

MARIA FERNANDA FORNI, PHD

EDUCATION, RESEARCH INTERESTS & EXPERIENCE

- Yale University, New Haven, CT** February 2019 - Current
Pew Postdoctoral Fellow
Molecular, Cellular and Developmental Biology (MCDB) Department
Project: Aging, metabolism and caloric restriction: novel mediators that modulate stem cell fate.
Advisor: Prof Valerie Horsley
- University of São Paulo, São Paulo, Brazil** 2014-2018
Fapesp Postdoctoral Fellow
FAPESP Fellowship #2013/04871-6 and FAPESP BEPE Fellowship #2016/22298-0
Biochemistry Department,
Project: Caloric restriction impact on skin stem cell homeostasis.
Advisor: Prof Alicia J. Kowaltowski/Prof Niels Olsen
- Yale University, New Haven, CT** 2017
Visiting Postdoctoral Fellow
Molecular, Cellular and Developmental Biology (MCDB) Department
Project: Bioenergetic alterations of dermal white adipose tissue precursors during caloric restriction.
Advisor: Prof Valerie Horsley
- Boston University, Boston, MA** 2015
Postdoctoral Fellow
Metabolism and Mitochondrial Biology Department
Project: Mitochondrial dynamics during mesenchymal stem cell commitment to differentiation.
Advisors: Prof Orian Shirihai
- University of São Paulo, São Paulo, Brazil** 2007-2014
University of Cambridge, Cambridge, UK
Ph.D Student
FAPESP Fellowship #2006/59199-7 and CAPES Fellowship #BEX 1284-10-0
Biochemistry Department
Thesis: Molecular mechanisms of glutathione depletion on skin stem cell homeostasis and aging.
Advisors: Prof Mari C. Sogayar and Prof Fiona Watt
- University of São Paulo, São Paulo, Brazil** 2001-2006
Undergraduate Research Fellow (Bachelor and Licentiate degree)
FAPESP Fellowship #2001/10624-4
Biology, Biology Institute
Senior Honors Thesis: Expression and dynamics of E-cadherin and connexin 43 expression in the Ehrlich tumor during the transition from ascitic to solid form.

HONORS & AWARDS

- 2021 **Selected for the ACT-ASCB Program: 2021/2022**
Yale MCDB Diversity Prize. May 2021
Society for Investigative Dermatology. Prize and Oral Presentation. May 2021.
- 2021 **SFFRi Society for Free Radicals Research International.** Prize for Women in Science Advocacy. March 2021.
- 2018 **Pew Latin American Fellow.** Yale University. Starting date: February 2019.
- 2017 **Best Poster. MCDB Department Retreat.** Yale University. Marine Biological Labs, Woods Hole, MA, USA.

- Young Scientist Award.** International Union of Biochemistry and Molecular Biology (IUBMB) Focused meeting on molecular aspects of aging & longevity. Athens, Greece.
- 2016 **Seahorse Travel Award** to: International Society for Stem Cell Research (ISSCR) Annual meeting, San Francisco, CA.
- SBBq Conesul Symposium. Young Scientist Platform Session.** Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology. Natal, Brazil. ♦ Selected for oral presentation.
- SBBq Conesul Symposium. Young Scientist Platform Session.** Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology. Natal, Brazil. ♦ Selected for oral presentation.
- 2015 **Young Scientist Program.** 44th Annual Meeting of IUBMB and SBBq. Foz do Iguaçu, Brazil. ♦ Selected for oral presentation.
- 2014 **Travel Award from the ISSCR.** To: Annual meeting of the International Society for Stem Cell Research, Vancouver, Canada. ♦ Selected for poster presentation.
- 2013 **SBBq Conesul Symposium. Young Scientist Platform Session.** Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology. Foz do Iguaçu, Brazil. ♦ Selected for oral presentation.
- 2012 **Travel Award from the ISSCR.** To: Annual meeting of the International Society for Stem Cell Research, Yokohama, Japan.
- Travel Award from the Chemistry Institute.** University of São Paulo, Brazil. To: ISSCR Annual meeting of the International Society for Stem Cell Research, Yokohama, Japan.
- 2011 **Travel Award from the South American Group of the Society for Free Radical Biology and Medicine** To: VII Meeting of South American Group of the SFRBM. São Pedro, SP, Brazil.
- 2009 **Best Graduate Poster/Project** - 1st Chemistry Institute Symposium. Chemistry Institute, University of São Paulo, Brazil.
- 2007 **14° SIICUSP (International Symposium of USP Scientific Undergraduate community)** Research Award for best undergraduate student project - University of São Paulo, Brazil.

PEER-REVIEWED PUBLICATIONS (★CORRESPONDING AUTHOR, # EQUAL CONTRIBUTION)

In preparation

Maria Fernanda Forni, Guillermo Rivera-Gonzalez, Alicia Juliana Kowaltowski, Valerie Horsley. Caloric restriction rewires aging in the skin by controlling quiescence and cell fate specification through the metabolic modulation of adipogenic precursors. *In preparation*.

Maria Fernanda Forni, Yiting Xu, Will Krause, Rebecca Pannone, Valerie Horsley. Adipocyte-derived fatty acids induce metabolic activation of macrophage differentiation in the wound bed, a process unpaired during aging. *In preparation*.

2021 **Maria Fernanda Forni**, Omar Amorocho, Leonardo Vinícius de Assis, Gabriela Kinker, Maria Nathalia Moraes, Ana Maria Castrucci, and Niels Camara. An immunometabolic shift modulates cytotoxic lymphocyte activation during melanoma progression in TRPA1 channel null mice. *Frontiers in Oncology*. Accepted.

2020 Rodrigues TS, Alvarez ARP, Gembre AF, **Forni MF**, de Melo BMS, Alves Filho JCF, Câmara NOS, Bonato VLD. Mycobacterium tuberculosis-infected alveolar epithelial cells modulate dendritic cell function through the HIF-1 α -NOS2 axis. *J Leukoc Biol*. 2020 Oct;108(4):1225-1238. doi: 10.1002/JLB.3MA0520-113R.

2018 **MF Forni #**, T Assis-Ribas #, Sheila Winnischofer, Mari Sogayar, Marina Trombetta-Lima. (# authors contributed equally). Extracellular matrix dynamics during mesenchymal stem cell differentiation. *Dev Biol*. May 15;437(2):63-74. doi: 10.1016/j.ydbio.2018.03.002.

2017 de Carvalho AETS, Bassaneze V, **Forni MF**, Keusseyan AA, Kowaltowski AJ, Krieger JE. Early Postnatal Cardiomyocyte Proliferation Requires High Oxidative Energy Metabolism. *Sci Rep*. 2017 Nov 13;7(1):15434. doi: 10.1038/s41598-017-15656-3.

Forni MF, Peggia J, Braga TT, Chinchilla JEO, Iannini CAN, Camara NOS, Kowaltowski AJ. Caloric restriction impacts stem cell homeostasis promoting enhanced thermoregulation through metabolic changes in the skin. *Cell Reports*, in press. *Cell Rep.* 2017 Sep 12;20(11):2678-2692. doi: 10.1016/j.celrep.2017.08.052.

Forni MF, Garcia-Neto W, Kowaltowski AJ. An active-learning methodology for teaching mitochondrial electron transport chain. *Medical Education*, in press

Braga T, **Forni MF**, Correa-Costa M, Ramos R, Barbuto J, Branco P, Castoldi A, Hiyane M, Davanso M, Latz E, Franklin B, Kowaltowski AJ, and Câmara NOS. Soluble uric acid activates the NLRP3 inflammasome. *Scientific Reports.* (2017) Jan 13;7:39884. doi: 10.1038/srep39884

Luévano-Martínez LA, **Forni MF**, Peggia J, Watanabe Li-Sei, Kowaltowski AJ. Calorie restriction activates cardiolipin biosynthesis and externalization to the outer mitochondrial membrane. *Mech Ageing Dev.* (2017) Mar;162:9-17. doi: 10.1016/j.mad.2017.02.004

Gomes KM, Costa IC, Santos JF, Dourado PM, **Forni MF**, Ferreira JC. Induced pluripotent stem cells reprogramming: Epigenetics and applications in the regenerative medicine. *Rev Assoc Med Bras.* (2017) Feb;63(2):180-189. doi: 10.1590/1806-9282.63.02.180.

2016 **Forni MF**, Chausse B, Peggia J, Kowaltowski AJ. Bioenergetic profiling in the skin. *Exp Dermatol.* (2016) Feb;25(2):147-8. doi: 10.1111/exd.12856.

★ **Forni MF**, Peggia J, Trudeau K, Shirihai O, Kowaltowski AJ. Murine mesenchymal stem cell commitment to differentiation is regulated by mitochondrial dynamics. *Stem Cells.* (2016) Mar;34(3):743-55. doi: 10.1002/stem.2248.

Amigo I#, da Cunha FM#, **Forni MF**#, Garcia-Neto W#, Kakimoto PA#, Luévano-Martínez LA#, Macedo F#, Menezes-Filho SL#, Peggia J#, Kowaltowski AJ. Mitochondrial form, function and signalling in aging. *Review. Biochemical Journal.* (2016) Oct 15;473(20):3421-3449.

2015 **Forni MF**, Ramos Maia Lobba A, Pereira Ferreira AH, Sogayar MC. Simultaneous isolation of three different stem cell populations from murine skin. *PLoS One.* (2015) Oct 13; 10: e0140143. doi: 10.1371/journal.pone.0140143.

Luévano-Martínez LA, **Forni MF**, dos Santos VT, Souza-Pinto NC, Kowaltowski AJ. Cardiolipin is a key determinant for mtDNA stability and segregation during mitochondrial stress. *Biochim Biophys Acta.* (2015) 1847(6-7): 587-98. doi: 10.1016/j.bbabi.2015.03.007.

2013 **Forni MF**, Loureiro RR, Cristovam PC, Bonatti JA, Gomes JAP, Sogayar MC. Comparison between different biomaterial scaffolds for human limbal derived stem cells growth and enrichment. *Current Eye Research.* (2013) Jan; 38(1):27-34.

Halcsik E, **Forni MF**, Fujita A, Verano-Braga T, Jensen ON, Sogayar MC. New insights in osteogenic differentiation revealed by mass spectrometric assessment of phosphorylated substrates in murine skin mesenchymal cells. *BMC Cell Biol.* (2013) Oct 22;14:47.

2012 **Forni MF**, Lima MT, Sogayar MC. Embryonic skin development: stem cells rising in epidermis. *Biological Research.* (2012); 45(3) :215-22.

Lobba ARM, **Forni MF**, Carreira ACO, Sogayar MC. Differential expression of CD90 and CD14 stem cell markers in malignant breast cancer cell lines. *Cytometry* (2012) Dec; 81(12):1084-91.

2009 TC Carneiro-Lobo, A Mariano-Oliveira, S Konig, **MF Forni**, JM C Ribeiro, IMB Francischetti, MC Sogayar, RQ Monteiro. IXOLARIS, a potent exogenous inhibitor of factor VIIa/Tissue Factor complex blocks primary tumor growth in a glioblastoma model. *J T Haemostasis* (2009) 7(11) pp1855-1864.

2008 Sartori A, Garay-Malpartida, **Forni MF**, Schumacher R, Dutra F, Sogayar MC, Bechara E. Aminoacetone, a putative endogenous source of methylglyoxal, causes oxidative stress and death to insulin-producing RINm5f cells. *Chem Res Toxicol.* (2008) 21 (9), pp 1841-1850.

INVITED TALKS

- 2018** **How to study immunometabolism.** SBI (Brazilian Society of Immunology) International Congress. Juiz de Fora, Minas Gerais, Brazil.
- 2018** **Caloric restriction modulates dermal white adipose tissue precursor metabolism impacting quiescence.** Cell Biology Department Talk. Biomedicine Institute, University of São Paulo, São Paulo, Brazil.
- 2017** **Caloric restriction modulates dermal white adipose tissue homeostasis.** Yale Stem Cell Research Forum. New Haven, Connecticut, USA.
- 2016** **Stem cells and ageing: How caloric restriction can modulate longevity.** Biology Week – SESBIO. Federal Institute for the Sciences and Technology. São Paulo, São Paulo, Brazil.
- 2015** **Mitochondrial dynamics and stem cell differentiation.** Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.
Heat and fur: Why it matters. Biology of the Malignant Transformation. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.
Impact of caloric restriction on skin stem cell homeostasis. V Meeting on Metabolic syndrome. Mato Grosso University. Cuiabá, Brazil.
- 2014** **Short talk: Metabolism and ageing of skin stem cells.** Annual Meeting of the International Society for Stem Cell Research. Vancouver, Canada.
Mitochondrial regulation of mesenchymal stem cell fate (Babraham Institute, UK - USP, UNIFESP and UNICAMP) Maresias, São Paulo, Brazil.
Metabolic plasticity and longevity impact of stem cells during caloric restriction protocols. Biology of the Malignant Transformation. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.
- 2011** **Skin stem cell homeostasis and embryonic development: a role for oxidative stress.** In: Molecular Biology of the Malignant Transformation. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.
Forkhead-Homeobox-type-O (FOXO) driven epidermal embryonic morphogenesis and epidermal stem cell differentiation is glutathione dependent and occurs through the PI3/Akt pathway. In: VII Meeting of South American Group of the SFRBM. São Pedro, São Paulo, Brazil.
- 2010** **Murine skin as a source of multipotent stem cells.** In: Stem Cells: Hopes, Fears and Reality (Section: Isolation and Manipulation of Stem Cells) Berlin Brandenburg School of Regenerative Medicine. Berlin, Germany
- 2009** **Oxidative stress impact on skin mesenchymal stem cells.** In: Molecular Biology of the Malignant Transformation. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.
Isolation, characterization and differentiation of skin stem cells. In: First Natura-NUCEL Proteomics Symposia, Cajamar, São Paulo, Brazil.
Proliferation, senescence and death of skin stem cells. In: International Stem Cell Meeting. Incof/British Council, São Paulo, São Paulo, Brazil.
- 2007** **Cancer stem cells.** In: Molecular Biology of the Malignant Transformation. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.

EDITORIAL WORK

Reviewer/Referee activity

- 2019 - present** Journal of Investigative Dermatology
- 2018 - present** Frontiers in Genetics
- 2018 - present** Frontiers in Cell and Developmental Biology
- 2017 - present** Cell Reports
- 2016 - present** Scientifica
- 2016 - present** Scientific Reports
- 2016 - present** Oxidative Medicine and Cellular Longevity
- 2015 - present** Investigative Dermatology and Venerology Research
- 2015 - present** PLoS ONE
- 2014 - present** Mechanisms of Ageing and Development
- 2014 - present** Free Radical Biology & Medicine

Editorial activity

2018 - present Review Editor (Stem Cell Research) *Frontiers in Cell and Developmental Biology*

2016 - present Scientific Editor (Health) *Frontiers for Young Minds*

2015 - present Project Reviewer - Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)

SCIENCE OUTREACH

For middle/secondary school students

2019 **Girls in Science Education.**

Yale University, New Haven, Connecticut, USA.

2011 **Hands on Course /Workshop: Biotechnology in the classroom.**

See-Saw Panamby Bilingual School and Chemistry Institute, University of São Paulo, São Paulo, Brazil.

For undergraduate students

2014 **Invited Talk: Metabolism and stem cells: self-renewal, differentiation and aging.**

Undergraduate Science Week – Biology Institute, University of São Paulo, São Paulo, Brazil.

Course: DNA damage response – implications for aging and cancer.

Biomedical Institute, University of São Paulo, São Paulo, Brazil.

2009 **VI Summer School on Molecular Biology and Biochemistry.**

Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.

For graduate students

2009, 2010, 2011

Winter School on Advanced Molecular Biology and Biochemistry. Flow Cytometry. Biochemistry department, Chemistry Institute, University of São Paulo, São Paulo, Brazil.

PRESS AND POPULAR SCIENCE PUBLICATIONS

2020 ASCB June Newsletter. **How scientific trainees can navigate the hurdles imposed by COVID-19: an interview with Sharon Milgran.**

Interview - Radical View: **Prof. Kivanc Birsoy.** DOT Newsletter Society for Redox Biology and Medicine (SfRBM).

2018 Interview - Radical View: **Prof. Ines Batinic-Haberle.** DOT Newsletter Society for Redox Biology and Medicine (SfRBM).

Interview - Radical View: **Prof. Mike Murphy.** DOT Newsletter SfRBM.

2017 Interview - Radical View: **Prof. Ohara Augusto.** DOT Newsletter SfRBM.

2015 Short article Mitochondria can dictate your fate, especially if you are a stem cell. Redoxoma Newsletter.

Short article: Stem Cell Fate. FAPESP Magazine.

Short article: Mitochondrial dynamics regulate mesenchymal stem cell fate. Authors: Maria Fernanda Forni, Alicia Kowaltowski and Maria Celia Wider. CEPID Redoxoma Newsletter.

MEMBERSHIP & SERVICE

2020 – 2021 **Intersection Symposium**

- **Selection Committee**

- **Organizing Committee** - Panel lunch with the new PIs: organized and moderated

2020 – present **MCDB Yale Diversity Committee**

2020 – present **Postdoctoral Member of the WICB Board ASCB** - Women in Cell Biology.

2019 – present **Board Member WISAY** - Women in Science at Yale.

2018 – 2020 **Elected Young council Board (term 2 years).** Society for Redox Biology in Medicine.

2017 – 2020 **Dot Newsletter Board.** Society for Redox Biology and Medicine (SfRBM).

2015 – present **Women in Science Committee (WIS)** - Society for Redox Biology and Medicine (SfRBM).

2016 – present **Member American Society for Cell Biology.**

2015 – present **Member International Society for Stem Cell Research.**

2014 – present **Member Society for Redox Biology in Medicine.**