

# DIANA TAVARES FERREIRA

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## EDUCATION

OCTOBER 2013 – JANUARY 2018

**PHD IN NEUROSCIENCE**, UNIVERSITY OF SHEFFIELD, UK

Mentor: Prof. Fiona Boissonade

SEPTEMBER 2008 – SEPTEMBER 2013

**PHARMD/MASTER'S DEGREE IN PHARMACEUTICAL SCIENCES**, UNIVERSITY OF COIMBRA, PORTUGAL

## EXPERIENCE

START JANUARY 2024

**ASSISTANT PROFESSOR OF NEUROSCIENCE**, UNIVERSITY OF TEXAS AT DALLAS, USA

PI Data Core UTD PRECISION Pain Center (U19)

JANUARY 2018 – DECEMBER 2023

**POSTDOCTORAL RESEARCH ASSOCIATE & RESEARCH SCIENTIST II**, UNIVERSITY OF TEXAS AT DALLAS, USA

Mentor: Dr. Ted Price

## RESEARCH SUPPORT

### • ONGOING RESEARCH SUPPORT

U19 NS130608-02

Tavares-Ferreira **Project Lead/Data Core PI**

09/2022 – 09/2027

Human Nociceptor and Spinal Cord Molecular Signature Center.

The goal of this project is to create the scientific foundation that will empower pain researchers around the world to approach the problem of treating pain in a new way, deeply rooted in a fundamental understanding of the first neurons and first synapses in the human pain pathway. My role will be to characterize human spinal cord and DRG from a computational approach.

### • COMPLETED RESEARCH SUPPORT

**Role:** Visiting scientist at Eli Lilly Research UK.

**Time Period:** October 2016 – March 2017

**Granting Agency:** Higher Education Funding Council for England (HEFCE) catalyst studentship

**Title:** Application of bioinformatics tools to analyze microRNA expression and its targets following lingual nerve injury.

**Role:** Research trainee at the School of Pharmacy UCL, UK

**Time Period:** June – September 2013

**Granting Agency:** European Region Action Scheme for the Mobility of University Students (ERASMUS) studentship

**Title:** Naphthalene Diimide G-quadruplex ligands as telomere targeting agents.

**Role:** Research trainee at the Medical University of Warsaw, Poland

**Time Period:** July – August 2012

**Granting Agency:** International Pharmaceutical Students Federation (Student Exchange Program)

**Title:** Immunophenotyping analysis of antigen-presenting cells in viral diseases (short study).

## SCIENCE DISSEMINATION

### • PEER REVIEWED ARTICLES

1. Wong C, Tavares-Ferreira D, ... Khoutorsky A. 4E-BP1-dependent translation in nociceptors controls mechanical hypersensitivity via TRIM32/type I interferon signaling. *Science Advances*. In Press.
2. Shen BQ, Sankaranarayanan I, Price TJ, **Tavares-Ferreira D\***. Sex-differences in prostaglandin signaling: a semi-systematic review and characterization of PTGDS expression in human sensory neurons. *Scientific Reports*. 2023. [**\*senior and co-corresponding author**]
3. Sankaranarayanan, I, **Tavares-Ferreira, D**, ... Price, TJ. Inducible co-stimulatory molecule (ICOS) alleviates Paclitaxel induced peripheral neuropathy via an IL-10-mediated mechanism in female mice. *Journal of Neuroinflammation*. 2023
4. Garrity, R., Arora, N., Haque, M.A., Weis, D., Trinh, R.T., Neerukonda, S.V., Kumari, S., Cortez, I., Ubogu, E.E., Mahalingam, R., **Tavares-Ferreira, D.**, et al. Fibroblast-derived PI16 sustains inflammatory pain via regulation of CD206+ myeloid cells. *Brain, Behavior, and Immunity*. 2023.
5. Mitchell, M. E., Cook, L. C., Shiers, S., **Tavares-Ferreira, D.**, Akopian, A. N., Dussor, G., & Price, T. J. Characterization of Fragile X Mental Retardation Protein expression in human nociceptors and their axonal projections to the spinal dorsal horn. *Journal of Comparative Neurology*. 2023.
6. Vroman R, Hunter RS, Wood MJ, Davis OC, Malfait Z, George DS, Ren D, **Tavares-Ferreira D**, Price TJ, Miller RJ, Malfait AM. Analysis of matrisome expression patterns in murine and human dorsal root ganglia. *Frontiers in Molecular Neuroscience*. 2023.
7. Sankaranarayanan I, **Tavares-Ferreira D**, He L, Kume M, Mwirigi J, Madsen TM, Petersen KA, Munro G, Price TJ. Meteorin alleviates Paclitaxel-induced peripheral neuropathic pain in mice. *The Journal of Pain*. 2022.
8. Ray PR, Shiers S, Caruso . P., **Tavares-Ferreira D**, Sankaranarayanan I, Uhelski ML, ... & Price TJ. RNA profiling of human dorsal root ganglia reveals sex-differences in mechanisms promoting neuropathic pain. *Brain*. 2022.
9. **Tavares-Ferreira D\***, Shiers S, Ray Pradipta R, Wangzhou A, Jeevakumar V, Sankaranarayanan I, Cervantes Anna M, Reese Jeffrey C, Chamesian A, Copits Bryan A, Dougherty Patrick M, Gereau Robert W, Burton Michael D, Dussor G, Price Theodore J. Spatial transcriptomics of dorsal root ganglia identifies molecular signatures of human nociceptors. *Science Translational Medicine*. 2022. [**\*co-corresponding author**]
10. **Tavares-Ferreira D**, Ray PR, Sankaranarayanan I, Mejia GL, Wangzhou A, Shiers S, Uttarkar R, Megat S, Barragan-Iglesias P, Dussor G, Price Theodore J. Sex differences in nociceptor transcriptomes contribute to divergent prostaglandin signaling in male and female mice. *Biological Psychiatry*. 2022.
11. Ray Pradipta R, Wangzhou A, Ghneim N, Yousuf MS, Paige C, **Tavares-Ferreira D**, Mwirigi JM, Shiers S, Sankaranarayanan I, McFarland AJ, ... Price Theodore J. A pharmacological interactome between COVID- 19 patient samples and human sensory neurons reveals potential drivers of neurogenic pulmonary dysfunction. *Brain, behavior, and immunity*. 2020.
12. Franco-Enzástiga Ú, García G, Murbartián J, González-Barrios R, Salinas-Abarca AB, Sánchez-Hernández B, **Tavares-Ferreira D**, Herrera LA, Barragán-Iglesias P, Delgado-Lezama R, Price Theodore J, Granados- Soto, V. Sex-dependent pronociceptive role of spinal  $\alpha 5$ -GABAA receptor and its epigenetic regulation in neuropathic rodents. *Journal of neurochemistry*. 2021.
13. Baptista-de-Souza D, **Tavares-Ferreira D**, Megat S, Sankaranarayanan I, Shiers S, Flores CM, Ghosh S, Nunes-de-Souza RL, Canto-de-Souza A, Price Theodore J. Sex differences in the role of atypical PKC within the basolateral nucleus of the amygdala in a mouse hyperalgesic priming model. *Neurobiology of Pain*. 2020.
14. Megat S, Ray Pradipta R, **Tavares-Ferreira D**, Moy JK, Sankaranarayanan I, Wangzhou A, Lou TF, Barragan-Iglesias P, Campbell ZT, Dussor G, Price Theodore J. Differences between dorsal root and trigeminal ganglion nociceptors in mice revealed by translational profiling. *Journal of Neuroscience*. 2019.
15. Ray Pradipta R, Khan J, Wangzhou A, **Tavares-Ferreira D**, Akopian AN, Dussor G, Price Theodore J. Transcriptome analysis of the human tibial nerve identifies sexually dimorphic expression of genes involved in pain, inflammation, and neuro-immunity. *Frontiers in molecular neuroscience*. 2019.

16. **Tavares-Ferreira D**, Lawless N, Bird EV, Atkins S, Collier D, Sher E, Malki K, Lambert DW, Boissonade FM. Correlation of miRNA expression with intensity of neuropathic pain in man. **Molecular pain**. 2019.

## • BOOK CHAPTERS

1. **Tavares-Ferreira D\***, Megat S, Price TJ. Using Translating Ribosome Affinity Purification (TRAP) to Understand Cell-Specific Translatomes in Pain States. *In*: Seal RP, editor. Contemporary Approaches to the Study of Pain: From Molecules to Neural Networks. New York, NY: **Springer US**; 2022. [*\*co- corresponding author*]

## • PREPRINTS (not yet peer-reviewed)

1. Bhuiyan S, et al. Harmonized cross-species cell atlases of trigeminal and dorsal root ganglia. *bioRxiv*. 2023.
2. Zeidler, M., **Tavares-Ferreira, D.**, Brougher, J., Price, T.J. and Kress, M. NOCICEPTRA2. 0-a comprehensive ncRNA atlas of human native and iPSC-derived sensory neurons. *bioRxiv*. 2023.
3. Kalia A K, Kelly A, **Tavares-Ferreira D**, ... Lampert A. Hyperexcitability of stem cell-derived sensory neurons of erythromelalgia patient normalized by divalent ions. *In review*

## • CONFERENCES AND SCIENTIFIC MEETINGS

### 1. Oral presentations

- "Spatial Analysis of Human Dorsal Root Ganglia and peripheral nerves", Challenge of Chronic Pain, Cambridge, November 2023.
- "Deciphering the molecular landscape of human peripheral nerves: implications for peripheral neuropathies", UTD-UTSW Pain Symposium, UTSW, October 2023.
- Regional Rare Neuroimmune Disorders Symposium, October 2023.
- "Spatial Analysis of Human Dorsal Root Ganglia Reveals Transcriptomic Changes Associated with Diabetic Peripheral Neuropathy", Peripheral Nerve Society, Copenhagen, June 2023.
- "Unlocking peripheral neuropathy mechanisms and drug discovery with transcriptomics", Department of Neuroscience, University of Texas at Dallas, January 2023.
- "Molecular Characteristics of the First Synapses in the Human Pain Pathway", Molecular and Cellular Neurobiology Gordon Research Conference, Ventura, July 2022.
- "The Human Dorsal Root Ganglion at Near Single-Neuron Resolution", Neurotrauma, Atlanta, June 2022.
- "Peripheral neuropathies: the role of mRNA transport and local translation in human peripheral nerves", USASP, Cincinnati, May 2022.
- "Interactions Between Human Peripheral Sensory Neurons And Immune Cells", PNS, Miami, May 2022.
- "Molecular Characterization of the Human DRG and its Implication for Pain Therapeutic Development", GEN/10x webinar, April 2022.
- "The human dorsal root ganglion at near single-neuron resolution", Mapping Neuronal Gene Expression to Understand Pain, The Scientist Webinars August 2021.
- "Using spatial transcriptomics to characterize neuronal subtypes in human DRG". Pain2021 workshop, Gulf Coast Consortium for Translational Pain Research.
- "Sex differences in nociceptor translatomes contribute to divergent prostaglandin signaling in male and female mice" Post-transcriptional Control Mechanisms in Pain, Inaugural USASP Scientific Meeting 2020.
- "Understanding the neurobiology of pain: Identification of miRNAs induced following lingual nerve injury", The CENTRE for COLLABORATIVE NEUROSCIENCE 2017 meeting, Eli Lilly UK.
- "Resolvin receptors and miRNAs in neuropathic pain", Internal seminar series 2016, School of Clinical Dentistry, Sheffield, UK.

## 2. Poster presentations

- “Mechanisms of axonal integrity and implications for peripheral neuropathies”, Society for Neuroscience conference 2022, San Diego, USA.
- “Steps toward the Elucidation of the Axonal Transcriptome of Human Peripheral Nerves”, USASP 2022, Cincinnati, USA.
- “Interactions Between Human Peripheral Sensory Neurons And Immune Cells”, PNS 2022, Miami, USA.
- “Differentially Translated mRNAs in Male and Female DRG Nociceptors”, Society for Neuroscience conference 2019, Chicago, USA.
- “Analyses of human tibial nerve transcriptomes reveal sex-specific gene expression in chronic joint pain and diabetes type 2”, IASP 2018, Boston, USA.
- “Expression of resolvin receptor ChemR23 in an animal model of neuropathic pain”, IASP 2016, Yokohama, Japan.
- “Resolvin receptors: opportunity for new drug targets for neuropathic pain”, NeuPSIG 2015 Nice, France.

## HONORS

- Peter J. Dyck Abstract Prize Winner for Diabetic Neuropathy research at PNS meeting in Miami (2022).
- Recipient of Higher Education Funding Council for England (HEFCE) Catalyst Studentship to develop collaborative project (6 months) with Eli Lilly Research UK (2016).
- Biotechnology YES competition, Young Entrepreneurs Scheme UK (participant, 2015).
- Prize for best poster presentation, Postgraduate Research Day, University of Sheffield (2015).
- Award for the 3% Best students at the University of Coimbra, Portugal (2013).

## TEACHING

2015: Group Facilitator for The Health Challenge Module, Faculty of Medicine, Dentistry and Health, University of Sheffield, UK.

2023: Guest lecture for Neuroscience of Pain class, University of Texas at Dallas, USA.

## PEER REVIEW

- Reviewed manuscripts for *Frontiers in Immunology* (2022), *Journal of Proteome Research* (2021), *PAIN* (The official journal of the International Association for the study of Pain – IASP, 2020), *European Journal of Pain* (2018), *PLOS ONE* (2023).

## MENTORSHIP

2023	Khadijah Mazhar, First year committee member, University of Texas at Dallas
2023 –	Nikhil Inturi, Master’s student working on U19 Data Core, University of Texas at Dallas
2019 –	Miriam Kotamarti, Undergraduate student (pre-med) in Price Lab, University of Texas at Dallas
2019 – 2023	Breanna Shen, Undergraduate student (pre-med) in Price Lab, University of Texas at Dallas
2020 – 2022	Sanjay Neerukonda, Undergraduate student (pre-med) in Price Lab, University of Texas at Dallas
2020 – 2022	Anna Crain, Master’s student (pre-med) in Price Lab, University of Texas at Dallas
2018 – 2021	Ruta Uttarkar, Undergraduate student (pre-med) in Price Lab, University of Texas at Dallas
2018	Lulu Eisenberg, High-school student in Price Lab, University of Texas at Dallas

## ACADEMIC SERVICE

MAY 2022 – JUNE 2023

**SCIENTIFIC PROGRAM COMMITTEE MEMBER**, PERIPHERAL NERVE SOCIETY (PNS), USA

- Term: May 2022 – June 2023.
- Organization of PNS Annual Meeting, including abstract selection.
- Co-chair for the session Basic Science Highlights.

MAY 2021 - PRESENT

**STEERING COMMITTEE MEMBER**, GULF COAST CONSORTIUM FOR TRANSLATIONAL PAIN RESEARCH, USA

- Organizing surveys on trainee needs and developing workshops according to the needs.

JANUARY 2015 – OCTOBER 2017

**COMMITTEE MEMBER**, DENTAL SCHOOL RESEARCH SOCIETY, UNIVERSITY OF SHEFFIELD, UK

- Neuroscience graduate student representative.
- Organized events for graduate students.

## OTHER PROFESSIONAL EXPERIENCE

OCTOBER 2016 – MARCH 2017

**VISITING SCIENTIST**, ELI LILLY RESEARCH, UK

- Received training from the Neuroscience Genetics team at Eli Lilly UK in bioinformatics to analyze miRNA expression datasets.
- Used R/Bioconductor packages to identify differentially expressed miRNAs and studied the networks and pathways of predicted target genes relevant to pain processing.
- Funded through Higher Education Funding Council for England (HEFCE) catalyst studentship (UK).

JUNE 2013 – SEPTEMBER 2013

**RESEARCH TRAINEE**, SCHOOL OF PHARMACY, UNIVERSITY COLLEGE LONDON, UK

- Worked on a project on Naphthalene Diimide G-quadruplex ligands as telomere targeting agents.
- Funded by the European Region Action Scheme for the Mobility of University Students (ERASMUS) studentship (2013).

JULY 2012 – AUGUST 2012

**RESEARCH TRAINEE**, MEDICAL UNIVERSITY OF WARSAW, POLAND

- Worked on the immunophenotyping analysis of antigen-presenting cells involved in viral diseases using immunoassays.
- Student Exchange Program from the International Pharmaceutical Students Federation.