NOMINATION SIGNATURE PAGE

2024 Virginia Outstanding Faculty Awards

Nominations <u>must</u> include this as the cover page of the nomination package PDF submission

Name of Applicant:	Timothy Jarome, PhD
Institution:	Virginia Tech
Category (choose only one): • Baccalaureate Institution • Masters/Comprehensive Institution • Research/Doctoral Institution • Two-Year Institution • Rising Star	Rising Star
Signature of President or Chief Academic Officer:	*Cyril R. Clarke*
Printed Name of President or Chief Academic Officer:	Cyril R. Clarke
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Telephone number of President or Chief Academic Officer:	(540)231-6123

MISSION STATEMENT

Inspired by our land-grant identity and guided by our motto, Ut Prosim (That I May Serve), Virginia Tech is an inclusive community of knowledge, discovery, and creativity dedicated to improving the quality of life and the human condition within the Commonwealth of Virginia and throughout the world.

SUMMARY OF ACCOMPLISHMENTS

Dr. Timothy Jarome is an Associate Professor in the School of Animal Sciences at Virginia Tech, where he also holds appointments as Core Faculty in the School of Neuroscience and Faculty of Health Sciences. Tim is a recognized leader in biomedical research, teaching, mentorship and scholarship. Tim joined Virginia Tech at the beginning of 2018 after completing his Ph.D. at the University of Wisconsin-Milwaukee (2013) and postdoctoral training at the University of Alabama at Birmingham School of Medicine (2017). Motivated by the prevalence of anxiety disorders in his family, Tim has spent his career elucidating the molecular and cellular mechanisms controlling the formation of fear-based memories for traumatic events, such as those that underlie post-traumatic stress disorder (PTSD), which is a debilitating anxiety disorder that affects more than 6 million Americans. Thus, his work has important implications for understanding not only the pathophysiology of PTSD but also other anxiety disorders, which could lead to the development of novel therapeutic strategies to treat these disorders are that widely prevalent in the U.S. population. To this end, Tim is extremely accomplished for this stage of his career and has already made significant contributions to our understanding of the molecular mechanisms that may control the well-known sex bias that exists in PTSD – which is 2-3 times more common in women than men. However, Tim's accomplishments extend beyond that of his research, as he also has a significant passion for teaching and mentorship, as well as a keen interest in leadership that is already starting to emerge at the early stages of his career. Thus, Tim is excelling in all areas of his position and has a significant upward career trajectory.

Tim's research accomplishments have been incredible since joining Virginia Tech. He quickly established a highly productive research program focusing on sex differences in the molecular mechanisms of fear memory formation as well as memory loss across the lifespan, which has already led to securing of **8** research grants from the National Institute of Mental Health (NIMH) and the National Institute of Aging (NIA), all as the Principal Investigator. This includes 1 R01 and 7 R21 grants, totaling over $5 million in research funding to his lab. These grants have spanned a range of topics including sex differences in PTSD, mechanisms of age-related memory loss and Alzheimer's disease, the latter of which includes the development of the first pig model of Alzheimer's disease that could have significant potential for accelerating drug discovery for this highly prevalent neurodegenerative disease. Notable is that Tim also received funding for his lab's work on obesity, a newer topic that his group has begun studying, which came from the Virginia Commonwealth Health Research Board. Further, Tim is a Co-Investigator on a Department of Defense grant to Virginia Tech, as well as a NIMH R01 grant to the University of Wisconsin-Milwaukee (PI: Karyn Frick). Altogether, this has resulted in over $5.8 million dollars in funding to Tim's lab since 2018 and $6.2 million over his career. In summary, Tim's accomplishments in grantsmanship far exceed the typical amount for someone at this stage of their career and he has already shown clear demonstration of sustained research funding, sometime rarely seen so early in a young faculty member's career. Further, these grants have led to the publication of **high impact** research, most notably from the recent publication from his lab showing a specific molecular mechanism that selectively regulates fear memory formation in females. This work received significant media attention, resulting in live interviews throughout Roanoke and Washington D.C., and numerous commentaries across social media and science and medical news outlets around the world.

Outside of his research, Tim is also accomplished in teaching, mentorship and service. In terms of teaching, Tim is highly regarded by his students in classes he teaches at the undergraduate and graduate level across two departments, though the students that take his classes represent at least 7-8 departments/programs on campus. For mentorship, Tim's undergraduate and graduate students are leaving the lab with accomplishments that far outweigh those of their peers, particularly when it comes to publications with his Ph.D. students graduating having an average of 12 publications from their time at Virginia Tech. Further, Tim has built a highly diverse and

inclusive environment in his lab, where 5 of his 6 graduate students come from underrepresented backgrounds in science and several of these students have been supported by prestigious diversity supplement grants from the National Institutes of Health (NIH). This success continues into his service, where Tim serves as a reviewer for more than 65 scientific journals, has served on numerous grant review panels for the U.S. and other countries, and is currently director for a major interdisciplinary graduate program on campus and was recently appointed as the vice chair for the Institutional Biosafety Committee (IBC) at Virginia Tech.

TEACHING: **From neuroscience and genetics to grant writing and mentorship**
A major area of achievement for Tim is in student mentoring and teaching. For teaching, at the undergraduate level Tim has been teaching Genetics in Neuroscience (NEUR 4314) every fall since 2019, while at the graduate level he teaches Advanced Genetics in Neuroscience (NEUR 5314G) and Writing Fellowship Grant Proposals (APSC 5604), the latter of which is a course that he fully developed during his time at Virginia Tech (did not previously exist). Further, while NEUR 4314/5314G did exist prior to Tim starting at Virginia Tech, they had never been taught before so he largely developed this dual taught course as well. Tim has received extremely positive reviews from students, which is represented on his SPOT scores of ~5.72 for the undergraduate course and ~6.0 for the graduate courses. Students in these courses have consistently reported that Tim makes even the most difficult material accessible to all and shows clear knowledge and passion for the content that he is teaching. Notable is that at the graduate level Tim designed his grant writing course so that students from diverse disciplines can benefit from the same material. This is evident in that students who have taken this course come from many different departments/programs including those that are biomedical (target NIH), agricultural (target USDA), basic science (target NSF) or have broader applications to U.S. defense (DoD).

For mentorship, Tim has been highly prolific in training of *both* graduate and undergraduate students in the lab. At the graduate level, team has trained 1 M.S. and 5 Ph.D. students, 5 of which have come from underrepresented backgrounds in science, and served on more than 21 other thesis/dissertation committees as a member. All graduate students directly under Tim's mentorship have exceeded all expectations and the 4 that have or are about to graduate (1 M.S., 3 Ph.D.) all have significant records of accomplishments. Further, all 4 of these students have obtained employment **in their desired career path** after graduation, showing that Tim focuses his mentorship on the needs of the student. At the undergraduate level Tim has trained 30 undergraduate students in the lab. Those that have graduated have moved on to M.D., Ph.D., combined M.D./Ph.D. or PharmD programs or research or clinical technician positions, many at some of the most prestigious universities in the country. Thus, Tim has prided himself on being an effective teacher (instructor) and mentor, which is shown in the success of his former and current students.

DISCOVERY: Interdisciplinary research on PTSD, Alzheimer's disease and memory loss across the lifespan
Tim has established a highly productive research program that focuses on elucidating the molecular mechanisms regulating the formation of fear memories that underlie PTSD and how these vary by sex. Further, his research program has broad implications as it also now studies the molecular mechanisms controlling memory loss across the lifespan, as well as developing novel animal models of Alzheimer's disease to accelerate drug discovery efforts. In terms of the former, work from Tim's lab has discovered specific molecular mechanisms in the brain that selectively support the formation of fear memories in females, who are 2-3 times more likely to suffer from PTSD than men. This could have important implications for the future development of therapeutic treatment options to treat PTSD, specifically in women. While the work on age-related memory loss and Alzheimer's disease is newer, Tim's research has already led to the development of the first pig model for Alzheimer's disease. As pigs are more similar to humans than almost any other animal and more readily available than prime mates, this new model could

accelerate drug discovery efforts for Alzheimer's disease, which is critical as current clinical trials have a near 100% failure rate despite the rapidly increasing diagnose of this major disease. To accomplish these research goals, Tim has established a highly accomplished and diverse research team. Tim's lab has consisted of 5 Ph.D. and 1 M.S. degree students coming from the graduate programs in Animal and Poultry Sciences, School of Neuroscience and the Translational Biology, Medicine and Health Programs. Further, at the undergraduate level Tim's lab has consisted of 30 students coming from the Neuroscience, Animal Sciences, Biochemistry and Biology programs. This demonstrates the highly interdisciplinary work being done in Tim's lab. Tim also works closely with other scientists from Virginia Tech and around the country, including Purdue University, Rosalind Franklin University of Medicine and Science, Penn State University, Marquette University, Stonybrook University, Northeastern University and the University of Wisconsin-Milwaukee. These collaborations have helped fuel Tim's significant success in securing extramural funding for his research, which currently exceed $6.2 million to his lab, and have led to the high number of publications from his lab, currently standing at 27 since 2018 with several more in peer review. Tim's discovery efforts can be broken down into several areas:

1. **Sex-specific molecular mechanisms of fear memory formation**
   Overview: Tim's lab has primarily focused on identifying the neurobiological basis of PTSD and why this disease is more common in women than men
   Main Findings: Tim's lab has identified the first sex-selective molecular mechanism controlling fear memory formation in the brain, which is important in only females. Additionally, other data from Tim's lab has provided a greater understanding of the underlying molecular mechanisms of PTSD in both sexes. The majority of Tim's 27 publications (since 2018) have been on this topic, showing the breadth of information provided by his research group.
   Clinical Applications: The discoveries from Tim's lab, to date, have important implications for the development of future therapeutic strategies to treat PTSD. Most notable is that Tim's lab has identified a specific molecular mechanism that may be a prime candidate to development therapeutic interventions against for treating PTSD in females.

2. **Molecular mechanisms of bystander PTSD**
   Overview: Tim's lab has recently taken a new approach to understand if PTSD that is acquired by *witnessing* a traumatic event is the same at the molecular level as directly experiencing the traumatic event – so called bystander PTSD, which has been rarely studied, to date.
   Main Findings: Tim's lab developed and validated a novel rodent model of indirectly acquired fear memories. Using this, his lab has now collected the first data showing that indirectly acquired fear memories have a distinct molecular signature from those that are directly acquired.
   Clinical Applications: These data have important implications for the development of novel therapeutic strategies to treat bystander PTSD, which has often been overlooked in the field and has limited information on what the most effective treatment strategies would be.

3. **Molecular mechanisms of age-related memory decline**
   Overview: Tim's lab has recently begun to examine the neurobiological basis of age-related memory loss, which is a risk factor for developing dementia and Alzheimer's disease
   Main Findings: While in its early stages, Tim's lab has begun to identify how specific molecular mechanisms become dysregulated across the lifespan and contribute to age-related memory loss and whether this varies by sex. For these studies, Tim's group is using a systematic approach that comes a specific molecular process across several different ages spanning the entire lifespan, which is often not used in studies trying to address this topic.

4. **Development of a pig model for accelerating drug discovery in Alzheimer's disease**
   Overview: While Alzheimer's disease research has been booming since the mid-2000s, to date, there remains a nearly 100% failure rate for new medications in clinical trials. This could be due to the simplicity of the rodent Alzheimer's disease model, which does not recapitulate all of the complex symptoms present in the human condition.

Main Findings: In collaboration with University of Missouri and Florida International University, Tim's lab has developed the first pig model of early-onset Alzheimer's disease.

Clinical Applications: The early validation from this model shows that it better recapitulates the symptoms of human Alzheimer's disease. Considering this and the incredible similarities in physiology, size and brain structure between humans and pigs, these studies have significant potential to rapidly advance drug discovery efforts in Alzheimer's disease research.

INTERGRATION OF KNOWLEDGE

As noted above, Tim's research is truly interdisciplinary as it spans psychology, biology, neuroscience, genetics, biochemistry and animal sciences. Most notable is that Tim successfully combined his background in neuroscience and genetics with his appointment in animal sciences via the development of the pig Alzheimer's disease model. This combination of multiple disciplines to address human health is a strong example of how Tim integrates knowledge from many disciplines to address his research questions. This is also evident in the many cutting-edge approaches his lab uses, which have successfully combined hardcore genetics and biochemistry to understand cognition and human disease. However, Tim also integrates his diverse, interdisciplinary expertise into his teaching. This is evident at the undergraduate level where he emphasizes the intersection of genetics, psychology and neuroscience in his NEUR 4314 class, as well as at the graduate level where he provides instruction on how to write grant proposals to federal and private agencies with significantly different mission, including the NIH (human health) and USDA (agriculture).

SERVICE

Tim has made significant contributions in service to his department, college, university and scientific community. As noted above, in addition to his direct mentoring of 1 M.S. and 5 Ph.D. students Tim serves or has served on the thesis or dissertation committee of 21 graduate students at Virginia Tech, including serving on the dissertation committee of 1 student at the University of Wisconsin-Milwaukee. He has served several support roles in his department, including actively being on the Graduate Curriculum Committee and the Tenure and Promotion Committee for the School of Animal Sciences. He has also served on several faculty search committees for the School of Animal, School of Neuroscience and joint search for the School of Neuroscience and Fralin Biomedical Research Institute (FRBI). At the college level, he served on the College of Agricultural and Life Sciences (CALS) Academic Program Policy Committee and was a member of the search committee for the CALS Associate Dean of Research. At the university level, since 2021 Tim has been the Co-Director for the Molecular and Cellular Biology (MCB) Graduate Program, which is an interdisciplinary Ph.D. "feeder" program that serves 7 departments across 4 colleges at Virginia Tech. Tim has also served since 2019 on Virginia Tech's IBC where he recently became the Vice Chair in 2023 and previously served on the IBC's subcommittee for COVID19 research that was formed during the pandemic to help expedite research on SARS-CoV-2 and potential treatments for the COVID19. Outside of Virginia Tech, Tim serves as ad hoc reviewer for more than 65 scientific journals, is Section Editor at *Brain Research Bulletin* and Associate Editor at *Frontiers in Behavioral Neuroscience*. He has also served on grant review panels for the NIH, National Science Foundation (NSF), Brain Canada, New Zealand, Denmark and Ireland and currently serves on panels/boards for important organizations in his area of research, including the Organization for the Study of Sex Differences.

SUMMARY

Dr. Timothy Jarome is a true rising star at Virginia Tech and within his field. To date, Tim's accomplishments, especially in research and student mentoring but also in service and teaching, have been exceptional. Considering his significant success as a researcher, effectiveness as a mentor and instructor and blossoming experience in leadership, Tim is well positioned to continue to make significant contributions at Virginia Tech and to his field and has an extraordinary upward career trajectory that is likely to continue in the years to come.

PERSONAL STATEMENT

I joined the faculty at Virginia Tech in January 2018 where I quickly established my lab examining the neurobiological mechanisms controlling the sex bias that exists in post-traumatic stress disorder (PTSD). Since then it has been a pleasure working at Virginia Tech and my experiences over this time have been nothing short of incredible. I was hired with a 70% research and 30% teaching appointment, with service considered a subsection under the teaching category. Thus, I was primarily expected to establish a highly competitive and visible research program that could attract extramural funding while also contributing to the teaching and service missions of the university. Admittedly, while I had high hopes for my first faculty position and knew the university would give me the resources I needed to succeed, my time at Virginia Tech has far exceeded even my most unrealistic expectations. Virginia Tech not only provided me an opportunity to succeed, but rather they gave me an environment to **_thrive_** in. Importantly, this extends beyond my research program as I have had numerous opportunities to engage with our fantastic student body and gain an incredible amount of leadership experience for this early stage of my career. Virginia Tech's motto is *Ut Prosim*, or "That I May Serve." With this in mind, I have developed my teaching, service and research programs to better serve the students, the university and my field.

Discovery: When I joined the School of Animal Sciences in 2018, the department hired me, a neuroscientist by training, to establish a highly visible, competitive research program aimed at studying biologically-relevant traits in animal models as a way to better understand and treat human disease. Additionally, being an agricultural department in a college that includes life sciences, the department hired me with the hope that I might be able to establish a research program that would include large animal models to better understand and treat human disease. In this regard, I had a multi-step vision for my research program that consisted of 1) establish my research focus on understanding the molecular mechanisms of fear memory formation, and then 2) start to create and validate large animal models of human disease with an emphasis on neurodegenerative and neurodevelopmental disorders. Both of these goals required that I form interdisciplinary research teams that had complimentary expertise to myself. Virginia Tech provided a perfect environment to establish these collaborations, which has undoubtedly allowed my research program to reach the level of success it has today. However, the most significant reason for why my research discovery program has been as successful as it has is due to our ability to adapt and let the data control the direction we go – this adaptability is something I stress to my students/trainees as part of my mentorship approach. Further, one of the missions of my college is to develop new technology and disseminate this information to the scientific community and public in general. Notable here is that my lab has developed several new approaches/technologies for my field, which has changed the way we study the molecular mechanisms of fear memory formation. Thus, my lab has taken advantage of the excellent environment present here at Virginia Tech to create new technologies and begin to answer important questions that have implications for the treatment of major psychiatric and neurodegenerative disorders that impact the Commonwealth and rest of the country.

Teaching: Outside of my research, my time as an instructor and mentor may be the most rewarding part of my job. As an instructor, I have worked hard to make even the most difficult topics accessible to all, regardless of their prior academic background. While I have been successful in my academic training and career, I did this after coming from a primary school system that had been struggling for decades. Furthermore, I am a first-generation college student. This latter point was especially important because I did not realize until I was faculty how many individuals with advanced degrees came from families who had Ph.D. or M.D. degrees. Due to this, I have strived to make science something that is attainable for everyone, regardless of the background they come from. This also is reflected in my time as a mentor to undergraduate and graduate students in the lab, with the former being important to get students excited about doing research and the latter it is important on nurturing that excitement and helping graduate students

advance to the next stage of their career. The undergraduate students who have worked in the lab under my guidance have moved on to M.D., Ph.D. and combined M.D./Ph.D. programs at some of the most prestigious universities in the country, while the graduate students are now working as faculty, doing postdoctoral training or working in industry. Thus, my mentorship strategy has helped these students achieve the next stage of their academic training or career, which has been more rewarding to me than all of our research accomplishments. I have been very satisfied with my success as an instructor and mentor but I continue to adjust my teaching and mentoring strategies to best serve the next generation of students.

Knowledge Integration: During my time at Virginia Tech I have built a lab that performs interdisciplinary research aimed at improving human health. In fact, I was hired at Virginia Tech under the Adaptive Brain and Behavior Destination Area, which was an interdisciplinary area of emphasis for expanded research development by the Provost in 2018. When I came to Virginia Tech my research program already successfully combined the disciplines of psychology, biology, neuroscience and genetics. However, during my time here I have been able to further extend this to include biochemistry and animal sciences. Thus, my lab is truly interdisciplinary in our approach and scope. Additionally, my teaching is interdisciplinary at both the undergraduate and graduate level, which has allowed my courses to reach a broader audience/range of students at Virginia Tech. Further, in serving as the Co-Director for the Molecular and Cellular Biology (MCB) graduate program I have had the opportunity to reach an even broader population of graduate students that span disciplines of neuroscience, biology, animal sciences, entomology, veterinary medicine, virology, human nutrition and biochemistry. Serving on MCB has actually led to the beginning of collaborative efforts from my lab in topic areas that we never would have considered researching before, including virology. As a result, knowledge integration – interdisciplinary work – is reflected in my research program, teaching and mentoring program and my university service.

Service: Despite that my position does not have a dedicated section to service, it has been and remains an important area of emphasis for me during my time at Virginia Tech. Part of my interest in service has been to help advance the training of our graduate students, which is why I agreed to come on as the Co-Director of the MCB program only 3 years after starting my position, despite the significant amount of time that must be invested in such a position. Additionally, I have always had an interest in helping advance the broader research and academic missions of the university, which is why I have served on the Institutional Biosafety Committee (IBC) since 2019 and for 2 years on the College of Agricultural and Life Sciences Academic Program Policy Committee. Further, while I am still early in my scientific career, having recently successfully navigated the tenure and promotion process has given me unique perspectives that I want to share with younger faculty as they go through the same process. In this way I can help guide junior faculty to successfully establish their research and teaching programs, which I have done formally on my department's tenure and promotion committee but more often informally by working with junior faculty at Virginia Tech and other institutions who have recently begun their first faculty position. I also have strived to give back to my field, which I have done via peer review for a large number of scientific journals and serving on numerous grant review panels. Thus, though my service is not a dedicated area under my position appointment, I have made it a priority during my first 5.5 years at Virginia Tech and feel that I am quite successful in this area, to date.

In summary, my time at Virginia Tech has been fantastic. I have had the opportunity to establish an internationally recognized research program aimed understanding the sex-specific molecular mechanisms of fear memory formation, teach and mentor amazing students and work with exceptional colleagues. I am indebted to the students and staff that have worked in my lab and those students who have made teaching one of the most enjoyable experiences of my job. I am excited to continue my growth as a faculty member and continue to build my interdisciplinary research program, further my effectiveness as an instructor and mentor and further serve the university, my field and community.

EDUCATION
University of Wisconsin-Milwaukee, Milwaukee, WI   M.S. 2010, Ph.D. 2013
4.0 GPA/ NIH Graduate Research Fellowship/ 2013 American Psychological Foundation Award

Kent State University, Kent, OH   B.S. 2006
3.89 GPA/ Graduated *summa cum laude*

CURRENT POSITION
Associate Professor: Virginia Tech, School of Animal Sciences   2022-present
- ▪ **Research:** Director – Neuroepigenetics Laboratory
  - o Research mentor to 5 PhD, 1 MS and > 30 undergraduate students, while also serving on an additional 21 graduate student thesis committees. Received 8 federal (NIH) and 1 private (Virginia CHRB) grant as Principal Investigator (PI), 2 federal (NIH, DoD) as Co-Investigator, as well as 2 NIH Diversity Supplement grants (NIH) to support diversity, equity and inclusion in biomedical research
- ▪ **Teaching:** Genetics in Neuroscience (NEUR 4314), Advanced Genetics in Neuroscience (NEUR 5314G), Writing Fellowship Grant Applications (APSC 5604)

RESEARCH AND ACADEMIC HONORS (selected)
- ▪ Excellence in Research Award, School of Neuroscience (VT)   2020
- ▪ Adaptive Brain and Behavior Career Award (VT)   2018
- ▪ Postdoctoral Scholars Award (UAB)   2017
- ▪ American Federation for Aging Research Postdoctoral Fellowship   2016
- ▪ Psychology Graduate Research Award   2013
- ▪ American Psychological Foundation Ruth G. and Joseph D. Mattarazzo Research Award   2012
- ▪ NIH Predoctoral Fellowship   2010-2013

APPOINTMENTS AND DIVERSITY INITIATIVES (selected)
- ▪ Faculty Mentor: NIH Diversity Supplement for Graduate Studies   2022-present
- ▪ Faculty Mentor: NIH Diversity Supplement for Graduate Studies   2021-2023
- ▪ Assistant Professor, VT School of Animal Sciences   2018-2022
- ▪ Core Faculty, VT School of Neuroscience   2018-present
- ▪ Faculty of Health Sciences (VT)   2018-present
- ▪ Faculty Mentor: VT PREP   2019-present
- ▪ Faculty Mentor: VT George Washington Carver Program   2018-2023

OUTREACH AND PROFESSIONAL SERVICES (selected)
- ▪ Member: Organization for the Study of Sex Differences Awards Committee   2023
- ▪ Section Editor: *Brain Research Bulletin*, Aging Neuroscience   2023-present
- ▪ Associate Editor: *Frontiers in Behavioral Neuroscience*   2020-present
- ▪ Ad hoc Reviewer: For 65+ scientific journals
- ▪ Grant Reviewer: National Institute of Health (NIH), National Science Foundation (NSF), Brain Canada, Marsden Fund (New Zealand), Denmark Independent Research Fund

UNIVERSITY SERVICE (selected)
- ▪ Vice Chair: VT Institutional Biosafety Committee (IBC)   2023-present
- ▪ Member: VT Search Committee for CALS Associate Dean   2022-2023
- ▪ Member: VT School of Animal Sciences Tenure & Promotion Committee   2022-present
- ▪ Co-Director: Molecular and Cellular Biology Graduate Program   2021-present
- ▪ Member: VT Institutional Biosafety Committee (IBC)   2019-2023

- Member: Faculty Search Committees for School of Animal Sciences, School of Neuroscience

GRANT FUNDING (selected from > $5.8M as PI and > $6.2M total)

1. **NIA (R21),** 09/30/2023-09/29/2025. "Alleviating age-related memory impairment through proteasome stimulation" $429,409.00. PI
2. **NIMH (R21),** 12/01/2022-11/30/2024. "Behavioral, molecular and sex-specific mechanisms of indirectly learned fear memory" $432,812.00. PI
3. **NIA (R21),** 09/15/2022-05/31/2024. "IGF2 regulation of microglia function during aging" $432,781.00. PI
4. **NIA (R21),** 08/01/2022-07/30/2024. "Validating pig models of Alzheimer's disease" $446,615.00. PI
5. **Virginia CHRB,** 07/01/2022-06/30/2024. "The role of DNA 5-hydroxymethylation in the development of obesity." $266,000.00. PI
6. **NIMH (R01),** 12/01/2020-10/31/2025. "Investigating sex differences in nuclear protein degradation during fear memory formation" $1,962,473.00. PI
7. **NIMH (R21),** 07/20/2020-07/19/2023. "Genome-wide analysis of sex differences in cortical DNA hydroxymethylation during fear memory formation" $425,762.00. PI
8. **NIMH (R21),** 05/05/2020-05/04/2023. "Exploring epigenetic regulation of memory extinction" $419,122.00. PI
9. **NIMH (R21),** 02/01/2020-12/31/2022. "The role of linear ubiquitination in memory formation" $421,877.00. PI

SELECTED RECENT PUBLICATIONS (54 total; 2562 citations; *h*-index 28; i10-index 40)

1. Farrell, et al. (2023). "Lysine 63 polyubiquitination selectively regulates ATP synthesis and proteasome activity during fear memory formation in the female amygdala." *Molecular Psychiatry.*
2. Gustin, et al. (2022). "Protein SUMOylation is a sex-specific regulator of fear memory formation in the amygdala." *Behavioural Brain Research.*
3. Farrell, et al. (2021). "Proteomic analysis reveals sex-specific protein degradation targets in the amygdala during fear memory formation." *Frontiers in Molecular Neuroscience.*
4. Martin, et al. (2021). "Females, but not males, require protein degradation in the hippocampus for context fear memory formation." *Learning and Memory.*
5. Musaus, et al. (2021). "Sex-specific linear polyubiquitination is a critical regulator of contextual fear memory formation." *Frontiers in Behavioral Neuroscience.*
6. Jarome, et al. (2021). "Ubiquitination of histone H2B by proteasomal RPT6 controls histone methylation chromatin dynamics during memory formation." *Biological Psychiatry.*
7. Devulapalli, et al. (2021). "Males and females differ in the engagement and regulation of, but not requirement for, protein degradation in the amygdala during fear memory formation." *Neurobiology of Learning and Memory.*

Complete List: https://scholar.google.com/citations?hl=en&user=DtCavBIAAAAJ

IN THE MEDIA

- Interviewed (recorded) by WVTF Roanoke regarding new grant on PTSD. June 2023
- Interviewed (live) by WDBJ Roanoke News regarding new paper on PTSD. June 2023
- Interviewed (live) by Fox 5 DC News regarding new paper on PTSD. May 2023
- Interviewed (recorded) by WVTF Roanoke regarding new grant on PTSD. March 2023
- Interviewed (live) by Fox 5 DC News regarding new grant on PTSD. March 2023
- Interviewed by *Epsillon* regarding paper on DNA breaks and memory. April 2022
- Interviewed by *Quanta Magazine* regarding new paper on DNA breaks and memory. August 2021

STATEMENTS OF SUPPORT

I'm pleased to support the nomination of Dr. Timothy Jarome for the *2024 SCHEV Rising Star Award.* Dr. Jarome's achievements in teaching and research highlight his exceptional contributions to academia. In the classroom, Dr. Jarome's innovative teaching methods distill complex neuroscience concepts into engaging and accessible lessons, fostering a deep passion for the subject. He is dedicated to mentoring and supporting students through their academic journeys. Dr. Jarome's research in the field of neuroscience has garnered significant attention. His groundbreaking investigations into the neural mechanisms of memory and learning have advanced our understanding of cognitive processes and placed Virginia Tech at the forefront of this vital area of inquiry. Dr. Jarome's commitment to teaching excellence and cutting-edge research makes him an outstanding candidate for the Rising Star Award. His contributions to Virginia Tech and the broader academic community will shine even brighter in the years ahead, making him a deserving recipient of this honor. *Dr. Tim Sands, President, Virginia Tech* **(Supervisor).**

Dr. Jarome is a distinguished teacher, researcher, and scientist whose work in the cellular and molecular mechanisms of memory formation and storage is driving discovery of how aversive experiences drive epigenetic changes in neurons, which in turn control future behavioral and physiological responses. His innovative research is leading and advancing the transdisciplinary investigation of mechanisms of initial memory storage and modification following retrieval (recall), the latter of which has significant potential for the treatment of anxiety disorders such as post-traumatic stress disorder (PTSD). I am pleased to support and advocate for his nomination for the *SCHEV Rising Star Award* and the numerous collaborative projects at Virginia Tech and around the country he is contributing to that examine neurobiological mechanisms in normal and abnormal memory formation, aging and disease. *Dr. Cyril Clarke, Executive Vice President and Provost, Virginia Tech* **(Supervisor).**

In the short time that Dr. Timothy Jarome has been a faculty member at Virginia Tech, he has established a highly productive, scholarly, and impactful program in biomedical research, teaching, and mentorship. His success in garnering numerous federal grants to support interdisciplinary research has led to significant discoveries and scholarly contributions to address PTSD and anxiety disorders, Alzheimer's disease, and memory loss disorders. Similarly, his commitment to highly effective teaching and mentoring of students and the integration of his research, teaching, and service are equally as impressive. Current and former students have excelled under his leadership and have significant records of accomplishment. Dr. Jarome is clearly advancing Virginia Tech's reputation as a global land grant university. As a rising star, he exemplifies the highest standards of teaching, scholarship, and service. *Dr. Alan L. Grant, Dean of the College of Agriculture and Life Sciences, Virginia Tech* **(Supervisor).**

It is hard to imagine a faculty member who better exemplifies the descriptor of "rising star" more than Dr. Jarome. He has established himself as a productive scholar, passionate educator and mentor, and valued colleague and collaborator... Over the past several years, he has developed a stellar reputation in the field for his ability to generate innovative tools to manipulate gene expression in the mammalian hippocampus and to apply these tools to target the ubiquitin-proteasome and epigenetic pathways. These are pathways that have long been hypothesized to contribute to learning and memory but have proved difficult to manipulate and test. For this reason, Dr. Jarome is not only establishing his reputation in this field but **he is pioneering this field**. He has already published 56 manuscripts and has secured over $6 million in extramural support since launching his own laboratory. In addition to his scholarship, Dr. Jarome has mentored numerous undergraduate and graduate students, many of which have already published their first manuscripts and many have received prestigious awards and recognition for the research accomplishments – all of which demonstrates how committed and skillful Dr. Jarome

is at training the next generation of scientists. These are just some of the reasons why Dr. Jarome is a rising star and how he continues to elevate neuroscience research and training at Virginia Tech. ***Dr. Michael Fox, Dean for College of Natural Sciences, University of Massachusetts Amherst (Former Supervisor).***

Dr. Jarome has worked tirelessly to establish a highly visible, internationally respected interdisciplinary research program that has attracted over $6 million in support, primarily from federal agencies. He has published over 25 papers since starting at Virginia Tech, many in leading scientific journals, and all with student authors. He is highly involved in the teaching missions of multiple departments, speaking to the interdisciplinary nature of his work, and has been an excellent mentor to graduate and undergraduate students in the lab. Dr. Jarome is also one of the most active faculty members in service to the department, college, university and his field. At this stage of his career it is hard to a more productive and accomplished faculty member than Dr. Jarome. He is truly a rising star at Virginia Tech and is incredibly deserving of this award. ***Dr. David Gerrard, Department Head, School of Animal Sciences, Virginia Tech (Supervisor).***

Dr. Tim Jarome has had extraordinary success in establishing himself as an independent investigator. At Virginia Tech, he has taken advantage of his training to establish an independent program of research that uses novel and innovative cutting-edge technologies and is exceptionally well funded by the NIH. His publication record is outstanding in terms of both quality and quantity. He has published with a plethora of graduate and undergraduate students, and most recently with a high school student, and his students have won numerous awards from Virginia Tech, scientific societies, and the NIH. I have evaluated countless numbers of colleagues through (NIH grant) study section, faculty hiring, and tenure and promotion reviews, and I am not aware of any other PI at his stage who has been so extraordinarily successful in securing NIH funds. ***Dr. Karyn Frick, Distinguished Professor, University of Wisconsin-Milwaukee (Colleague).***

As an active collaborator, I am excited to recommend Dr. Timothy Jarome for the prestigious SCHEV Rising Star Award. Dr. Jarome has made seminal contributions in the field of protein ubiquitination (also referred to as protein degradation) and has expanded our understanding as to how protein degradation machinery diverges between males and females in the brain underlying memory processing. This is of high translational relevance for a variety of diseases ranging from post-traumatic stress disorder to age-related dementia and neurodegenerative conditions. He has received several NIH grants to delve deeper into this exciting and novel research domain that is currently sparsely understood. Apart from being a scientist of the highest caliber, Dr. Jarome is a model mentor to his trainees and junior investigators like me. He is always available for scientific conversations and guidance and is willing to go that extra mile to uplift other fellow scientists along with him. Dr. Jarome, therefore, imbibes a perfect balance of compassion and astute scientific acumen that makes him worthy of this honor. ***Dr. Swarup Mitra, Assistant Professor, Oklahoma State University (Colleague).***

Over the 5 years I studied under Dr. Jarome he was and continues to be an incredible advisor. Dr. Jarome's breath of knowledge made him an invaluable guide towards my dissertation research success. When I first joined the lab, I had very little confidence in my scientific abilities, and I had crippling writing anxiety. But through Dr. Jarome's mentorship I fine-tuned my oral presentation skills, and successfully earned 5 first- author publications. Dr. Jarome has always encouraged his students to pursue their passions and hobbies, including supporting each student's career aspirations, extracurricular activities, and campus involvement. Through his devotion to student success, I have developed a roaring confidence in my abilities as a young scholar and scientist. As a result of his impact on my life I have followed in his footsteps and rejoined academia as a professor. ***Dr. Taylor McFadden, Assistant Professor, Trinity Washington University (Former Graduate Student).***