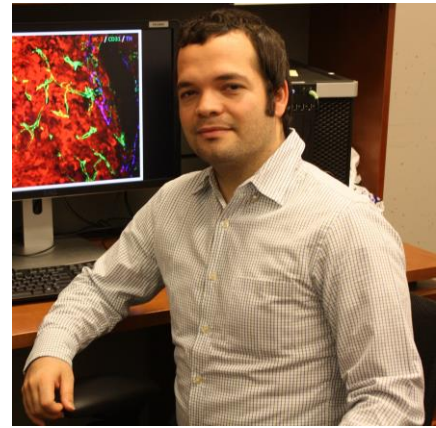


## CURRICULUM VITAE

### ALEXANDER BIRBRAIR

Department of Pathology  
Federal University of Minas Gerais  
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## EDUCATION

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(2016 – present) **Professor**, Department of Pathology, *Federal University of Minas Gerais*, Belo Horizonte, MG, Brazil.

(2014 – 2016) **Postdoc**, *Albert Einstein College of Medicine*, Bronx, NY, USA, Field of Study: Stem cell biology, Advisor: Paul S. Frenette, MD.

(2010 – 2014) **Ph.D.**, Neuroscience Program, *Wake Forest School of Medicine*, Winston-Salem, NC, USA, Field of Study: Stem cell biology, Advisor: Osvaldo Delbono, Ph.D., MD.

(2009 – 2010) **Research Scholar**, *Wake Forest School of Medicine*, Winston-Salem, NC, USA, Field of Study: Muscle biology, Advisor: Osvaldo Delbono, Ph.D, MD.

(2005 - 2009) **B.S.**, Biomedical Science, *Universidade Estadual de Santa Cruz, UESC*, Ilheus, Brazil, Field of Study: Genetics of microorganisms, Advisors: Rachel Passos Rezende, Ph.D. and Joao Carlos Teixeira Dias, Ph.D.

## HONORS AND AWARDS

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2019. Elected Member of the Global Young Academy

2017. Won the prestigious Instituto Serrapilheira Grant 2017-Call

2017. Elected Affiliated Member of the Brazilian Academy of Sciences

2015. Recipient of Gordon A. Melson Outstanding Doctoral Student Award for 2015

2014. Winner of 3-minute thesis (3MT) oral competition (2014 Fourteenth Annual Wake Forest University Graduate Student & Postdoc Research Day)

2014. Editor's choice in *Journal of Gerontology Biological Sciences* Volume 69 Issue 12 December 2014 for the manuscript "Human Slow Troponin T (TNNT1) Pre-mRNA Alternative Splicing is An Indicator of Skeletal Muscle Response to Resistance Exercise in Older Adults."

by Zhang T, Choi SJ, Wang ZM, **Birbrair A**, Messi ML, Jin J-P, Marsh AP, Nicklas B, and Delbono O.

2013. Awarded with the Glenn/AFAR Scholarship for Research in the Biology of Aging

2012. Wake Forest University Graduate and Postdoctoral Students Research Day (Troponin T nuclear localization and its role in skeletal muscle aging) (12th annual competition) (First place) (Co-author)

2008. “Metagenome of soil contaminated with petroleum.” Scholarship from : Fundação de Amparo à Pesquisa do Estado da Bahia (FAPESB), Brazil.

2006. “Best poster (Genetic diversity between isolates of *Chromobacterium violaceum*) presented in the area of biological sciences during the XII Seminário de Iniciação Científica da Universidade Estadual de Santa Cruz – UESC, Ilhéus – Bahia.”

## **PEER REVIEWED PUBLICATIONS**

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- (1) Picoli CC, Coimbra-Campos LMC, Guerra DAP, Silva WN, Prazeres PHDM, Costa AC, Magno LAV, Romano-Silva MA, Mintz A, **Birbrair A**. (2019) **Pericytes: Key Players in Spinal Cord Injury**. *Am J Pathol. In press*. PMID: 31014955.
- (2) Viana Magno LA, Tenza-Ferrer H, Collodetti M, Felipe Guimarães Aguiar M, Paula Carneiro Rodrigues A, Souza da Silva R, do Prado Silva J, Ferreira Nicolau N, Valadão Freitas Rosa D, **Birbrair A**, Marques Miranda D, Aurélio Romano-Silva M. (2019) **Optogenetic stimulation of the M2 cortex reverts motor dysfunction in a mouse model of Parkinson's Disease**. *J Neurosci. In press*. PMID: 30782975.
- (3) Andreotti JP, Silva WN, Costa AC, Picoli CC, Bitencourt FCO, Coimbra-Campos LMC, Resende RR, Magno LAV, Romano-Silva MA, Mintz A, **Birbrair A**. (2019) **Neural stem cell niche heterogeneity**. *Semin Cell Dev Biol. In press*. PMID: 30639325.
- (4) Barreto RSN, Romagnolli P, Cereta AD, Coimbra-Campos LMC, **Birbrair A**, Miglino MA. (2019) **Pericytes in the Placenta: Role in Placental Development and Homeostasis**. *Adv Exp Med Biol*. 1122:125-151. PMID: 30937867.
- (5) Henriques F, Lopes MA, Franco FO, Knobl P, Santos KB, Bueno LL, Correa VA, Bedard AH, Guilherme A, **Birbrair A**, Peres SB, Farmer SR, Batista ML Jr. (2018) **Toll-Like Receptor-4 Disruption Suppresses Adipose Tissue Remodeling and Increases Survival in Cancer Cachexia Syndrome**. *Sci Rep*. 8(1):18024. PMID: 30575787.
- (6) Paiva AE, Lousado L, Guerra DAP, Azevedo PO, Sena IFG, Andreotti JP, Santos GSP, Gonçalves R, Mintz A, **Birbrair A**. (2018) **Pericytes in the Premetastatic Niche**. *Cancer Res*. 78(11):2779-2786. PMID: 29789421.

- (7) Azevedo PO, Paiva AE, Santos GSP, Lousado L, Andreotti JP, Sena IFG, Tagliati CA, Mintz A, **Birbrair A.** (2018) **Cross-talk between lung cancer and bones results in neutrophils that promote tumor progression.** *Cancer Metastasis Rev. In press.* PMID: 30203108.
- (8) de Alvarenga EC, Silva WN, Vasconcellos R, Paredes-Gamero EJ, Mintz A, **Birbrair A.** (2018) **Promyelocytic leukemia protein in mesenchymal stem cells is essential for leukemia progression.** *Ann Hematol.* 97(10):1749-1755. PMID: 30069705.
- (9) Guerra DAP, Paiva AE, Sena IFG, Azevedo PO, Silva WN, Mintz A, **Birbrair A.** (2018) **Targeting glioblastoma-derived pericytes improves chemotherapeutic outcome.** *Angiogenesis. In press.* PMID: 29761249.
- (10) Azevedo PO, Sena IFG, Andreotti JP, Carvalho-Tavares J, Alves-Filho JC, Cunha TM, Cunha FQ, Mintz A, **Birbrair A.** (2018) **Pericytes modulate myelination in the central nervous system.** *J Cell Physiol.* 233(8):5523-5529. PMID: 29215724.
- (11) Silva WN, Leonel C, Prazeres PHDM, Sena IFG, Guerra DAP, Heller D, Diniz IMA, Fortuna V, Mintz A, **Birbrair A.** (2018) **Role of Schwann cells in cutaneous wound healing.** *Wound Repair Regen. In press.* PMID: 30098299.
- (12) Sena IFG, Paiva AE, Prazeres PHDM, Azevedo PO, Lousado L, Bhutia SK, Salmina AB, Mintz A, **Birbrair A.** (2018) **Glioblastoma-activated pericytes support tumor growth via immunosuppression.** *Cancer Med.* 7(4):1232-1239. PMID: 29479841.
- (13) Rodrigues ACZ, Messi ML, Wang ZM, Abba MC, Pereyra A, **Birbrair A,** Zhang T, O'Meara M, Kwan P, Lopez EIS, Willis MS, Mintz A, Files DC, Furdui C, Oppenheim RW, Delbono O. (2018) **The sympathetic nervous system regulates skeletal muscle motor innervation and acetylcholine receptor stability.** *Acta Physiol (Oxf). In press.* PMID: 30269419.
- (14) Naik PP, **Birbrair A,** Bhutia SK. (2018) **Mitophagy-driven metabolic switch reprograms stem cell fate.** *Cell Mol Life Sci. In press.* PMID: 30267101.
- (15) **Birbrair A.** (2018) **Pericyte Biology: Development, Homeostasis and Disease.** *Adv Exp Med Biol. In press.*
- (16) Santos GSP, Magno LAV, Romano-Silva MA, Mintz A, **Birbrair A.** (2018) **Pericytes plasticity in the brain.** *Neuroscience Bulletin. In press.* PMID: 30367336.
- (17) Prazeres PHDM, Turquetti AOM, Azevedo PO, Barreto RSN, Miglino MA, Mintz A, Delbono O, **Birbrair A.** (2018) **Perivascular cell  $\alpha$ v integrins as a target to treat skeletal muscle fibrosis.** *Int J Biochem Cell Biol.* 99:109-113. PMID: 29627438.

- (18) Andreotti JP, Paiva AE, Prazeres PHDM, Guerra DAP, Silva WN, Vaz RS, Mintz A, **Birbrair A.** (2018) **The role of natural killer cells in the uterine microenvironment during pregnancy.** Cell Mol Immunol. 15(11):941-943. PMID: 29572543.
- (19) Andreotti JP, Prazeres PHDM, Magno LAV, Romano-Silva MA, Mintz A, **Birbrair A.** (2018) **Neurogenesis in the postnatal cerebellum after injury.** Int J Dev Neurosci. 67:33-36. PMID: 29555564.
- (20) Silva WN, Prazeres PHDM, Paiva AE, Lousado L, Turquetti AOM, Barreto RSN, de Alvarenga EC, Miglino MA, Gonçalves R, Mintz A, **Birbrair A.** (2018) **Macrophage-derived GPNMB accelerates skin healing.** Exp Dermatol. 27(6):630-635. PMID: 29505115.
- (21) Costa MA, Paiva AE, Andreotti JP, Cardoso MV, Cardoso CD, Mintz A, **Birbrair A.** (2018) **Pericytes constrict blood vessels after myocardial ischemia.** J Mol Cell Cardiol. 116:1-4. PMID: 29371134.
- (22) Almeida VM, Paiva AE, Sena IFG, Mintz A, Magno LAV, **Birbrair A.** (2018) **Pericytes make spinal cord breathless after injury.** Neuroscientist. 24(5):440-447. PMID: 29283016.
- (23) Prazeres PHDM, Almeida VM, Lousado L, Andreotti JP, Paiva AE, Santos GSP, Azevedo PO, Souto L, Almeida GG, Filev R, Mintz A, Gonçalves R, **Birbrair A.** (2018) **Macrophages Generate Pericytes in the Developing Brain.** Cell Mol Neurobiol. 38(4):777-782. PMID: 28894964.
- (24) Guerra DAP, Paiva AE, Sena IFG, Azevedo PO, Batista ML Jr, Mintz A, **Birbrair A.** (2018) **Adipocytes role in the bone marrow niche.** Cytometry A. 93(2):167-171. PMID: 29236351.
- (25) Santos GSP, Prazeres PHDM, Mintz A, **Birbrair A.** (2018) **Role of pericytes in the retina.** Eye (Lond). 32(3):483-486. PMID: 29125148.
- (26) Andreotti JP, Lousado L, Magno LAV, **Birbrair A.** (2017) **Hypothalamic Neurons Take Center Stage in the Neural Stem Cell Niche.** Cell Stem Cell. 21(3):293-294. PMID: 28886362.
- (27) **Birbrair A.** (2017) **Stem Cell Microenvironments and Beyond.** Adv Exp Med Biol. 1041:1-3. PMID: 29204825.
- (28) Sena IFG, Prazeres PHDM, Santos GSP, Borges IT, Azevedo PO, Andreotti JP, Almeida VM, Paiva AE, Guerra DAP, Lousado L, Souto L, Mintz A, **Birbrair A.** (2017) **LepR+ cells dispute hegemony with Gli1+ cells in bone marrow fibrosis.** Cell Cycle. 16(21):2018-2022. PMID: 28976809.
- (29) Paiva AE, Lousado L, Almeida VM, Andreotti JP, Santos GSP, Azevedo PO, Sena IFG, Prazeres PHDM, Borges IT, Azevedo V, Mintz A, **Birbrair A.** (2017) **Endothelial cells as**

**precursors for osteoblasts in the metastatic prostate cancer bone.** *Neoplasia*. 19(11):928-931. PMID: 28957694.

(30) Lousado L, Prazeres PHDM, Andreotti JP, Paiva AE, Azevedo PO, Santos GSP, Filev R, Mintz A, **Birbrair A.** (2017) **Schwann cell precursors as a source for adrenal gland chromaffin cells.** *Cell Death and Disease*. 8(10):e3072. PMID: 28981120.

(31) Azevedo PO, Lousado L, Paiva AE, Andreotti JP, Santos GSP, Sena IFG, Prazeres PHDM, Filev R, Mintz A, **Birbrair A.** (2017) **Endothelial cells maintain neural stem cells quiescent in their niche.** *Neuroscience*. 363:62-65. PMID: 28893649.

(32) Coatti GC, Frangini M, Valadares MC, Gomes JP, Lima NO, Cavaçana N, Assoni AF, Pelatti MV, **Birbrair A,** de Lima ACP, Singer JM, Rocha FMM, Da Silva GL, Mantovani MS, Macedo-Souza LI, Ferrari MFR, Zatz M. (2017) **Pericytes Extend Survival of ALS SOD1 Mice and Induce the Expression of Antioxidant Enzymes in the Murine Model and in iPSCs Derived Neuronal Cells from an ALS Patient.** *Stem Cell Reviews and Reports*. 13:686-698. PMID: 28710685.

(33) Sena IFG, Prazeres PHDM, Santos GSP, Borges IT, Azevedo PO, Andreotti JP, Almeida VM, Paiva AE, Guerra DAP, Lousado L, Souto L, Mintz A, **Birbrair A.** (2017) **Identity of Gli1+ cells in the bone marrow.** *Exp Hematol*. 54:12-16. PMID: 28690072.

(34) Borges I, Sena I, Azevedo P, Andreotti J, Almeida V, Paiva A, Santos G, Guerra D, Prazeres P, Mesquita LL, Silva LSB, Leonel C, Mintz A, **Birbrair A.** (2017) **Lung as a Niche for Hematopoietic Progenitors.** *Stem Cell Reviews and Reports*. 13: 567-574. PMID: 28669077.

(35) **Birbrair A,** Borges IDT, Gilson Sena IF, Almeida GG, da Silva Meirelles L, Gonçalves R, Mintz A, Delbono O. (2017) **How Plastic Are Pericytes?** *Stem Cells Dev*. 26(14):1013-1019. PMID: 28490256.

(36) Dias Moura Prazeres PH, Sena IFG, Borges IDT, de Azevedo PO, Andreotti JP, de Paiva AE, de Almeida VM, de Paula Guerra DA, Pinheiro Dos Santos GS, Mintz A, Delbono O, **Birbrair A.** (2017) **Pericytes are heterogeneous in their origin within the same tissue.** *Dev Biol*. 427(1):6-11. PMID: 28479340.

(37) Pereira LX, Viana CTR, Orellano LAA, Almeida SA, Vasconcelos AC, Goes AM, **Birbrair A,** Andrade SP, Campos PP. (2017) **Synthetic matrix of polyether-polyurethane as a biological platform for pancreatic regeneration.** *Life Sciences*. 176:67-74. PMID: 28336399.

(38) Asada N, Kunisaki Y, Pierce H, Wang Z, Fernandez NF, **Birbrair A,** Ma'ayan A, Frenette PS. (2017) **Differential cytokine contributions of perivascular haematopoietic stem cell niches.** *Nature Cell Biology*. 19(3):214-223. PMID: 28218906.

- (39) **Birbrair A**, Sattiraju A, Zhu D, Zulato G, Batista I, Nguyen VT, Messi ML, Solingapuram Sai KK, Marini FC, Delbono O, Mintz A. (2017) **Novel Peripherally Derived Neural-Like Stem Cells as Therapeutic Carriers for Treating Glioblastomas**. *Stem Cells Translational Medicine*. 6(2):471-481. PMID: 28191774.
- (40) **Birbrair A**. (2016) **Learn new languages to get ahead**. *Nature Biotechnology*. 34:1073-1074. PMID: 27727214.
- (41) **Birbrair A** and Frenette PS. (2016). **Niche heterogeneity in the bone marrow**. *Annals of the New York Academy of Sciences*. 1370(1):82-96. PMID: 27015419.
- (42) Zhang T, Pereyra AS, Wang ZM, **Birbrair A**, Reisz JA, Files DC, Purcell L, Feng X, Messi ML, Feng H, Chalovich J, Jin JP, Furdui C, Delbono O. (2016) **Calpain inhibition rescues troponin T3 fragmentation, increases Cav1.1, and enhances skeletal muscle force in aging sedentary mice**. *Aging Cell*. 15(3):488-98. PMID: 26892246.
- (43) Khan JA, Mendelson A, Kunisaki Y, **Birbrair A**, Kou Y, Arnal A, Pinho S, Ciero P, Nakahara F, Ma'ayan A, Bergman A, Merad M and Frenette PS. (2015) **Identification of a portal vessel-associated fetal liver hematopoietic stem cell niche**. *Science*. 351:176-180. PMID: 26634440.
- (44) **Birbrair A** and Delbono O. (2015). **Pericytes are Essential for Skeletal Muscle Formation**. *Stem Cell Reviews and Reports*. 11(4):547-8. PMID: 25896402.
- (45) **Birbrair A**, Zhang T, Wang ZM, Messi ML, Mintz A and Delbono O. (2015). **Pericytes at the intersection between tissue regeneration and pathology**. *Clinical Science*. 128(2): 81–93. PMID: 25236972.
- (46) Zhang T, **Birbrair A**, Wang ZM, Messi ML, Marsh AP, Leng I, Nicklas BJ, Delbono O. (2015). **Improved knee extensor strength with resistance training associates with muscle specific miRNAs in older adults**. *Exp Gerontol*. 62:7-13. PMID: 25560803.
- (47) **Birbrair A**, Zhang T, Files DC, Mannava S, Smith T, Wang ZM, Messi ML, Mintz A, Delbono O. (2014). **Type-1 pericytes accumulate after tissue injury and produce collagen in an organ-dependent manner**. *Stem Cell Res Ther*. 5(6):122. PMID: 25376879.
- (48) **Birbrair A**, Zhang T, Wang ZM, Messi ML, Mintz A and Delbono O. (2014). **Pericytes: Multitasking Cells in the Regeneration of Injured, Diseased, and Aged Skeletal Muscle**. *Frontiers in Aging Neuroscience*. 6:245. PMID: 25278877.
- (49) **Birbrair A**, Zhang T, Wang ZM, Messi ML, Olson JD, Mintz A and Delbono O. (2014). **Type-2 Pericytes Participate in Normal and Tumoral Angiogenesis**. *Am J Physiol Cell Physiol*. 307 (1): C25-C38. PMID: 24788248
- (50) Zhang T, Choi SJ, Wang ZM, **Birbrair A**, Messi ML, Jin J-P, Marsh AP, Nicklas B, and Delbono O. (2014). **Human Slow Troponin T (TNNT1) Pre-mRNA Alternative Splicing is**

**An Indicator of Skeletal Muscle Response to Resistance Exercise in Older Adults.** J Gerontol A Biol Sci Med Sci. 69(12):1437-47. PMID: 24368775.

(51) **Birbrair A, T Zhang, ZM Wang, ML Messi, A Mintz and O Delbono.** (2013). **Type-1 Pericytes Participate in Fibrous Tissue Deposition in Aged Skeletal Muscle.** Am J Physiol Cell Physiol. 305 (11): C1098-C1113. PMID: 24067916.

(52) **Birbrair A, T Zhang, ZM Wang, ML Messi, GN Enikolopov, A Mintz and O Delbono.** (2013). **Role of Pericytes in Skeletal Muscle Regeneration and Fat Accumulation.** Stem Cells Dev. 22 (16): 2298-314. PMID: 23517218.

(53) Zhang, T, **Birbrair, A,** and Delbono, O. (2013). **Nonmyofilament-Associated Troponin T3 Nuclear and Nucleolar Localization Sequence and Leucine Zipper Domain Mediate Muscle Cell Apoptosis.** Cytoskeleton (Hoboken). 70(3):134-47. PMID: 23378072.

(54) **Birbrair A, T Zhang, ZM Wang, ML Messi, GN Enikolopov, A Mintz and O Delbono.** (2013). **Skeletal muscle neural progenitor cells exhibit properties of NG2-glia.** Exp Cell Res 319:45–63. PMID: 22999866.

(55) **Birbrair A, T Zhang, ZM Wang, ML Messi, GN Enikolopov, A Mintz and O Delbono.** (2013). **Skeletal muscle pericyte subtypes differ in their differentiation potential.** Stem Cell Res 10:67-84. PMID: 23128780.

(56) Zhang T, **Birbrair A,** ZM Wang, J Taylor, ML Messi and O Delbono. (2013). **Troponin T nuclear localization and its role in aging skeletal muscle.** Age (Dordr). 35(2):353-70. PMID: 22189912.

(57) **Birbrair A, ZM Wang, ML Messi, GN Enikolopov and O Delbono.** (2011). **Nestin-GFP transgene reveals neural precursor cells in adult skeletal muscle.** PLoS One 6:e16816. PMID: 21304812.

## **BOOKS**

**Birbrair A.** (2017). **Stem Cell Microenvironments and Beyond.** 1. ed. Springer Nature. Print ISBN: 978-3-319-69193-0. DOI: <https://doi.org/10.1007/978-3-319-69194-7>

**Birbrair A.** (2018). **Pericyte Biology – Novel Concepts.** 1. ed. Springer Nature. 978-3-030-02600-4. DOI: <https://doi.org/10.1007/978-3-030-02601-1>

**Birbrair A.** (2019). **Pericyte Biology in Different Organs.** 1. ed. Springer Nature. 978-3-030-11092-5. DOI: <https://doi.org/10.1007/978-3-030-11093-2>

**Birbrair A.** (2019). **Pericyte Biology in Disease.** 1. ed. Springer Nature. 978-3-030-16907-7. DOI: <https://doi.org/10.1007/978-3-030-16908-4>

**Birbrair A.** (2019). **Stem Cells Heterogeneity - Novel Concepts.** 1. ed. Springer Nature. 978-3-030-11095-6. DOI: <https://doi.org/10.1007/978-3-030-11096-3>

**Birbrair A.** (2019). **Stem Cells Heterogeneity in Cancer.** 1. ed. Springer Nature. 978-3-030-14365-7. DOI: <https://doi.org/10.1007/978-3-030-14366-4>

## **INVITED TALKS**

Birbrair A, Debisnki W (2011) **Are glioma stem cells for real?** Neuroscience tutorial, Wake Forest University, Winston-Salem, NC.

Birbrair A (2012) **Mobilizing a newly discovered neural-like stem cell against glioblastoma.** 9th Annual Retreat of the Brain Tumor Center of Excellence, Wake Forest University School of Medicine, NC

Birbrair A, Delbono O (2013) **Pericyte Heterogeneity in Tissue Repair with Aging.** WFU Pepper Center External Advisory Board meeting, Wake Forest University School of Medicine, NC

## **TEACHING EXPERIENCE**

---

Instructor in the **Basic Biochemistry course** for Biology, Nursing, Veterinary and Agronomy students, UESC, Brazil, 2006.

Instructor in the **Cellular Biology course** for Biology students, UESC, Brazil, 2007.

**"Techniques for Diagnoses of Intestinal Parasites"**, UESC, Brazil, 2007 (instructor of a short term course)

Instructor in the **Medical Bacteriology course** for Biomedicine students, UESC, Brazil, 2007.

Lecturer in **Pathology course** for Medicine, Biomedicine and Pharmacy, UFMG, Brazil, 2016-present

## **SERVICE**

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### *Institutional*

2013 Brain Awareness Outreach Presenter, visits to local K-12 schools



2014 Physiology Understanding (PhUn) Week Presenter, implemented basic physiology lab exercises and presented physiology concepts to K-12 students from Academy of Excellence, Success Institute Charter School and Statesville Christian School.

*Editor*

Stem Cell Reviews and Reports  
Molecular Biotechnology  
Frontiers in Cell and Developmental Biology  
Frontiers in Genetics  
Histology and Histopathology

*Ad Hoc Reviewer*

Experimental Neurology  
Journal of Cell Science  
Journal of Cellular and Molecular Medicine  
Journal of Cellular Physiology  
Plos One  
Stem Cell Research  
Stem Cell Reviews and Reports  
The American Journal of Pathology  
Pharmacology & Therapeutics  
Experimental Biology and Medicine  
Pathology, Research and Practice  
Experimental and Toxicologic Pathology  
Stem Cell Reports  
International Journal of Biochemistry & Cell Biology  
Journal of Neuroimmunology  
The Journal of Pathology  
Neural Regeneration Research  
Frontiers in Materials  
Molecular and Cellular Endocrinology  
Current Eye Research  
Biotechnology Advances  
AJP: Cell Physiology  
Frontiers in Cell and Developmental Biology  
Biomedicine & Pharmacotherapy  
Cancer Investigation  
Oncotarget  
Journal of Clinical Investigation  
Scientific Reports

## **LANGUAGES (FLUENT UNDERSTANDING, SPEAKING, WRITING, AND READING)**

English, Spanish, Hebrew, Portuguese, and Russian.

## **PROFESSIONAL MEMEBERSHIPS**

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- (1) American Heart Association (AHA): 2012 - present
- (2) Western NC Chapter of the Society for Neuroscience: 2011 – present
- (3) International Society for Stem Cell Research: 2013 - present

## **PROFESSIONAL REFERENCES**

---

### **Oswaldo Delbono, Ph.D., MD.**

Tenured Professor, Department of Internal Medicine, Gerontology and Geriatric Medicine  
and Physiology and Pharmacology

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**Waldemar Debinski, M.D., Ph.D.**

Center of Excellence Director, Brain Tumor Center of Excellence  
Tenured Professor, Neurosurgery  
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