

## Curriculum Vitae

**PERSONAL DATA**

Name: Tim Jenkins

**EDUCATION**

| <u>Years</u> | <u>Degree</u>       | <u>Institution (Area of Study)</u>  |
|--------------|---------------------|---|
| 2013 - 2014  | Postdoctoral Fellow | University of Utah (Surgery / Urology)<br>Salt Lake City, UT, United States                 |
| 2009 - 2013  | Ph.D.               | University of Utah (Physiology)<br>Salt Lake City, UT, United States                        |
| 2004 - 2008  | B.S.                | Brigham Young University (Physiology and<br>Developmental Biology) Provo, UT, United States |

**ACADEMIC/CAREER HISTORY****Brigham Young University – Department of Cell Biology and Physiology**

2019 - Present      Assistant Professor

**University of Utah – Department of Surgery (Urology)**

2019 – Present      Adjunct Faculty

2017 – 2019      Assistant Professor

2016 – 2017      Research Assistant Professor

**PROFESSIONAL EXPERIENCE****Full-Time Positions**2014 – 2016      Research Associate, University of Utah School of Medicine, Department of  
Surgery, Division of Urology, Salt Lake City, UT**CITIZENSHIP EXPERIENCE****EXTERNAL CITIZENSHIP****Editorial Experience**

2020 – Present      Editorial Board for Systems Biology in Reproductive Medicine

2018 – 2021      Editorial Board for Fertility and Sterility

**Grant Review Experience**

2021      Grant review: French National Research Agency

2020      Grant review: Poland Nation Science Center

2019      Grant review: European Science Foundation / Flander's Foundation

### **Symposium/Meeting Chair/Coordinator**

- 2018 Panel discussion member: "The Future: SSC Profiling and Culturing" Annual AUA meeting; San Francisco, CA; May, 2018
- 2018 Panel discussion member: "Should We Should Freeze Azoospermic Testicular Tissue from Pre-Pubertal Boys Undergoing Chemo?" Annual AUA meeting; San Francisco, CA; May, 2018
- 2018 Panel discussion member: "How Might SSC/Testis Profiling be Utilized by Fertility Clinicians?" Annual AUA meeting; San Francisco, CA; May, 2018
- 2016 Co-Chair Selected Abstract session: 2016 ASA basic Science Workshop; New Orleans, LA; April, 2016

### **Reviewer Experience**

- 2020 – Present Reviewer for Aging Cell
- 2020 – Present Reviewer for Scientific Reports
- 2019 – Present Reviewer for The New England Journal of Medicine
- 2019 – Present Reviewer for Biotechniques
- 2019 – Present Reviewer for The International Journal of Women's Health
- 2019 – Present Reviewer for Theriogenology
- 2019 – Present Reviewer for Molecular Human Reproduction
- 2019 – Present Reviewer for Clinical Medicine Insights: Reproductive Health
- 2019 – Present Reviewer for BMC Urology
- 2019 – Present Reviewer for Journal of Assisted Reproduction and Genetics
- 2019 – Present Reviewer for Andrologia
- 2018 – Present Reviewer for Epigenetics and Chromatin
- 2018 – Present Reviewer for Reproductive Biology
- 2017 – Present Reviewer for Systems Biology in Reproductive Medicine
- 2015 – Present Reviewer for Asian Journal of Andrology
- 2015 – Present Reviewer for Molecular Reproduction and Development
- 2015 – Present Reviewer for PLoS One
- 2014 – Present Reviewer for Fertility and Sterility
- 2013 – Present Reviewer for Journal of Andrology

### **Current Memberships**

- Current American Society of Reproductive Medicine
- Current American Society of Andrology

### INTERNAL CITIZENSHIP

#### **University Citizenship (BYU)**

- 2022 – Present Member of Research Committee: Internship coordinator (Department of Cell Biology and Physiology, BYU)
- 2021 – Present Member of Genomics Curriculum Committee (College of Life Sciences, BYU)

|                |   |
|----------------|---|
| 2021 – Present | Chair of Marketing Committee (Department of Cell Biology and Physiology, BYU)     |
| 2021 – Present | Member of Search Committee (Department of Cell Biology and Physiology, BYU)       |
| 2021           | Judge for CURA projects (Department of Cell Biology and Physiology, BYU)          |
| 2020 – 2021    | Reviewer of J. Ruben Clark Scholarly Research Grant (BYU)                         |
| 2020           | Reviewer of Turkey Vaccination Research Proposals (College of Life Sciences, BYU) |
| 2019           | Reviewer of CURA Grants (College of Life Sciences, BYU)                           |
| 2019 – Present | Member of Awards Committee (Department of Cell Biology and Physiology, BYU)       |

### **University Citizenship (University of Utah)**

|             |  |
|-------------|--|
| 2017 – 2018 | Member of Admissions Committee (University of Utah School of Medicine) |
|-------------|--|

## **TEACHING / MENTORING EXPERIENCE**

### COURSES TAUGHT

#### **Lecture based courses**

|              |  |
|--------------|--|
| CELL 120     | The Science of Biology (2020 – present): ~150 students per section.                                    |
| CELL 444/445 | Bio-innovations (2021 – present): ~10 students per section. ( <i>Half lecture, half experiential</i> ) |
| CELL 550R    | Epigenetic data analysis (2020 – present): ~10 students per section.                                   |

#### **Experiential based courses**

|           |  |
|-----------|--|
| CELL 295R | Introductory Undergraduate Research (2020 – present)     |
| CELL 450R | Readings in Cell Biology and Physiology (2020 – present) |
| CELL 349R | Cell Biology and Physiology Teaching (2020 – present)    |
| CELL 495R | Advanced Undergraduate Research (2020 – present)         |

### MENTORING EXPERIENCE

#### **Undergraduate students mentored to date (BYU): ~15 students in my lab per semester.**

|                    |                  |                  |
|--------------------|------------------|------------------|
| Mathew Grover      | Chad Pollard     | Sydney Reil      |
| Heather Evans      | Kelaney Stalker  | Carter Norton    |
| Josh Holstrom      | Craig Busch      | Berlin Barnett   |
| Caroline Catterton | Jacob Gneiting   | Kate Hansen      |
| Lily Millar        | Megan Hansen     | Nathanael Taylor |
| Parker Smith       | Preston Moe      | Preston Glade    |
| Robbie Millard     | Eric Clarke      | William Fawcett  |
| Jeff Olsen         | Austen Callister | Matthew Baer     |

### **Graduate students mentored to date (BYU)**

Isaac Stirland – Master (2021 – present)

Ryan Barney – PhD (2020 – present)

Andrew Lutes – Masters (2020 – 2022)

### **Graduate student committees**

2021 – Present Chair, Isaac Stirland, BYU (Masters)

2020 – 2022 Chair, Andrew Lutes, BYU (Masters)

2020 – Present Chair, Ryan Barney, BYU (PhD)

2019 – 2022 Member, Depika Garg, University of Utah (Masters)

2019 – 2020 Member, Alex Jafek, University of Utah (PhD)

2018 – 2020 Member, Marzieh Chaharlang, University of Utah (PhD)

2017 – 2020 Member, Haidong Feng, University of Utah (PhD)

## **ACADEMIC / RESEARCH EXPERIENCE**

### **SCHOLASTIC HONORS**

|             |  |
|-------------|--|
| 2021        | Star Reviewer award from Fertility and Sterility. 2021   |
| 2019        | Star Reviewer award from Fertility and Sterility. 2019   |
| 2018        | Top published paper in 2017 in the Journal of Andrology: Awarded in Budapest, Hungary; Oct, 2018   |
| 2017        | Star Reviewer award from Fertility and Sterility. 2017   |
| 2017        | 2nd Place Prize Poster "Population-based semen analysis result and fertility among men with inflammatory bowel disease: Results from Subfertility Health Assisted Reproduction and the Environment (SHARE) study, at the Utah Chapter Meeting of the American College of Surgeons, Salt Lake City, May 11.   |
| 2016        | 1st Place - American Urological Association: Early Career Investigator Showcase. "Aging and the male gamete."  |
| 2015 - 2017 | NIH LRP Award recipient, National Institute of Child Health and Human Development  |
| 2011        | Excellence in Andrology award, awarded for outstanding patient care and research quality in the Andrology & IVF Laboratories, University of Utah Health Care, Salt Lake City, UT   |
| 2010        | Prize Abstract, International Symposium on the Genetics of Male Infertility, 2010: Hammoud S, Nix D, Jenkins T, Cairns B, Carrell DT (2010): Genome-wide Epigenetic Characterization of Retained Nucleosomes In The Mature Sperm Of patients with Abnormal Protamine Replacement. 4th Utah/Florence International Symposium on the Genetics of Male Infertility, Park City, UT, Feb 4-6, 2010. |

## PUBLICATIONS

### Peer Reviewed Journal Articles

1. Libardi-Miranda-Furtado, C.<sup>#</sup>, Hansen, M.<sup>#</sup>, Kogure, G., Ribeiro, B., Taylor, N., Soares, M., Ferriani, R., Aston, K., **Jenkins, T.\***, Maria dos Reis, R.\*, *Aerobic and Resistance Exercise Intervention Induces Differential DNA Methylation in Women with Polycystic Ovary Syndrome*. 2022. (Under review in Cell Metabolism) # designates shared 1<sup>st</sup> authorship, \* designates shared senior authorship.
2. Miller, R.H., C.A. Pollard, K.R. Brogaard, A.C. Olson, L.I. Lipshultz, E.B. Johnstone, Y.O. Ibrahim, J.M. Hotaling, E.F. Schisterman, and S.L. Mumford, K.A. Aston, **T.G. Jenkins**, *A tissue specific atlas of gene promoter DNA methylation variability and the clinical value of its assessment*. bioRxiv, 2022. (Under review in Genome Biology)
3. Garg, D., Lomo, L., Aston, K., Reil, S., Hodgeman, M., Hill, J., Johnstone, E., **Jenkins, T.**, Letourneau, J., *Effect of Chemotherapy on the Uterus of Young Adult Cancer Survivors*. Fertility and Sterility Reports. 2022, (accepted for publication; In Press)
4. **Jenkins, T.**, K. Aston, D. Carrell, E. DeVilbiss, L. Sjaarda, N. Perkins, J.L. Mills, Z. Chen, A. Sparks, T. Clemons, K. Chaney, C.M. Peterson, B. Emery, J. Hotaling, E. Johnstone, E. Schisterman, and S.L. Mumford, *The impact of zinc and folic acid supplementation on sperm DNA methylation: results from the folic acid and zinc supplementation randomized clinical trial (FAZST)*. Fertil Steril, 2022. 117(1): p. 75-85.
5. Barney, R., K. Stalker, A. Lutes, A. Bayles, K. Aston, and **T. Jenkins**, *Assessment of seminal cell-free DNA as a potential contaminate in studies of human sperm DNA methylation*. Andrology, 2022. 10(4): p. 702-709.
6. Schuller, A., C. Bellini, **T.G. Jenkins**, M. Eden, J. Matz, J. Oakes, and L. Montrose, *Simulated Wildfire Smoke Significantly Alters Sperm DNA Methylation Patterns in a Murine Model*. Toxics, 2021. 9(9): p. 199.
7. Salas-Huetos, A., L. Maghsoumi-Norouzabad, E.R. James, D.T. Carrell, K.I. Aston, **T.G. Jenkins**, N. Becerra-Tomás, A.Z. Javid, R. Abed, and P.J. Torres, *Male adiposity, sperm parameters and reproductive hormones: An updated systematic review and collaborative meta-analysis*. Obesity Reviews, 2021. 22(1): p. e13082.
8. Salas-Huetos, A., E.R. James, J. Salas-Salvadó, M. Bulló, K.I. Aston, D.T. Carrell, and **T.G. Jenkins**, *Sperm DNA methylation changes after short-term nut supplementation in healthy men consuming a Western-style diet*. Andrology, 2021. 9(1): p. 260-268.
9. Goodrich, J.M., M.A. Furlong, A.J. Caban-Martinez, A.M. Jung, K. Batai, **T. Jenkins**, S. Beitel, S. Littau, J. Gulotta, D. Wallentine, J. Hughes, C. Popp, M.M. Calkins, and J.L. Burgess, *Differential DNA Methylation by Hispanic Ethnicity Among Firefighters in the United States*. Epigenetics Insights, 2021. 14.

10. Goodrich, J.M., M.M. Calkins, A.J. Caban-Martinez, T. Stueckle, C. Grant, A.M. Calafat, A. Nematollahi, A.M. Jung, J.M. Graber, **T. Jenkins**, A.L. Slitt, A. Dewald, J. Cook Botelho, S. Beitel, S. Littau, J. Gulotta, D. Wallentine, J. Hughes, C. Popp, and J.L. Burgess, *Per- and polyfluoroalkyl substances, epigenetic age and DNA methylation: a cross-sectional study of firefighters*. *Epigenomics*, 2021. 13(20): p. 1619-1636.
11. Feng, H., A. Jafek, R. Samuel, J. Hotaling, **T.G. Jenkins**, K.I. Aston, and B.K. Gale, *High efficiency rare sperm separation from biopsy samples in an inertial focusing device*. *Analyst*, 2021. 146(10): p. 3368-3377.
12. Santana, V.P., E.R. James, C.L. Miranda-Furtado, M.F. de Souza, C.P. Pompeu, S.C. Esteves, D.T. Carrell, K.I. Aston, **T.G. Jenkins\***, and R.M. Dos Reis\*, *Differential DNA methylation pattern and sperm quality in men with varicocele*. *Fertility and Sterility*, 2020. 114(4): p. 770-778. (\*Shared Senior authorship)
13. Samuel, R., J. Son, **T.G. Jenkins**, A. Jafek, H. Feng, B.K. Gale, D.T. Carrell, and J.M. Hotaling, *Microfluidic system for rapid isolation of sperm from microdissection TESE specimens*. *Urology*, 2020. 140: p. 70-76.
14. Salas-Huetos, A., E.R. James, K.I. Aston, D.T. Carrell, **T.G. Jenkins**, and M. Yeste, *The role of miRNAs in male human reproduction: A systematic review*. *Andrology*, 2020. 8(1): p. 7-26.
15. Salas-Huetos, A., E.R. James, D.S. Broberg, K.I. Aston, D.T. Carrell, and **T.G. Jenkins**, *The combined effect of obesity and aging on human sperm DNA methylation signatures: inclusion of BMI in the paternal germ line age prediction model*. *Scientific Reports*, 2020. 10(1): p. 1-6.
16. Nwanaji-Enwerem, J.C., **T.G. Jenkins**, E. Colicino, A. Cardenas, A.A. Baccarelli, and E.W. Boyer, *Serum dioxin levels and sperm DNA methylation age: Findings in Vietnam war veterans exposed to Agent Orange*. *Reproductive Toxicology*, 2020. 96: p. 27-35.
17. Murphy, P.J., J. Guo, **T.G. Jenkins**, E.R. James, J.R. Hoidal, T. Huecksteadt, D.S. Broberg, J.M. Hotaling, D.F. Alonso, and D.T. Carrell, *NRF2 loss recapitulates heritable impacts of paternal cigarette smoke exposure*. *Plos Genetics*, 2020. 16(6): p. e1008756.
18. Jafek, A., H. Feng, D. Broberg, B. Gale, R. Samuel, K. Aston, and **T. Jenkins**, *Optimization of Dean flow microfluidic chip for sperm preparation for intrauterine insemination*. *Microfluidics and Nanofluidics*, 2020. 24(8): p. 1-9.
19. Jafek, A., H. Feng, H. Brady, K. Petersen, M. Chaharlang, K. Aston, B. Gale, **T. Jenkins**, and R. Samuel, *An automated instrument for intrauterine insemination sperm preparation*. *Scientific reports*, 2020. 10(1): p. 1-9.
20. Hanson, B.M., X. Tao, Y. Zhan, **T.G. Jenkins**, S.J. Morin, R.T. Scott, and E.U. Seli, *Young women with poor ovarian response exhibit epigenetic age acceleration based on evaluation of white blood cells using a DNA methylation-derived age prediction model*. *Human Reproduction*, 2020. 35(11): p. 2579-2588.
21. Zhou, J., **T.G. Jenkins**, A.M. Jung, K.S. Jeong, J. Zhai, E.T. Jacobs, S.C. Griffin, D. Dearmon-Moore, S.R. Littau, and W.F. Peate, *DNA methylation among firefighters*. *PLoS one*, 2019. 14(3): p. e0214282.

22. Salas-Huetos, A., E.R. James, K.I. Aston, **T.G. Jenkins**, D.T. Carrell, and M. Yeste, *The Expression of miRNAs in Human Ovaries, Oocytes, Extracellular Vesicles, and Early Embryos: A Systematic Review*. *Cells*, 2019. 8(12): p. 1564.
23. Murphy, P.J., J. Guo, **T.G. Jenkins**, J.R. Hoidal, T. Huecksteadt, J. Hotaling, D.T. Carrell, B.R. Cairns, and K.I. Aston, *Cigarette smoke-induced oxidative stress alters DNA methylation patterns in sperm and neurological gene expression patterns in offspring*. *Fertility and Sterility*, 2019. 112(3): p. e337.
24. **Jenkins, T.G.**, E.R. James, K.I. Aston, A. Salas-Huetos, A.W. Pastuszak, K.R. Smith, H.A. Hanson, J.M. Hotaling, and D.T. Carrell, *Age-associated sperm DNA methylation patterns do not directly persist trans-generationally*. *Epigenetics & Chromatin*, 2019. 12(1): p. 1-8.
25. Hanson, B.M., X. Tao, Y. Zhan, **T.G. Jenkins**, J.G. Kim, E.K. Osman, A.W. Tiegs, S.A. Neal, R.T. Scott, and E. Seli, *The relationship between chronologic age, ovarian response, and DNA methylation of white blood cells and cumulus cells among infertile women undergoing IVF*. *Fertility and Sterility*, 2019. 112(3): p. e33-e34.
26. Samuel, R., N. Miller, O. Badamjav, **T. Jenkins**, D. Carrell, J. Hotaling, and B.K. Gale, *Design and operation of a microfluidic chip for trapping, and off-chip collection of a few human sperm*. *Journal of Micromechanics and Microengineering*, 2018. 28(9): p. 097002.
27. Keihani, S., J.R. Craig, C. Zhang, A.P. Presson, J.B. Myers, W.O. Brant, K.I. Aston, B.R. Emery, **T.G. Jenkins**, and D.T. Carrell, *Proton-pump inhibitor use does not affect semen quality in subfertile men*. *Asian journal of andrology*, 2018. 20(3): p. 290.
28. **Jenkins, T.G.**, L. Liu, K.I. Aston, and D.T. Carrell, *Pre-screening method for somatic cell contamination in human sperm epigenetic studies*. *Systems biology in reproductive medicine*, 2018. 64(2): p. 146-155.
29. **Jenkins, T.G.**, K.I. Aston, B. Cairns, A. Smith, and D.T. Carrell, *Paternal germ line aging: DNA methylation age prediction from human sperm*. *Bmc Genomics*, 2018. 19(1): p. 1-10.
30. Hanson, B.M., K.I. Aston, **T.G. Jenkins**, D.T. Carrell, and J.M. Hotaling, *The impact of ejaculatory abstinence on semen analysis parameters: a systematic review*. *Journal of assisted reproduction and genetics*, 2018. 35(2): p. 213-220.
31. Keihani, S., J.R. Craig, C. Zhang, A.P. Presson, J.B. Myers, W.O. Brant, K.I. Aston, B.R. Emery, **T.G. Jenkins**, and D.T. Carrell, *Impacts of Abstinence Time on Semen Parameters in a Large Population-based Cohort of Subfertile Men*. *Urology*, 2017. 108: p. 90-95.
32. **Jenkins, T.**, E. James, D. Alonso, J. Hoidal, P. Murphy, J. Hotaling, B. Cairns, D. Carrell, and K. Aston, *Cigarette smoking significantly alters sperm DNA methylation patterns*. *Andrology*, 2017. 5(6): p. 1089-1099.
33. Patel, B., E. Johnstone, A. Presson, C. Zhang, **T. Jenkins**, K. Aston, D. Carrell, and J. Hotaling, *The effect of ADHD medications on semen analysis in sub-fertile couples*. *Fertility and Sterility*, 2016. 106(3): p. e234.
34. **Jenkins, T.G.**, K.I. Aston, T.D. Meyer, J.M. Hotaling, M.B. Shamsi, E.B. Johnstone, K.J. Cox, J.B. Stanford, C.A. Porucznik, and D.T. Carrell, *Decreased fecundity and sperm DNA methylation patterns*. *Fertility and sterility*, 2016. 105(1): p. 51-57. e3.

35. **Jenkins, T.**, K. Aston, J. Hotaling, M. Shamsi, L. Simon, and D. Carrell, *Teratozoospermia and asthenozoospermia are associated with specific epigenetic signatures*. *Andrology*, 2016. 4(5): p. 843-849.
36. **Jenkins, T.G.**, K.I. Aston, C. Trost, J. Farley, J.M. Hotaling, and D.T. Carrell, *Intra-sample heterogeneity of sperm DNA methylation*. *Mhr: Basic science of reproductive medicine*, 2015. 21(4): p. 313-319.
37. Ge, S., L. Liu, K. Aston, L. Simon, **T. Jenkins**, B. Emery, and D. Carrell, *Associations of single nucleotide polymorphisms in the Pygo2 coding sequence with idiopathic oligospermia and azoospermia*. *Genet Mol Res*, 2015. 14(3): p. 9053-9061.
38. Aston, K.I., P.J. Uren, **T.G. Jenkins**, A. Horsager, B.R. Cairns, A.D. Smith, and D.T. Carrell, *Aberrant sperm DNA methylation predicts male fertility status and embryo quality*. *Fertility and sterility*, 2015. 104(6): p. 1388-1397. e5.
39. **Jenkins, T.G.**, K.I. Aston, C. Pflueger, B.R. Cairns, and D.T. Carrell, *Age-associated sperm DNA methylation alterations: possible implications in offspring disease susceptibility*. *PLoS genetics*, 2014. 10(7): p. e1004458.
40. **Jenkins, T.G.**, K.I. Aston, B.R. Cairns, and D.T. Carrell, *Paternal aging and associated intraindividual alterations of global sperm 5-methylcytosine and 5-hydroxymethylcytosine levels*. *Fertility and sterility*, 2013. 100(4): p. 945-951. e2.
41. **Jenkins, T.G.**, K.I. Aston, and D.T. Carrell, *Supplementation of cryomedium with ascorbic acid–2-glucoside (AA2G) improves human sperm post-thaw motility*. *Fertility and sterility*, 2011. 95(6): p. 2001-2004.

#### Peer Reviewed Review Articles

1. Pollard, C.A. and **T.G. Jenkins**, *Epigenetic mechanisms within the sperm epigenome and their diagnostic potential*. *Best Practice & Research Clinical Endocrinology & Metabolism*, 2020. 34(6): p. 101481.
2. Patel, D.P., **T.G. Jenkins**, K.I. Aston, J. Guo, A.W. Pastuszak, H.A. Hanson, and J.M. Hotaling, *Harnessing the full potential of reproductive genetics and epigenetics for male infertility in the era of “big data”*. *Fertility and sterility*, 2020. 113(3): p. 478-488.
3. Mangum, C.L., D.P. Patel, A.R. Jafek, R. Samuel, **T.G. Jenkins**, K.I. Aston, B.K. Gale, and J.M. Hotaling, *Towards a better testicular sperm extraction: novel sperm sorting technologies for non-motile sperm extracted by microdissection TESE*. *Translational Andrology and Urology*, 2020. 9(Suppl 2): p. S206.
4. James, E.R., D.T. Carrell, K.I. Aston, **T.G. Jenkins**, M. Yeste, and A. Salas-Huetos, *The Role of the Epididymis and the Contribution of Epididymosomes to Mammalian Reproduction*. *International Journal of Molecular Sciences*, 2020. 21(15): p. 5377.
5. Salas-Huetos, A., E.R. James, K.I. Aston, **T.G. Jenkins**, and D.T. Carrell, *Diet and sperm quality: Nutrients, foods and dietary patterns*. *Reproductive Biology*, 2019. 19(3): p. 219-224.
6. Mangum, C.L., D.P. Patel, A.R. Jafek, R. Samuel, **T.G. Jenkins**, K.I. Aston, B.K. Gale, and J.M. Hotaling, *Towards a better testicular sperm extraction (TESE): novel sperm sorting technologies for non-motile sperm extracted by microdissection TESE*. *Transl. Androl. Urol*, 2019. 10.
7. Samuel, R., H. Feng, A. Jafek, D. Despain, **T. Jenkins**, and B. Gale, *Microfluidic—based sperm sorting & analysis for treatment of male infertility*. *Translational andrology and urology*, 2018. 7(Suppl 3): p. S336.



8. **Jenkins, T.G.** and D.T. Carrell, *Epigenetics and Sperm Abnormalities*. 2018.
9. **Jenkins, T.G.**, K.I. Aston, and D.T. Carrell, *Sperm epigenetics and aging*. *Translational andrology and urology*, 2018. 7(Suppl 3): p. S328.
10. James, E. and **T.G. Jenkins**, *Epigenetics, infertility, and cancer: future directions*. *Fertility and sterility*, 2018. 109(1): p. 27-32.
11. **Jenkins, T.G.**, K.I. Aston, E.R. James, and D.T. Carrell, *Sperm epigenetics in the study of male fertility, offspring health, and potential clinical applications*. *Systems biology in reproductive medicine*, 2017. 63(2): p. 69-76.
12. Craig, J.R., **T.G. Jenkins**, D.T. Carrell, and J.M. Hotaling, *Obesity, male infertility, and the sperm epigenome*. *Fertility and Sterility*, 2017. 107(4): p. 848-859.
13. **Jenkins, T.G.** and D.T. Carrell, *The sperm epigenome and potential implications for the developing embryo*. *Reproduction*, 2012. 143(6): p. 727.
14. **Jenkins, T.** and D.T. Carrell, *Dynamic alterations in the paternal epigenetic landscape following fertilization*. *Frontiers in genetics*, 2012. 3: p. 143.
15. **Jenkins, T.G.** and D.T. Carrell, *The paternal epigenome and embryogenesis: poisoning mechanisms for development*. *Asian journal of andrology*, 2011. 13(1): p. 76.

#### Peer Reviewed Invited Book Chapters

1. Barney, R.C. and **T.G. Jenkins**, *Sperm epigenetics: The future of precision medicine in male infertility*, in *Epigenetics in Precision Medicine*. 2022, Elsevier. p. 369-380.
2. James, E.R., A. Salas-Huetos, A.R. Gostick, D.T. Carrell, K.I. Aston, and **T.G. Jenkins**, *Aging of male and female gametes*, in *Epigenetics and Reproductive Health*. 2021, Academic Press. p. 253-267.
3. **Jenkins, T.G.** and P.J. Turek, *Epigenetics and Male Infertility*, in *Male Infertility*. 2020, Springer. p. 139-146.
4. James, E.R., **T.G. Jenkins**, and D.T. Carrell, *The Sperm Epigenome and Potential Implications for the Developing Embryo*, in *Genetics of Male Infertility*. 2020, Springer. p. 173-185.
5. Grover, M.M. and **T.G. Jenkins**, *Transgenerational epigenetics: A window into paternal health influences on offspring*. *Urologic Clinics*, 2020. 47(2): p. 219-225.
6. Carrell, D.T., **T.G. Jenkins**, B.R. Emery, J.M. Hotaling, and K.I. Aston, *The Role of Reproductive Genetics in Modern Andrology*, in *Intracytoplasmic Sperm Injection*. 2018, Springer. p. 23-38.
7. **Jenkins, T.G.** and D.T. Carrell, *Sperm Epigenome*. *The Sperm Cell: Production, Maturation, Fertilization, Regeneration*, 2017. 9: p. 230.
8. Murphy, K.E., **T.G. Jenkins**, and D.T. Carrell, *How the father might epigenetically program the risk for developmental origins of health and disease effects in his offspring*, in *The Epigenome and Developmental Origins of Health and Disease*. 2016, Elsevier. p. 361-375.
9. **Jenkins, T.G.**, K.I. Aston, T. Meyer, and D.T. Carrell, *The sperm epigenome, male aging, and potential effects on the embryo*, in *The Male Role in Pregnancy Loss and Embryo Implantation Failure*. 2015, Springer. p. 81-93.
10. Gannon, J.R., B.R. Emery, **T.G. Jenkins**, and D.T. Carrell, *The sperm epigenome: implications for the embryo*, in *Genetic Damage in Human Spermatozoa*. 2014, Springer. p. 53-66.

11. **Jenkins, T.G.**, K.I. Aston, and D.T. Carrell, *The Aging Male and Impact on Offspring, in Biennial Review of Infertility*. 2013, Springer. p. 17-29.
12. **Jenkins, T.G.**, B.R. Emery, and D.T. Carrell, *Assays used in the study of sperm nuclear proteins, in Sperm Chromatin*. 2011, Springer. p. 233-241.

#### Invited Editorials

1. Patel, D.P., **T.G. Jenkins**, and J.M. Hotaling, *Microfluidics: a way to interrogate a single sperm?* Fertility and sterility, 2019. 112(5): p. 808.
2. **Jenkins, T.G.**, *Semen parameter decline with advancing age: a cause for concern?* Fertility and sterility, 2018. 110(1): p. 54-55.
3. James, E., **T. Jenkins**, J. Hotaling, N. Laufer, Z. Rosenwaks, H. Daum, T. Peretz, B. Hanson, M. Eisenberg, and L. Nagirnaja, *FERTILITY AND STERILITY: 50 YEARS AGO TODAY*. 2018.
4. **Jenkins, T.G.**, *Semen characteristics and pregnancy loss: an important step in addressing a complex problem*. Fertility and sterility, 2017. 108(4): p. 598-599.
5. Hotaling, J.M. and **T.G. Jenkins**, *MicroRNA: a step beyond bulk seminal parameters?* Fertility and sterility, 2015. 104(3): p. 554.

#### POSTER AND ORAL ABSTRACT PRESENTATIONS

##### Recently Published Abstracts from Society Meetings (past three years)

1. Pollard, C., R. Miller, **T. Jenkins**, and K. Brogaard, PD36-07 *DISCOVERY OF A EPIGENETIC BIOMARKER PREDICTIVE OF MALE INFERTILITY*. The Journal of Urology, 2022. 207(Supplement 5): p. e635.
2. Saito, J., E. Saito, J. Arroyo, P. Reynolds, **T. Jenkins**, and B. Bikman, *Exposure to e-cigarette smoke enhances sperm mitochondrial respiration in mature mice*. The FASEB Journal, 2021. 35.
3. Liu, L., K.I. Aston, and **T.G. Jenkins**, *ASSESSMENT OF AGE-ASSOCIATED SPERM DNA METHYLATION ALTERATION INHERITANCE IN 4 CELL MOUSE EMBRYOS*. Fertility and Sterility, 2021. 116(3): p. e333.
4. Garg, D., **T.G. Jenkins**, E. Johnstone, K.I. Aston, and J.M. Letourneau, *EFFECT OF ALKYLATING AGENT CHEMOTHERAPY ON THE UTERUS OF YOUNG ADULT CANCER SURVIVORS*. Fertility and Sterility, 2021. 116(3): p. e474.
5. Evans, H. and **T. Jenkins**, *The Reliability of Sperm Epigenetic Age Associations with Semen and Embryo Quality*. 2021.
6. Jafek\*, A., H. Feng, **T. Jenkins**, K. Aston, D. Carrell, B. Gale, R. Samuel, and J. Hotaling, PD34-07 *A NOVEL MICROFLUIDIC DEVICE TO IMPROVE SPERM SEARCHING IN MICRODISSECTION TESE SAMPLES*. The Journal of Urology, 2019. 201(Supplement 4): p. e647-e648.
7. Jafek\*, A., H. Brady, H. Feng, J. Hotaling, D. Carrell, B. Gale, R. Samuel, K. Aston, and **T. Jenkins**, MP52-05 *RAPID MICROFLUIDIC SPERM PREPARATION FOR INTRAUTERINE INSEMINATION*. The Journal of Urology, 2019. 201(Supplement 4): p. e767-e767.
8. Anderson, R., H. Hanson, C. Zhang, A. Presson, M. Kingsbury, **T. Jenkins**, K. Smith, and J. Hotaling\*, MP46-01 *THE INITIAL MALE INFERTILITY EVALUATION AND PREGNANCY–WHAT REALLY MATTERS? A STUDY FROM THE UTAH*

**Oral Presentation of Abstracts at Society Meetings (Jenkins as presenter)**

1. 2018 - The diagnostic potential and clinical utility of sperm epigenetic analysis. American Urological Association Annual Meeting; San Francisco, CA; May 18-20.
2. 2018 - Semen Analysis and Sperm function. Annual Meeting of the American Society of Andrology Basic Science Workshop, Portland, OR April 21.
3. 2016 - Jenkins TG. Aging and the male gamete. 1st Place Prize, Early Career Investigator Showcase American Urological Association Annual Meeting, San Diego, CA.
4. 2015 - Jenkins TG, Aston KI, Hotaling JM, Carrell DT. Cigarette smoking and the sperm epigenome. American Society of Andrology Annual Meeting, Salt Lake City, UT
5. 2014 - Smith A, Aston KI, Uren PJ, Jenkins TG, Carrell DT. Sperm DNA methylation patterns are highly predictive of fertility status and may be prognostic for IVF embryo quality. American Society for Reproductive Medicine Annual Meeting, Honolulu, HI
6. 2014 - Jenkins TG, Aston KI, Pflueger C, Cairns BR, Carrell DT. Next Generation Bisulfite Sequencing Reveals Consistent Population-Wide Regional Sperm DNA Methylation Alterations with Age. American Society for Reproductive Medicine Annual Meeting, Honolulu, HI
7. 2013 - Jenkins T, Aston KI, Carrell DT. Regional enrichment of altered sperm DNA methylation marks associated with paternal aging. American Society of Reproductive Medicine Annual Meeting, Boston, MA
8. 2012 - Jenkins T, Aston KI, Carrell DT. Intra-individual variability of global sperm 5-methylcytosine and 5-hydroxymethylcytosine levels between ejaculates. American Society of Reproductive Medicine Annual Meeting, San Diego, CA

INVITED/VISITING PROFESSOR PRESENTATIONS

**International**

1. 2022 – Science and Religion: A Biology Professor’s Prospective. Cardiff, Wales, July 2022
2. 2021 - The utility of DNA methylation and targeted ‘cell of origin’ analysis in the care for azoospermic patients. Society for Reproductive Biology (Australia), Melbourne, Australia (Via Zoom), October 2021
3. 2018 - Cigarette Smoking and Sperm Epigenetic Signatures. European Congress of Andrology; Budapest, Hungary; October 2018
4. 2015 - Jenkins TG. Epigenetics in Spermatogenesis. EDMaRC Workshop, Copenhagen, Denmark

**Domestic**

1. 2022 - DNA methylation instability and targeted 'cell of origin' analysis: future tools for complex disease diagnosis. Biological Sciences Seminar Series, Boise State University, Boise, ID March 2022.
2. 2021 – Epigenetics and infertility. Infertility Unfiltered lecture series. Repeated quarterly via Zoom with couples in infertility care across the US.
3. 2021 - Sperm epigenetics and complex disease. Society of epidemiological research annual symposium, San Diego, CA June 2021.
4. 2021 - Non-Obstructive Azoospermia treatment in the laboratory. American Society of Andrology annual meeting (virtual). April 2021
5. 2021 - Epigenetic links between parent and child in infertility care, Infertilityunfiltered.com, Webinar with couples in southern California, Feb. 2021
6. 2018 - State of Male Infertility Diagnosis and Treatment: Where Do We Go From here? Ohana Biosciences, Cambridge, MA, May 25.
7. 2017 - Germline epigenetics: Potential Diagnostic Utility for Fertility, Embryogenesis, and Offspring Health, at the Third Annual Reproductive Genetic Diagnostics Conference, Cambridge MA, November 30.
8. 2016 - Jenkins TG, using sperm epigenetic data in the clinic: promises and perils. American Urologic Association SBUR 2016 Summer Research Conference, Linthicum, MD, July 1.
9. 2016 - Jenkins TG. Strategies for investigating the sperm epigenome. American Society of Andrology Basic Science Workshop, New Orleans, LA

#### **Local / Regional**

1. 2019 - Sperm DNA methylation and aging. Predictive Laboratories, Salt Lake City, UT
2. 2019 - The methodology and utility of identifying subtle DNA methylation differences in human disease. Illumina Genomics Symposium, Salt Lake City UT
3. 2019 - A father's Unexpected Legacy: Cause and consequence of sperm epigenetic alterations. Presented at Brigham Young University: Physiology and Developmental Biology Department Seminar, Provo UT
4. 2018 - Epigenetics and predictive analytics: steps toward improving fertility diagnostics. Department of Surgery: Basic Science Research Section Meeting, Salt Lake City, UT
5. 2017 - Understanding the biological impact of fathers. Department of Surgery: Basic Science Research Section. Salt Lake City, UT
6. 2017 - Sperm epigenetics and the paternal age effect. Urology Conference. Salt Lake City, UT
7. 2016 - The sperm epigenome: Implications in embryogenesis and offspring health. Brigham Young University Research Seminar, Provo, UT
8. 2016 - The sperm epigenome: Male Infertility. Utah Infertility Conference, Sandy, UT

#### **OTHER ACADEMIC / RESEARCH PRODUCTS**

##### **Patents**

1. 2022 – Pollard, C., **Jenkins, T.**, (BYU). *Nueronal cfDNA found in blood plasma as a diagnostic marker of neurodegenerative disease*. (Licensed by Resonant Biosciences).

2. 2021 – Barney, R., **Jenkins, T.**, (BYU). *Seminal cfDNA analysis to determine cell of origin*. (Licensed by Inherent Biosciences).
3. 2021 – Gale, B., A. Jafek, H. Feng, **T. Jenkins**, and K. Aston, (U of U) *Rapid sperm separation based on sperm morphology and motility*.
4. 2019 – Carrell D., Cairns, B., **Jenkins T.**, Aston, K., (U of U) *Methods of identifying male fertility and embryo quality*.
5. 2019 – Samuel, R., B. Gale, A. Jafek, **T. Jenkins**, J. Hotaling, D. Carrell, and J. Son, (U of U) *Microfluidic system for sperm separation and enrichment from various types of sperm samples*.
6. 2016 – Carrell, D., Cairns, B., **Jenkins, T.**, Aston, KI (U of U). *Systems and Methods for Determining Impact of Age-Related Changes in Sperm Epigenome on Offspring Phenotype*.

## FUDNING

### **Current funding**

01/01/21 – 08/01/22      Translational Medial Fund Award  
 PI: Tim Jenkins  
 Direct Costs: \$35,500  
 BYU Tech Transfer office

### **Past funding**

08/30/19 - 07/31/21      Sperm sample preparation for point of care applications (Phase II SBIR)  
 PI: Tim Jenkins; Raheel Samuel  
 Direct Costs: 1,000,000  
 NICHD

04/20/18 - 09/30/18      Sperm sample preparation for point of care applications (Phase I SBIR)  
 Principal Investigator(s): Tim Jenkins; Raheel Samuel  
 Direct Costs: \$173,508 Total Costs: \$223,823  
 NICHD  
 Role: Co-Principal Investigator

07/01/17 - 06/30/19      New Investigator Grant: The effect of aging on the mammalian sperm epigenome and implication in embryogenesis  
 Principal Investigator(s): Tim Jenkins  
 Direct Costs: \$44,000 Total Costs: \$44,000  
 Role: Principal Investigator

01/01/16 - 12/31/17      Development of a Novel Microfluidics Device to Optimize Sperm Retrieval and Storage from Microsurgical Testicular Sperm Extraction and Storage from Microsurgical Testicular Sperm Extraction  
 Principal Investigator(s): Raheel Samuel

National Science Foundation  
Role: Co-Investigator  
02/04/15 - 01/31/18 Transgenerational Effects of Smoking-Induced Changes to Sperm  
DNA Methylation  
Principal Investigator(s): Brad Cairns; Kenneth Aston  
NICHD  
Role: Key Personnel  
09/10/14 - 05/31/19 Genomics of Spermatogenetic Impairment  
Principal Investigator(s): Don Conrad; Kenneth Aston  
NICHD  
Role: Key Personnel