (*Virtual*)
- 2021 Systems Immunology in Aging and Complex Diseases meeting, JAX-GM (*Speaker & co-organizer*) (*Virtual*)
- 2021 Maurice Wohl Clinical Neuroscience Institute Seminar Series, King's College London, London, UK (*Invited speaker*) (*Virtual*)
- 2021 "Making Reproductive Longevity a Reality" Seminar Series, GCRLE-NUS School of Medicine, Singapore (*Invited speaker*) (*Virtual*)
- 2021 Sam and Ann Barshop Institute for Longevity and Aging Studies Seminar Series, UT Health San Antonio, San Antonio, TX, USA (*Invited speaker*) (*Virtual*)
- 2020 Molecular and Integrative Physiology Department, University of Kansas Medical Center, Kansas City, KS, USA (*Invited speaker*) (*Virtual*)
- 2020 "Presidential Symposium: the Future of Aging Research", Gerontological Society of America's Annual meeting, Boston, MA, USA (*Invited speaker*) (*Virtual*)
- 2020 CSA Fall Seminar Series, UT Health San Antonio, San Antonio, TX, USA (*Invited speaker*) (*Virtual*)
- 2020 University of Wisconsin at Madison, Madison, WI, USA (*Invited speaker*) (*Virtual*)
- 2020 Systems Immunology in Aging and Chronic Diseases of Aging, JAX-GM (*Speaker & co-organizer*) (*Virtual*)
- 2020 Bay Area Chromatin and Epigenomics Club [BACE], Epigenomics of Aging (*Invited speaker*) (*Virtual*)
- 2020 Aging Science Talks Webinar Series (*Virtual*)
- 2020 University of Wisconsin at Madison, Madison, WI, USA (*Invited speaker*) (*cancelled due to COVID-19 pandemic*)
- 2020 National Advisory Council on Aging Speaker, Bethesda, MD, USA (*Invited speaker*)
- 2020 Annual RIKEN Aging Project Meeting, Kobe, Japan (*Invited speaker*)
- 2020 RIKEN Center for Integrative Medical Sciences, Yokohama, Japan (*Invited speaker*)
- 2019 Gerontological Society of America's Annual meeting, Austin, TX, USA (*Speaker & Session chair*)
- 2019 Plasticity in the Aging Brain Workshop, Simons Foundation, New York City, NY, USA (*Invited speaker*)
- 2019 Molecular & Computational Biology Colloquium, Dornsife College of Letters, Arts and Sciences, University of Southern California, Los Angeles, CA, USA (*Invited speaker*)
- 2019 1<sup>st</sup> "Systems Biology of Aging" meeting, JAX-GM, Farmington, CT, USA (*Speaker & co-organizer*)
- 2019 Buck Institute for Aging Research, Novato, CA, USA (*Invited speaker*)
- 2019 48<sup>th</sup> Annual Meeting of the American Aging Association, San Francisco, CA, USA
- 2019 Frontiers in Alzheimer's and Aging Research (FrA<sup>2</sup>R), Atlanta, GA, USA (*Invited speaker*)
- 2019 CZI Workshop on Inflammation, Chan-Zuckerberg Biohub, San Francisco, CA, USA (*Invited speaker*)
- 2019 Department of Genetics and Development, Institut Cochin, Paris, France (*Invited speaker*)
- 2019 Sanford-Burnham Prebys Medical Discovery Institute, La Jolla, CA, USA (*Invited speaker*)
- 2019 Chromatin Biology Symposium, University of Michigan, Ann Arbor, MI, USA (*Invited speaker*)
- 2018 Gerontological Society of America's Annual meeting, Boston, MA, USA (*Speaker & session chair*)
- 2018 Meeting on Mechanisms of Aging, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA
- 2018 9<sup>th</sup> Aquatic Models of Human Diseases conference, Marine Biology Laboratory, Woods Hole, MA, USA (*Invited speaker*)
- 2018 47<sup>th</sup> Annual Meeting of the American Aging Association, Philadelphia, PA, USA (*Invited speaker*)
- 2018 SoCal Fish Meeting, University of Southern California, Los Angeles, CA, USA (*Invited speaker*)
- 2017 Broad CIRM Center Distinguished Speaker Series, University of Southern California, Los Angeles, CA, USA (*Invited speaker*)
- 2017 INC Day 2017, Institut Neurosciences Cognition, University Paris-Descartes, Paris, France (*Invited speaker*)

- 2017 Rockefeller University, New York, NY, USA (*Invited speaker*)
- 2016 Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, USA (*Invited speaker*)
- 2016 Department of Pathology and Laboratory Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA (*Invited speaker*)
- 2016 The Mayo Clinic, Rochester, MN, USA (*Invited speaker*)
- 2016 Department of Cell and Tissue Biology, University of California, San Francisco, CA, USA (*Invited speaker*)
- 2016 Division of Nutritional Sciences, Cornell University, Ithaca, NY, USA (*Invited speaker*)
- 2016 School of Gerontology, University of Southern California, Los Angeles, California, USA (*Invited speaker*)
- 2016 The Jackson Laboratory, Bar Harbor, ME, USA (*Invited speaker*)
- 2016 Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, USA (*Invited speaker*)
- 2016 Keystone symposium on Epigenetic and Metabolic Regulation of Aging and Aging-Related Diseases, Hilton Santa Fe Historic Plaza Hotel, Santa Fe, NM, USA
- 2016 Department of Pathology & Immunology, Washington University School of Medicine, St. Louis, MO, USA (*Invited speaker*)
- 2016 Department of Genetics & Complex Diseases, Harvard T.H. Chan School of Public Health, Boston, MA, USA (*Invited speaker*)
- 2014 9<sup>th</sup> Bay Area Aging Symposium, Gladstone Institutes, University of California, San Francisco, CA, USA
- 2014 Meeting on Epigenetics and Chromatin, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA
- 2014 Département de Biologie, Institut de Biologie de l'ENS, Paris, France (*Invited speaker*)
- 2014 14<sup>th</sup> Annual Symposium for Biomedical Computing, Stanford University, Stanford, CA, USA
- 2012 5<sup>th</sup> Bay Area Aging Symposium, Gladstone Institutes, University of California, San Francisco, CA, USA
- 2009 Institut Jacques Monod, IJM2 Inauguration conference, Paris, France (*Invited speaker*)
- 2009 European Human Genetics Conference 2009, Vienna, Austria
- 2007 28<sup>èmes</sup> Journées Annuelles de la Société Française de Gériatrie et de Gériatrie, Paris, France (*Invited speaker*)

## TEACHING AND MENTORING

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### Teaching

- 2022 GERO 613 Guest Lecturer
- 2022 QBIO 105 Guest Lecturer
- 2021 Master's course on « modèles d'études pour la recherche fondamentale sur le vieillissement », Université de Toulouse (France), Guest Lecturer
- 2021 NIA annual "Summer Training Course in Experimental Aging Research" faculty
- 2021 Princeton University QCB490/MOL490, Guest Lecturer
- 2021-present GERO 516: "Introduction to genomic science for biologists"
- 2020 Master's course on « modèles d'études pour la recherche fondamentale sur le vieillissement », Université de Toulouse (France), Guest Lecturer
- 2020 USC Neuroscience Graduate Program journal club [Guest Lecturer]
- 2020 NIA annual "Summer Training Course in Experimental Aging Research" faculty (*cancelled due to COVID-19 pandemic*)
- 2020 GERO 599: "Introduction to genomic science for biologists and health scientists"
- 2019 GERO 499: "Introduction to genomic science for biologists and health scientists"
- 2019 "Frontiers in Alzheimer's and Aging Research (FrA<sup>2</sup>R)" NIH-funded course, Faculty
- 2018, 2019 GERO 510 Guest Lecturer
- 2018 GERO/BISC 519 Guest Lecturer
- 2018-present GERO 518 Guest Lecturer (*yearly*)
- 2017-present GERO 600 Guest Lecturer (*yearly*)
- 2008-2011 Teaching Assistant, Genetics and Cellular Biology, Université Paris Diderot-Paris 7

### Other



2021 Spring 2021 USC CKIDS/Datafest faculty mentor  
 2019-2021 USC Lifespan-Health pizza talk series, Co-organizer (Biology talks)

### **Mentees**

#### *Post-doctoral fellows:*

2020-present Bryan Teefy, Ph.D.  
 2020-present Min Hoo Kim, Ph.D.  
 2018-2019 Nirmal K. Sampathkumar, Ph.D.

#### *Ph.D. students:*

2021-present Cassandra McGill “Biology of Aging” Ph.D. program  
 [co-mentored with Dr. Christian Pike]  
 2019-present Ryan Lu “Biology of Aging” Ph.D. program  
 [Lab Technician (2017-2019)]  
 2018-present Juan Bravo “Biology of Aging” Ph.D. program

#### *Master students:*

2021-2022 Matthew Malone USC “Master of Science in Biochemistry and Molecular Medicine”  
 2020-2021 Emily Wang USC “Master of Science in Gerontology”  
 2020 Jane Jung USC “Master of Science in Gerontology”  
 2019-2021 Yilin Chen USC “Master of Science in Nutrition, Healthspan, and Longevity”  
 2019 Séverine Nozownik Visiting Scholar, Université Paris-Diderot  
 2019-2020 Shelby Brown USC “Master of Science in Gerontology”  
 2018 Alexandre Goumba Visiting Scholar, Université Paris-Diderot  
 2018 Hanwen Zhang USC “Master of Science in Gerontology”  
 2017-2019 Rochelle W. Lai USC “Master of Science in Nutrition, Healthspan, and Longevity”

#### *Rotation students:*

2022 Maxim Averbukh USC Biology of Aging Program, Spring  
 2021 Lauryn Higginson USC Molecular and Computational Biology Program, Fall  
 2021 Sanjana Rajeev USC Molecular and Computational Biology Program, Spring  
 2021 Rebecca Stark USC Neuroscience Graduate program, Spring  
 2021 Nadejda Butova USC Molecular and Computational Biology Program, Spring  
 2021 Zeferino Reyna USC Molecular and Computational Biology Program, Spring  
 2019 Lewis Randall USC Biology of Aging Program, Spring  
 2019 Daria Timonina USC Biology of Aging Program, Spring  
 2018 Brandon Butler USC Neuroscience Graduate program, Fall  
 2018 Erin Donahue USC Neuroscience Graduate program, Winter  
 2017 Serban Ciotlos USC Biology of Aging Program, Fall  
 2017 Angelina Holcom USC Biology of Aging Program, Fall  
 2017 Taekyu Kang USC Biology of Aging Program, Fall

#### *Undergraduate students:*

2022-present Justin Wang USC Quantitative Biology Major  
 2022-present Sonja Shariar USC Human Biology Major  
 2022-present Thea Grauer USC Neuroscience Major  
 2022 Wyatt Webb USC Health and Human Sciences Major  
 2022 Sheehan Belleca Summer internship, CSULA  
 2022-present Olivia White USC Quantitative Biology Major  
 2022-present Alan Xu USC Quantitative Biology Major  
 2022-present Kelly Koh USC Human Development and Aging Major

2021-present	Katelyn Hsu	USC Human Biology Major
2021-present	Rajyk Bhala	USC Health and Human Sciences Major
2020-2021	Catherine Kim	USC Human Biology and Communications Major
2019-present	Sanjana Paye	USC Neuroscience Major
2019-2022	Eric Wang	USC Human Biology Major
2019-2021	Lois Albert Angelo	USC Gerontology Major
2019	Evelyn Navar	Summer ADAR program exchange with UC Davis
2018-2019	Allison Chae	USC Biological Sciences Major
2018-2019	Astoria Ho	USC Lifespan Health Major
2018-2019	Courtney Shen	USC Gerontology Major
2018	Trang Hua	Summer ADAR program exchange with UC Davis

*High-school students:*

2019-present	Isabella Lau
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***Awards received by Mentees***

Juan Bravo	2018	Biology of Aging NIH/NIA T32 pre-doctoral fellowship
	2019	NSF Graduate Research Fellowship
Rajyk Bhala	2022	USC's Dornsife Summer Undergraduate Research Fund fellowship
Yilin Chen, M.Sc.	2019	Bert W. Martin Foundation Scholarship
	2020	Doris J. Wescott Endowed Fellowship in Aging
Katelyn Hsu	2022	Mr. and Mrs. Scott Goldstein Family Scholarship
Min Hoo Kim, Ph.D.	2020	GCRLE post-doctoral award
	2020	FASEB Reproductive Aging Conference Poster Award
Rochelle W. Lai, M.Sc.	2019	USC Leonard Davis School Honors Peterson Master's Student Award
	2019	John Milner Nutrition and Cancer Prevention Research Practicum (NCI)
	2019	Renken Endowed Scholarship
	2018	Doris J. Wescott Endowed Fellowship in Aging
Ryan Lu	2020	Diana Jacobs Kalman/AFAR Scholarship
	2021	Biology of Aging NIH/NIA T32 pre-doctoral fellowship
Cassandra McGill	2021	Biology of Aging NIH/NIA T32 pre-doctoral fellowship
	2021	Travel Award for the American Aging Association meeting
	2022	American Aging Association Meeting Trainee Data Blitz award
Bryan Teefy, Ph.D.	2020	Biology of Aging NIH/NIA T32 post-doctoral fellowship
	2021	Biology of Aging NIH/NIA T32 post-doctoral fellowship
Eric Wang	2021	USC's Fall Provost Research Fellowship

***PhD Committee Member***

*Current:*

Katelyn	Adam	Jennifer Garrison lab, Biology of Aging, USC/Buck
Edward	Anderton	Gordon Lithgow lab, Biology of Aging, USC/Buck
Mezmur	Belew	Matthew Michael lab, MCB, USC
Brandon	Butler	Justin Ichida lab, NGP program, USC
C. Princesse	Bwiza	C. David Lee lab, Biology of Aging, USC/Buck
Shihui	Chen	Carolyn Phillips lab, MCB, USC
Serban	Ciotlos	Judith Campisi lab, Biology of Aging, USC/Buck
Erin	Donahue	Mike Jakowec lab, NGP program, USC

Huixin (Zoe)	Du	Dan Winer lab, Biology of Aging, USC/Buck
Melanie	Flores	Pinchas Cohen lab, MCB, USC
Caleb	Ghione	Matt Dean lab, MCB, USC
Taekyu	Kang	Rachel Brem lab, Biology of Aging, USC/Buck
Tingting	Li	Susan Forsburg lab, MCB, USC
Jiahui	Liu	Christian Pike lab, Biology of Aging, USC/Buck
James	Nhan	Sean Curran lab, MCB, USC
Joshua	Parker	Susan Forsburg lab, MCB, USC
Sanjana	Rajeev	Carolyn Phillips lab, MCB, USC
Zefeirino	Reyna	Pinchas Cohen lab, MCB, USC
Cayce	Shaw	Dena Dubal lab, Rehabilitation Science, UCSF
Noah	Simon	Rachel Brem lab, Biology of Aging, USC/Buck
Nicole	Stuhr	Sean Curran lab, MCB, USC
Alan	Tomusiak	Eric Verdin lab, Biology of Aging, USC/Buck
Christian	Turner	Sean Curran lab, MCB, USC
Bennett	Van Camp	Sean Curran lab, Biology of Aging, USC
Oswaldo	Villa	Sean Curran lab, Biology of Aging, USC
Dylan	Wallis	Carolyn Phillips lab, MCB, USC
Jenny	Zhao	Carolyn Phillips lab, MCB, USC

*Graduated:*

Amy Hammerquist, Ph.D.	Sean Curran lab, MCB, USC	[graduated 2021]
Albina Ibrayeva, Ph.D.	Michael Bonaguidi lab, Biology of Aging, USC/Buck	[graduated 2022]
Kevin Manage, Ph.D.	Carolyn Phillips lab, MCB, USC	[graduated 2021]
Dieu An Nguyen, Ph.D.	Carolyn Phillips lab, MCB, USC	[graduated 2021]
Joseph Reynolds, Ph.D.	C. David Lee lab, Biology of Aging, USC/Buck	[graduated 2020]

## **RESEARCH SUPPORT**

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### **Ongoing support**

- 08/2021-06/2026 **R35 MIRA award R35GM142395** (Role: PI)  
 “Understanding the regulation and impact of transposable elements in Vertebrate health and disease”
- 05/2021-04/2023 **Cure Alzheimer’s Fund** (Role: co-PI; PI: Pike)  
 “Protection against *APOE4* with longevity-promoting interventions”
- 10/2020-09/2023 **Simons Foundation SF811217** (Role: co-PI)  
 “Simons Collaboration on Plasticity in the Aging Brain”
- 08/2020-02/2023 **Junior Scholar Award (GCRLE)** (Role: PI)  
 “Establishing new age-relevant mouse models of menopause”
- 06/2020-06/2024 **Pew Biomedical Scholar Award** (Role: PI)  
 “Sex-dimorphic regulation of innate immunity during aging”

### **Completed support**

- 07/2019-03/2022 **NIH award R21 AG063739** (Role: PI)  
 “Transposable elements as drivers of normal and accelerated aging in Vertebrates”
- 01/2021-12/2021 **2021 USC/Buck Nathan Shock Center pilot grant** (PI)  
 “Characterizing the transposon-induced secretome in human fibroblasts”
- 05/2020-10/2021 **NIH award R21 NS111192 (subaward)** (Role: co-investigator; PI: Moore)

“Establishment of a human, age-specific model for axon growth and regeneration studies”

09/2020-08/2021 **Glenn and AFAR Junior Faculty Award** (Role: PI)

“A genome-to-phenome toolkit to accelerate research into aging in a naturally short-lived vertebrate model”

07/2019-06/2021 **Rose Hills Foundation Innovator Grant** (PI)

“Sex-dimorphic mechanisms in the regulation of healthy mammalian aging”

04/2017-05/2021 **R00 Career Development award (National Institutes of Health) R00AG049934** (PI)

“Regulation of transcriptional consistency by broad H3K4me3 domains in young cells and during aging”

07/2019-06/2020 **NAVIGAGE foundation seed grant** (PI)

“Transposable elements as drivers of healthy aging in vertebrates”

07/2019-06/2020 **2019 University of Washington Nathan Shock Center pilot grant** (PI)

“Sex-dimorphism in aging macrophages: metabolomic profiling”

07/2018-06/2019 **Hanson-Thorell family scholarship** (PI)

“A systems biology approach to uncover and target a core vertebrate longevity network”

11/2018-12/2018 **2018 JAX Nathan Shock Center pilot grant** (PI)

“Sex-dimorphism in aging macrophages”

04/2015-03/2017 **NIH Pathway to Independence Award K99 AG049934** (PI)

“Regulation of transcriptional consistency by broad H3K4me3 domains in young cells and during aging”

01/2013-12/2013 **Stanford University Dean’s Postdoctoral Fellowship** (PI)

“H3K4me3 breadth in mouse neural stem cells”

## **UNIVERSITY AND SCHOOL COMMITTEES**

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2022-present USC/Buck Nathan Shock Center, Research Development Core, Co-director

2021-present Nathan Shock Centers Communications Strategy Committee, USC/Buck representative  
(Chair, 2022-present)

2021 Dean Review Committee, USC Leonard Davis School of Gerontology

2019-present Institutional Animal Care and Use Committee, University of Southern California

2018-present Ph.D. in the Biology of Aging Program, Executive Committee

2017-present Website Committee, USC Leonard Davis School of Gerontology  
(Chair, 2019-present)

## **PROFESSIONAL MEMBERSHIPS**

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2022-present Society for Leukocyte Biology (SLB)

2019-2021 New York Academy of Sciences (NYAS)

2019-present Sigma Xi Honor Society ( $\Sigma\Xi$ )

2019-present American Association of Immunologists (AAI)

2018-present Gerontological Society of America (GSA)

2018-present American Aging Association (AGE)

2017-present American Association for the Advancement of Science (AAAS)

## **ACADEMIC OUTREACH**

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2022 Antibodies podcast guest, “Lifelong Differences in Neutrophil Biology”

2021 Career Development Seminar for HHMI Leading Edge Scholars

2021 “Experimental Biology of Aging” webinar, organized by AIFL and the Zuckerman institute

2020 “Gero R Outreach [GRO] in isolation” virtual workshop series, teaching R to the Gero community

2020 USC Women in Molecular Biology (WiM) Curriculum Vitae workshop, panelist

- 2020 Guest on “Finding Genius” Podcast (<https://bit.ly/30AxrQC>)  
2020 Faculty in NIA-summer training course (*cancelled due to COVID-19 pandemic*)  
2019 Faculty in NIH-funded “Frontiers in Alzheimer’s and Aging Research (FrA<sup>2</sup>R)” course, targeted for Underrepresented Minorities in Science  
2018-present Curator and co-founder for the *MyAgeGroup* twitter feed (<https://twitter.com/myagegroup>)  
2016 Category Judge at the Synopsys Championship Science and Technology Fair, San Jose, CA  
2008-2010 L’école de l’ADN au Généthon, interventions in underprivileged high-schools around Paris, France

## **SCIENTIFIC IDENTIFIERS**

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Web of Science ResearcherID K-7048-2012  
ORCID ID 0000-0002-7401-4777