Updated July 2022

JAMES R. CYPSER, PhD, MBA

Curriculum Vitae

CURRENT POSITION

Senior Research Associate
Institute for Behavioral Genetics, University of Colorado Boulder
Boulder, CO USA

DIGITAL PROFILES

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CONTACT INFORMATION

720-841-2215 (work / mobile phone)
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University of Colorado Boulder

EDUCATION

MBA
University of Colorado Boulder, Leeds School of Business
5/2012 - 5/2014

PhD (Psychology; Certification in Behavioral Genetics)
University of Colorado Boulder
Thesis: “Characterization and Genetics of Induced Stress Resistance and Life Extension in *Caenorhabditis elegans*”
8/1996 – 5/2002

BA (Molecular, Cellular, and Developmental Biology)
University of Colorado Boulder
8/1988 – 5/1991

RESEARCH EXPERIENCE

University of Colorado, Institute for Behavioral Genetics (IBG), Boulder, CO
7/2022 – present (Senior Research Associate)

University of Colorado, Institute for Behavioral Genetics (IBG), Boulder, CO
6/2005 - 7/2018, 10/2019-7/2022 (Research Associate)

University of Colorado, Department of Integrative Physiology Boulder, CO
9/2015 - 3/2016 (Research Associate; concurrent with IBG, above)

Peptide, Inc. (subsidiary of Stem Cell Products, LLC) Denver, CO
9/2006 – 12/2006 (Consultant)

University of Arkansas for Medical Sciences,
Dept. of Neurobiology and Developmental Sciences, Little Rock, AR
6/2004 – 6/2005 (Postdoctoral Research Associate)

RESEARCH EXPERIENCE (continued)

Brown University, Dept. of Ecology and Evolutionary Biology, Providence, RI
5/2002 – 6/2004 (Postdoctoral Research Associate)

University of Colorado, Institute for Behavioral Genetics, Boulder, CO
8/1996 – 5/2002 (Research Assistant and Graduate Student)

University of Colorado Health Sciences Center, Dept. of Medical Oncology, Denver, CO
2/1993 – 8/1996 (Professional Research Assistant)

5 Prime 3 Prime, Inc, Boulder, CO
5/1991 – 1/1993 (Research Assistant)

MANAGEMENT EXPERIENCE:

Cirque Cryotech LLC, Boulder, CO
9/ 2019 - 10/ 2021 (Co-founder and Chief Executive Member)
Early-stage start-up developing inventions regarding drug identification made by W.S. Chick, T.E. Johnson, G. Schumacher and me. Cirque Cryotech's focus was on the use of drugs to ablate toxicity of cryoprotective agents. Company discontinued 10/ 2021.

CRITICAL SKILLS

Research

- Electrophoresis (nucleic acid & protein)
- Sequence analysis (including BLAST)
- Instrumentation (PCR, nucleic acid concentration)
- Flow cytometry (nematode)
- Cell culture (mammalian & bacterial)
- Model organism experimentation & husbandry (nematode, mouse, Drosophila)

Administrative / Business

- Standard Operating Procedures (Institutional Animal Care & Use)
- Biosafety Level 2 certification
- MBA skills & interest (especially entrepreneurship)

Analytical & Instructional

- Statistics
- MS Office (WORD, Excel, PowerPoint)
- Superior verbal and written communication skills

STATEMENT OF CURRENT WORK

Research (University of Colorado Boulder): I am currently working on two projects. The first is the application of senomorphic drugs to Alzheimer's Disease using nematode models. The second is the application of single-cell RNA-sequencing to nematode cells expressing human Tau protein (associated with multiple forms of neurodegeneration). Previously in the same position, I investigated the genetics of stress resistance in response to injury caused by cryopreservation of mouse embryonic stem cells. I focused on six mutant cell lines that display resistance to the chemical toxicity of solutions used to vitrify whole organs. I also used the nematode *C. elegans* as well as mammalian cell culture in studies of amyotrophic lateral sclerosis (conducted in the laboratory of Dr. Christopher Link). I have also recently worked with mutant whole mice displaying resistance to oxidative stress and possibly extended life span. Previous *C. elegans* work focused on induced stress resistance and life extension (hormesis), and on stochastic contributions to longevity reported by heat shock protein expression in isogenic populations of *C. elegans.*

Administration: I was responsible for writing grant applications targeting Federal and state of Colorado funding, as well as other laboratory administrative functions. I have also been responsible for vertebrate (mouse) regulatory protocol compliance with Institutional Animal Care and Use standards.

Teaching: I have trained over fifty undergraduate students and three graduate students (Taylor, Newell, Schumacher). The first graduate student used mouse embryonic stem cells to study the genetics of resistance to injury caused by cryopreservation. The second graduate student used whole mice and nematodes to study effects of the insulin-like pathway on health span. The third graduate student used mouse embryonic stem cells to study cryogenic solutions.

CURRENT RESEARCH GRANT

National Institute on Aging R21 Award, 1R21AG067147 "*C. elegans* as a Model of Cell Senescence and Alzheimer's Disease", 4/2020 – 3/2022, $275,000 (direct costs) as well as Administrative Supplement 3R21AG067147-02S1 8/2021 – 4/2022, $91,789 (direct costs). This grant was assigned a no-cost extension until 4/30/2023.

PAST RESEARCH GRANT

Ellison Medical Foundation New Opportunities Award, "Using Micro Array Technology to Identify Genetic Factors Common to Multiple Forms of Life Extension in *C. elegans*", 1/2001 - 1/2002, $9,259 (direct costs).

HONORS AND AWARDS

Received 2020 Arthur W. Rowe Cryobiology Best Paper Award for “Genetic Suppression of Cryoprotectant Toxicity."
https://www.societyforcryobiology.org/arthur-w-rowe-best-paper-award

Received 2002 Geron-Samuel Goldstein Distinguished Paper Award from Journal of Gerontology, for “Multiple stressors in *Caenorhabditis elegans* induce stress hormesis and extended longevity”.

Received 2001 First Prize ($350), Second Annual Western American Writing Contest, for a short fiction work, “Silence Meeting Eagles: A Confluence of Faiths”. Based on real-life experiences as Youth Supervisor during three intercultural service projects directed by Native American (Lakota) residents of the Pine Ridge Indian Reservation.
https://www.colorado.edu/today/2001/05/01/cu-boulder-students-win-western-writing-awards

INVENTIONS

- U.S. Patent Application, “Compositions and methods for reducing cryopreservation toxicity” filed by the Venture Partners at University of Colorado Boulder (11/4/2019). Inventors: T.E. Johnson, W.S. Chick**,** J.R. **Cypser**, G.J. Schumacher.
- U.S. Provisional Patent Application No. 62/755,892, “Compositions and methods for reducing cryopreservation toxicity” filed by the Tech Transfer Office of University of Colorado (11/5/2018). Inventors: T.E. Johnson, W.S. Chick, J.R. **Cypser**, G.J. Schumacher.
- U.S. Provisional Patent Application No. 62/411,462, “A method for enhanced organismic resistance to disease, increased survival and slowed aging” filed by the Tech Transfer Office of the University of Colorado (10/21/2016). Inventors: T.E. Johnson, W.S. Chick, J.R. **Cypser**, and M. Ludwig.
- U.S. Provisional Patent Application No. 62/078,285, “A method for enhanced organismic resistance to disease, increased survival and slowed aging” filed by the Tech Transfer Office of the University of Colorado (11/7/2014). Inventors: T.E. Johnson, W.S. Chick, J.R. **Cypser**, and M. Ludwig.

TEACHING / SUPERVISORY EXPERIENCE

- Trained and supervised over fifty undergraduates, graduate students and hourly employees in laboratory techniques including animal husbandry (mice, nematodes, and Drosophila), cell culture, laboratory safety, and regulatory requirements as well as experimental design, statistics, scientific writing, and public presentations (1998 – present).
- Mentored four undergraduate Honors Theses (2010- 2014).
- Arranged presentation by one student at Society for Advancement of Chicanos and Native Americans in Science (SACNAS; 2013)
- Guest-lectured in Integrative Physiology (2009, 2010; Doug Seals, instructor).
- Served as Teaching Assistant and guest lecturer for Introduction to Behavioral Genetics (2000, Mike Stallings, instructor).

SELECTED PUBLICATIONS

(*See complete list of Publications below References & Recommendations*.)

Cypser, J.R. and Johnson, T.E. (2022) *C. elegans* as a model of senomorphic action in Alzheimer's Disease. *Journal of Gerontology*, submitted April, 2022.

Cypser, J.R.; Chick, W.; Fahy, G.; Johnson, T.E. (2019) Genetic modulation of cryoprotectant toxicity. *Cryobiology* **86**: 92-102. https://www.sciencedirect.com/science/article/pii/S0011224018302669

Stamper, B.L.N.; **Cypser**, J.R.; Kechris, K.; Kitzenberg, D.A.; Tedesco, P.M. and Johnson, T. (2017) Movement decline across lifespan of *Caenorhabditis elegans* mutants in the insulin/insulin-like signaling pathway. *Aging Cell* **e12704**. http://onlinelibrary.wiley.com/doi/10.1111/acel.12704/full

Cypser, J.R.; Wu, D.; Park, S.-K.; Ishii, T.; Tedesco, P.M.; Mendenhall, A.R.; and Johnson, T. (2013) Predicting longevity in *C. elegans*: Fertility, mobility and gene expression. Mech Ageing Dev **134**: 291-297. https://www.sciencedirect.com/science/article/pii/S0047637413000237

Cypser, J.R., Tedesco, P., and Johnson, T.E. (2006) Hormesis and aging in *Caenorhabditis elegans*. *Experimental Gerontology* **41**: (10): 935-939. https://www.sciencedirect.com/science/article/pii/S053155650600283X

REFERENCES (Supervisors)

Thomas E. Johnson, PhD
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REFERENCE (Collaborator)

Gregory Fahy, PhD (Vice-President and Chief Scientific Officer)
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14960 Hilton Drive
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FAX: (909)-466-8618
Email: gfahy@21cm.com

COMPLETE LIST OF PUBLICATIONS (reverse chronological order)

Peer-Reviewed Papers and Book Chapters:

1. **Cypser**, J.R.; Chick, W.; Fahy, G.; Johnson, T.E. (2019) Genetic modulation of cryoprotectant toxicity. *Cryobiology* **86**: 92-102.
2. Stamper, B.L.N.; **Cypser**, J.R.; Kechris, K.; Kitzenberg, D.A.; Tedesco, P.M. and Johnson, T. (2017) Movement decline across lifespan of *Caenorhabditis elegans* mutants in the insulin/insulin-like signaling pathway. *Aging Cell* **e12704**.
3. **Cypser**, J.R.; Kitzenberg, D.; Park, S.-K. (2013) Dietary restrictions in *C. elegans*: Recent advances. *Experimental Gerontology* **48**: 1014-1017.
4. **Cypser**, J.R.; Wu, D.; Park, S.-K.; Ishii, T.; Tedesco, P.M.; Mendenhall, A.R.; and Johnson, T. (2013) Predicting longevity in *C. elegans*: Fertility, mobility and gene expression. *Mechanisms of Ageing & Development* **134**: 291-297.
5. Mendenhall, A.R., Wu, D., Park, S.-K., **Cypser**, J.R., Tedesco, P.M., Link, C.D., Phillips, P.C. and Johnson, T.E. (2011) Genetic dissection of late-life fertility in *Caenorhabditis elegans. Journal of Gerontology **66A**: 842-854.*
6. Seewald, A.K., **Cypser**, J.R., Mendenhall A.R., and Johnson, T.E. (2010) Quantifying phenotypic variation in isogenic *Caenorhabditis elegans* expressing *Phsp-16.2::gfp* by clustering 2D expression patterns. *PLoS ONE* **5**: e11426.
7. Asencio, C., Navas, P., Cabello, J., Schnabel, R., **Cypser**, J.R., Johnson, T.E., and Rodriguez-Aguilera, J.C. (2009) Coenzyme Q supports distinct developmental processes in *Caenorhabditis elegans*. *Mechanisms of Ageing and Development* **130**: 145-153.
8. Wu, D.; Rea, S.L.; **Cypser**, J.R. and Johnson, T.E. (2009) Mortality in *Caenorhabditis elegans*: Remembrance of conditions past. *Aging Cell* **8**: 666–675.
9. Wu, D., **Cypser**, J.R., Yashin, A.I. and Johnson, T.E. (2009) Multiple mild heat-shocks decrease the Gompertz component of mortality in *Caenorhabditis elegans. Experimental Gerontology* **44**: 607-612.
10. Wu, D., **Cypser**, J.R., Yashin, A.I. and Johnson, T.E. (2008) The U-shaped response of initial mortality in *Caenorhabditis elegans* to mild heat shock: Does it explain recent trends in human mortality? *Journal of Gerontology* **63A**: 660-668.
11. Rea, S.L., Wu, D., **Cypser**, J.R. Vaupel, J.W., and Johnson, T.E. (2005) A stress-sensitive reporter predicts longevity in isogenic populations of *Caenorhabditis elegans. Nature Genetics* **37**: 894 – 898.

12. Wessells, R.J., Fitzgerald, E., **Cypser**, J.R., Tatar, M. and Bodmer, R. (2004) Insulin regulation of heart function in aging fruit flies. *Nature Genetics* **36**: 1275-81.
13. **Cypser**, J.R. and Johnson, T.E. (2003) Hormesis in *Caenorhabditis elegans* dauer-defective mutants. *Biogerontology* **4**: 203-214.
14. Wu, Z., Smith, J.V., Paramasivam, V., Butko, P., Khan, I., **Cypser**, J.R. and Luo, Y., (2002) Ginkgo biloba extract EGb 761 increases stress resistance and extends life span of *Caenorhabditis elegans*. *Cell and Molecular Biology* **48**: 725-731.
15. Johnson, T.E., Henderson, S., Murakami, S., de Castro, E., de Castro, S.H., **Cypser**, J.R., Rikke, B., Tedesco, P., and Link, C. (2002) Longevity genes in the nematode *Caenorhabditis elegans* also mediate increased resistance to stress and prevent disease. *Journal of Inherited Metabolic Disease* **25**:197-206.
16. Yashin, A.I., **Cypser**, J.R., Johnson, T.E., Michalski, A.I., Boyko, S.I., and Novoseltsev, V.N. (2002) Heat shock changes the heterogeneity distribution in populations of *Caenorhabditis elegans*: does it tell us anything about the biological mechanism of stress response? *Journal of Gerontology* **57A**: B83-B92.
17. **Cypser**, J.R. and Johnson, T.E. (2002) Multiple stressors in *Caenorhabditis elegans* induce stress hormesis and extended longevity. *Journal of Gerontology* **57A**: B109-B114.
18. Johnson, T.E., de Castro, E., de Castro, S.H., **Cypser**, J.R., Henderson, S., and Tedesco, P.M. (2001) Relationship between increased longevity and stress resistance as assessed through gerontogene mutations in *Caenorhabditis elegans*. *Experimental Gerontology* **36**: 1609-1617.
19. Butov, A.A., Johnson, T.E., **Cypser**, J.R., Sannikov, I.A., Volkov, M.A., Sehl, M.E., and Yashin, A.I. (2001) Hormesis and debilitation effects in stress experiments using the nematode worm *Caenorhabditis elegans*: The model of balance between cell damage and HSP levels. *Experimental Gerontology* **37**: 57-66.
20. Michalski, A.I., Johnson, T.E., **Cypser**, J.R., and Yashin, A.I. (2001) Heating stress patterns in *Caenorhabditis elegans* longevity and survivorship. *Biogerontology* **2**: 35-44.
21. Yanase, S., **Cypser**, J., Johnson, T.E. and Ishii, N. (2000) Adaptive response extends the life span through signaling to DAF-16 in *Caenorhabditis elegans. Journal of Radiation Research*, **41**: 417-419.
22. Johnson, T.E., **Cypser**, J.R., de Castro, E., de Castro, S., Henderson, S., Murakami, S., Rikke, B., Tedesco, P.M., and Link, C.D. (2000) Gerontogenes mediate health and longevity in nematodes through increasing resistance to environmental toxins and stressors. *Experimental Gerontology* **35**: 687-694.
23. Murakami, S., Tedesco, P.M., **Cypser**, J.R., and Johnson, T.E. (2000) Molecular genetic mechanisms of life span manipulation in *C. elegans*, in “The Proceedings of the EMBO Meeting on Aging”, New York Academy of Sciences **908**: 40-49.
24. Johnson, T.E., Shook, D., Murakami, S., and **Cypser**, J.R. (1999) Increased resistance to stress is a marker for gerontogenes leading to increased health and longevity in nematodes, in “Molecular Biology of Aging”, Alfred Benzon Symposium 44, p 25-34, Editors V.A. Bohr, B.F.C. Clark, T. Stevnsner, Munksgaard, Copenhagen.
25. **Cypser**, J.R. and Johnson, T.E. (1999) The *spe-10* mutant has longer life and increased stress resistance. *Neurobiology of Aging* **20**: 503-512.

26. Link, C.D., **Cypser**, J.R., Johnson, C.J., and Johnson, T.E. (1999) Direct observation of stress response in *Caenorhabditis elegans* using a reporter transgene. *Cell Stress and Chaperones* **4**: 235-242.
27. Song, W.-J., Van Keuren, M.L., Drabkin, H.A., **Cypser**, J.R., Gemmill, R.M., and Kurnit, D.M. (1996) Assignment of the human slow-twitch skeletal muscle/cardiac troponin C gene (TNNC1) to human chromosome 3p21.3 - 3p14.4 using somatic cell hybrids, *Cytogenetics and Cell Genetics* **75**: 36-37.
28. Gemmill, R.M., Chumakov, I., Scott, P., Waggonner, B., Rigault, P., **Cypser**, J., Chen, Q., Weissenbach, J., Gardiner, K., Wang, H., Pekarsky, K., Le Gall, I., Le Paslier, D., Guillou, S., Li, E., Robinson, L., Hahner, L., Todd, S., Cohen, D., and Drabkin, H.A. (1995) A second generation YAC contig map of human chromosome 3, *Nature* **377 (supp)**: 299-319.

Abstracts

1. Johnson, T.E., **Cypser**, J.R., Rea, S.L., and Mendenhall, A.R. (2016) Molecular Dissection of Hormesis. International Dose Response Society Conference, University of Massachusetts at Amherst. April 19 and 20, 2016 "Hormesis, Aging and Enhancing Longevity"
2. Johnson, T.E., Rikke, B.A., Liao, C.-Y., Nelson, J., **Cypser**, J.R., Tedesco, P., Link, C. and Park, S.-K. (2011) Genetic studies on caloric restriction in the worm and in the mouse: What does it tell us? Halle, Germany
3. **Cypser**, J.R., Tedesco, P., Wu, D., Ishii, T. and Johnson, T.E. (2010) A biomarker of longevity: associated phenotypes. 2010 Aging, Metabolism, Stress, Pathogenesis, and Small RNAs in *C. elegans* Meeting, Madison, WI.
4. Mendenhall, A.R., Seewald, A.K., **Cypser**, J.R., Tedesco, P.M., and Johnson, T.E. (2009) Regulation of gene expression: Where did that noise come from!? 17th International *C. elegans* Meeting, Los Angeles, CA.
5. **Cypser**, J.R., Tedesco, P., Park, S.-K., and Johnson, T.E. (2007) Stochastic variation in longevity in *C. elegans*: Secondary phenotypes that predict increased survival. Annual Meeting of the American Aging Association, San Antonio, TX.
6. **Cypser**, J.R. and Johnson, T.E. (2006) Higher expression of an *hsp-16::GFP* reporter is a strong predictor of increased survival in *C. elegans*, but why? Annual Meeting of the American Aging Association, Boston, MA.
7. **Cypser**, J.R. and Johnson, T.E. (2001) *C. elegans* as a model for hormetic life extension. Annual Meeting of the American Aging Association, Madison, WI.
8. Yashin, A.I., **Cypser**, J.R., Johnson, T.E., Michalski, A.I., Boyko, S.I., and Novoseltcev, V.N. (2000) Aging and survival after different doses of heat shock: the results of analysis of data from stress experiments with the nematode *Caenorhabditis elegans.* European Conference on Biogerontology, St-Petersburg, Russia.
9. Johnson, T.E., Murakami, S., Tedesco, P., **Cypser**, J., de Castro, E. and Link, C. (1999) Uncovering the secrets of aging using genetics in the nematode *C. elegans*. Proceedings of the 22nd Annual Meeting of the Japanese Society of Biomedical Gerontology, Kyoto, Japan.

10. **Cypser**, J.R., and Johnson, T.E. (1999) Hormesis, gerontogenes and *daf-16*. Keystone Symposia: Aging: Genetic and Environmental Influences on Life Span, Durango, CO.
11. Johnson, T.E., Murakami, S., Link, C., Tedesco, P., Rikke, B. and **Cypser**, J. (1999) Genetic and environmental manipulation of longevity in *C. elegans.* Keystone Symposia: Aging: Genetic and Environmental Influences on Life Span, Durango, CO.
12. Johnson, T.E., Murakami, S., Link, C., Rikke, B. and **Cypser**, J. (1998) Increased resistance to stress is a marker for gerontogenes leading to increased health and longevity in nematodes. Alfred Benzon Symposium No. 44, Copenhagen, Denmark.
13. Johnson, T.E., Murakami, S., **Cypser**, J., Link, C., Rikke, B. and Tedesco, P. (1998) Genetic manipulation of longevity in *C. elegans* through increased response to stress. Internet World Congress, http://www.mcmaster.ca/inabis98/index.html.
14. Johnson, T.E., Murakami, S., Link, C., Rikke, B., Dames, S. and **Cypser**, J. (1997) Gerontogenes leading to increased health and longevity in nematodes. Bat-Sheva Seminar on Cellular, Molecular and Genetic Aspects of Aging and Longevity, Israel.
15. **Cypser**, J.R. and Johnson, T.E., (1997) Stress resistance and life span in selected strains. 11th International *C. elegans* Meeting, Madison, WI.

Invited Commentaries

Cypser, J.R., Kitzenberg, D., and Park, S.-K. (2013) Dietary restriction in *C. elegans*: Recent Advances. Experimental Gerontology **48** (10): 1014–1017.

Cypser, J.R. Meeting Report - 44th Annual Drosophila Research Conference. (2003) Science of Aging SAGE KE, 2003 pe12.

Seminars & Invitations to Speak

University Tor Vergata, Rome, Italy, (May, 2009) "*C. elegans* as a model of induced stress resistance and aging".

American Aging Association Meeting, Boulder, CO (May, 2008) "Genetic and Stochastic Aspects of Hormesis".

2008 International Dose-Response Society Meeting, Amherst, MA (April, 2008) "Genetic Dissection of Hormesis: Ponce d'*elegans*".

SERVICE CONTRIBUTIONS

- Arranged for a supervised undergraduate to present a poster describing that student's laboratory work at the annual meeting of the Society for Advancement of Chicanos and Native Americans in Science (2013).
- Three extramural seminars reporting his work (Amherst, MA; Boulder, CO and Rome, Italy)
- Dr. Cypser has provided extensive help with administrative matters to a fellow faculty member suffering from dementia with Lewey bodies.
- Interviewed for Washington Post article recapping Tom Johnson's career https://www.washingtonpost.com/health/researcher-on-aging-confronts-his-own-mortality/2020/03/20/81326d7e-3d55-11ea-baca-eb7ace0a3455_story.html