OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 01/31/2026)

BIOGRAPHICAL SKETCH

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NAME: Pessoa, Marco T.

eRA COMMONS USER NAME (credential, e.g., agency login): MARCOPESSOA

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Start Date  MM/YYYY | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- | --- |
| UFSJ – Divinopolis, MG, Brazil | BS | 04/2008 | 02/2012 | Biochemistry |
| UFSJ – Divinopolis, MG, Brazil | MS | 03/2012 | 03/2014 | Biochemistry and Molecular Biology |
| UFSJ – Divinopolis, MG, Brazil | PhD | 03/2015 | 03/2019 | Biochemistry and Molecular Biology |
| KUMC – Kansas City, KS, US | Internship Training | 07/2017 | 06/2018 | Biochemistry and Molecular Biology |
| UNIFAL – Alfenas, MG, Brazil | Postdoctoral Fellow | 08/2019 | 01/2020 | Physiology and Pharmacology |
| Marshall University – Huntington, WV, US | Postdoctoral Fellow | 02/2020 | 07/2025 | Cardiovascular Physiology |

**A. Personal Statement**

My research interests involve the study of the Na/K-ATPase-mediated cell signaling pathways triggered by different cardiotonic steroids and how those events affect human diseases. My research experience and academic background have provided me with a solid knowledge in biochemistry, cell biology and cardiac physiology.

*Ongoing projects:*

* **Transformational Project Award (TPA) – American Heart Association (AHA) - 25TPA1477521**

**Role: Collaborating Investigator**

**Sandrine Pierre (PI)**

**07/01/2025 – 06/30/2028**

**Biased Signaling at the Cardiac Na/K-ATPase Receptor: A New Approach in Uremic Cardiomyopathy**

**B. Positions, Scientific Appointments, and Honors**

**Positions and Employment**

**2014 – 2014 Substitute Professor, General Chemistry, Faculdade Pitagoras, Divinopolis, MG, Brazil**

**2014 – 2014 Substitute Professor (Brazilian Public Service), Biostatistics, UFSJ, Divinopolis, MG, Brazil**

**2015 – 2015 Substitute Professor, Public Health, Epidemiology, and Biostatistics, UIT, Itauna, MG, Brazil**

**2019 – 2019 Postdoctoral Fellow, UNIFAL, Alfenas, MG, Brazil**

**2020 – 2025 Postdoctoral Fellow, Marshall University, Huntington, WV, US**

**2025 – Present Assistant Professor, Marshall University, Huntington, WV, US**

**Other Experiences**

**2013 – 2013 Internship Training, USP, Sao Paulo, SP, Brazil**

**2017 – 2018 Internship Training Fellowship, KUMC, Kansas City, KS, US**

**2018 – 2018 Effective Presentations Workshop, KUMC, Kansas City, US**

**2021 – 2021 Rodent Microsurgery and Hemodynamic Measurements Training Program, University of Wisconsin – Madison, Madison, WI, US**

**2021 – Present Teaching of mouse echocardiography for the Biomedical Research, Ph.D. Program, Marshall University, Huntington, WV, US**

**Honors**

**2009 – 2010 Scientific Initiation Scholarship (CNPq Agency), UFSJ, Divinopolis, MG, Brazil**

**2011 – 2011 Scientific Initiation Scholarship (FAPEMIG Agency), UFSJ, Divinopolis, MG, Brazil**

**2012 – 2013 MS Fellowship (CAPES Agency), UFSJ, Divinopolis, MG, Brazil**

**2013 – 2013 American Society for Biochemistry and Molecular Biology Graduate/Postdoctoral Travel Award at Experimental Biology Meeting, Boston, MA, US**

**2015 – 2018 PhD Fellowship (CAPES Agency), UFSJ, Divinopolis, MG, Brazil**

**2017 – 2018 PhD Fellowship, Sandwich Doctorate (CAPES Agency – PDSE Program), KUMC, Kansas City, KS, US**

**2019 – 2019 Postdoctoral Fellowship (CAPES Agency – PNPD Program), UNIFAL, Alfenas, MG, Brazil**

**2022 – 2023 American Heart Association (AHA) Postdoctoral Fellowship – 22POST917776 (Marco Pessoa)**

**2022 – 2022 Cell & Molecular Physiology Section Research Recognition Award – The American Physiological Society**

**C. Contributions to Science**

1. **Pharmacology/molecular modeling of novel NKA ligands. During my undergraduate, MS, and PhD, I have worked with a new series of** hemi-synthetic cardiotonic steroid derivatives to assess their binding to NKA and pharmacology in cancer cells.
2. Rocha SC, **Pessoa MT**, Neves LD, Alves SL, Silva LM, Santos HL, Oliveira SM, Taranto AG, Comar M, Gomes IV, Santos FV, Paixão N, Quintas LE, Noël F, Pereira AF, Tessis AC, Gomes NL, Moreira OC, Rincon-Heredia R, Varotti FP, Blanco G, Villar JA, Contreras RG, Barbosa LA. 21-Benzylidene digoxin: a proapoptotic cardenolide of cancer cells that up-regulates Na,K-ATPase and epithelial tight junctions. *PLoS One*. 2014 Oct 7;9(10):e108776. doi: 10.1371/journal.pone.0108776. PMID: 25290152; PMCID: PMC4188576.
3. Silva LND, **Pessoa MTC**, Alves SLG, Venugopal J, Cortes VF, Santos HL, Villar JAFP, Barbosa LA. Differences of lipid membrane modulation and oxidative stress by digoxin and 21-benzylidene digoxin. *Exp Cell Res*. 2017 Oct 1;359(1):291-298. doi: 10.1016/j.yexcr.2017.07.017. Epub 2017 Jul 15. PMID: 28720385.
4. **Marco Túlio C. Pessôa**; BARBOSA, L. A.; VILLAR, J. A. F. P. *Synthesis of Cardiac Steroids and Their Role on Heart Failure and Cancer*. In: Atta-ur-Rahman. (Org.). Studies in Natural Products Chemistry. 1ed. Amsterdam: Elsevier, 2018, v. 57, p. 79-113.
5. **Pessôa MTC**, Alves SLG, Taranto AG, Villar JAFP, Blanco G, Barbosa LA. Selectivity analyses of γ-benzylidene digoxin derivatives to different Na,K-ATPase α isoforms: a molecular docking approach. *J Enzyme Inhib Med Chem*. 2018 Dec;33(1):85-97. doi: 10.1080/14756366.2017.1380637. PMID: 29115894; PMCID: PMC6009882.
6. **Pessôa MTC**, Valadares JMM, Rocha SC, Silva SC, McDermott JP, Sánchez G, Varotti FP, Scavone C, Ribeiro RIMA, Villar JAFP, Blanco G, Barbosa LA. 21-Benzylidene digoxin decreases proliferation by inhibiting the EGFR/ERK signaling pathway and induces apoptosis in HeLa cells. *Steroids*. 2020 Mar;155:108551. doi: 10.1016/j.steroids.2019.108551. Epub 2019 Dec 6. PMID: 31812624; PMCID: PMC7028499.
7. Silva LND, Garcia IJP, Valadares JMM, **Pessoa MTC**, Toledo MM, Machado MV, Busch MS, Rocha I, Villar JAFP, Atella GC, Santos HL, Cortes VF, Barbosa LA. Evaluation of Cardiotonic Steroid Modulation of Cellular Cholesterol and Phospholipid. *J Membr Biol*. 2021 Dec;254(5-6):499-512. doi: 10.1007/s00232-021-00203-z. Epub 2021 Oct 29. PMID: 34716469.
8. de Oliveira GC, Rocha SC, da Silva Lopes MA, Paixão N, Alves SLG, **Pessoa MTC**, Noël F, Quintas LEM, Barbosa LA, Villar JAFP, Cortes VF. Implications of Synthetic Modifications of the Cardiotonic Steroid Lactone Ring on Cytotoxicity. *J Membr Biol*. 2021 Dec;254(5-6):487-497. doi: 10.1007/s00232-021-00186-x. Epub 2021 Jun 14. PMID: 34128090.
9. **Novel roles of NKA in the mouse heart and skeletal muscle.** Since joining MIIR as a postdoctoral fellow, I have developed systems to study the ability of NKA α1-specific signaling to control cardiac oxidative signaling and hypertrophy, as well as metabolism in the mouse skeletal muscle.
   1. Marck PV, **Pessoa MT**, Xu Y, Kutz LC, Collins DM, Yan Y, King C, Wang X, Duan Q, Cai L, Xie JX, Lingrel JB, Xie Z, Tian J, Pierre SV. Cardiac Oxidative Signaling and Physiological Hypertrophy in the Na/K-ATPase α1s/sα2s/s Mouse Model of High Affinity for Cardiotonic Steroids. *Int J Mol Sci*. 2021 Mar 27;22(7):3462. doi: 10.3390/ijms22073462. PMID: 33801629; PMCID: PMC8036649.
   2. Kutz LC, Cui X, Xie JX, Mukherji ST, Terrell KC, Huang M, Wang X, Wang J, Martin AJ, **Pessoa MT**, Cai L, Zhu H, Heiny JA, Shapiro JI, Blanco G, Xie Z, Pierre SV. The Na/K-ATPase α1/Src interaction regulates metabolic reserve and Western diet intolerance. *Acta Physiol (Oxf)*. 2021 Jul;232(3):e13652. doi: 10.1111/apha.13652. Epub 2021 Apr 4. PMID: 33752256; PMCID: PMC8570534.
   3. Cai L, Pessoa MT, Gao Y, Strause S, Banerjee M, Tian J, Xie Z, Pierre SV. The Na/K-ATPase α1/Src Signaling Axis Regulates Mitochondrial Metabolic Function and Redox Signaling in Human iPSC-Derived Cardiomyocytes. Biomedicines. 2023 Dec 2;11(12). doi: 10.3390/biomedicines11123207. PubMed PMID: 38137428; PubMed Central PMCID: PMC10740578.

**Complete list of published work in My Bibliography:**

<https://www.ncbi.nlm.nih.gov/myncbi/1zu71qmILuk5k/bibliography/public/>