

Ana Bastos de Carvalho, MD

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POSITIONS

- **Assistant Professor** 08/2019 — Present
Department of Ophthalmology & Visual Sciences, College of Medicine,
University of Kentucky
- **Founding Co-Director** 04/2017 — Present
Global Ophthalmology (UKGO) Division, Department of Ophthalmology &
Visual Sciences, College of Medicine, University of Kentucky
- **Director** 04/2017 — Present
Implementation Science Lab, Department of Ophthalmology & Visual
Sciences, College of Medicine, University of Kentucky
- **Fellow, Clinical Instructor** 04/2017 — 07/2019
Department of Ophthalmology & Visual Sciences, College of Medicine,
University of Kentucky
- **Postdoctoral Scholar** 11/2011 — 06/2016
Mentor: Jayakrishna Ambati; Department of Ophthalmology & Visual
Sciences, College of Medicine, University of Kentucky
- **Attending Physician** 08/2010 — 10/2011
Department of Ophthalmology, Centro Hospitalar Lisboa Norte, EPE -
Hospital de Santa Maria, Lisbon, Portugal
- **Lecturer** 09/2007 — 10/2011
Departments of Ophthalmology and Anatomy, Lisbon Medical School,
Lisbon, Portugal

EDUCATION

- **PhD Candidate** 11/2011 — Present
Gulbenkian / Champalimaud Program, Advanced Medical Education
- **Doctor Medicinæ** 09/1997 — 11/2003
University of Lisbon Medical School, Lisbon, Portugal

TRAINING

- **Training Institute in Dissemination and Implementation Science in
Health** 08/2018 — 12/2018
National Institutes of Health
- **Medical Vitreoretinal Diseases Fellowship** 07/2017 — 07/2019
Department of Ophthalmology & Visual Sciences, University of Kentucky
- **International Retina Rotation** 11/2009
Supervisor: Carlos Pavesio; Medical Retina Department, Moorfields Eye
Hospital, London, UK
- **Ophthalmology Residency** 09/2005 — 10/2010

- North Lisbon Hospital Centre, Lisbon, Portugal
- **General Internship** 01/2004 — 08/2005
North Lisbon Hospital Centre, Lisbon, Portugal
 - **Clinical Research Elective** 11/2003
Supervisor: Carmen Puliafito; Medical Retina Department, Center for Retinal Vascular Biology, Bascom Palmer Eye Institute
 - **Research Elective** 09/2001
Supervisor: Jan Hoeijmakers; Erasmus University, Rotterdam, Netherlands
 - **Clinical Elective** 08/2001
Supervisor: Arvin Dibra; Department of General Surgery, Policlinico Umberto I, Rome, Italy

LICENSES & CERTIFICATIONS

- **FLO50, Kentucky Board of Medical Licensure** 04/2017 — Present
- **USMLE STEP 3** 04/2017
- **Education Commission for Foreign Medical Graduates (ECFMG) Certification** 11/2016
- **Board Certification in Ophthalmology, Lisbon, Portugal** 07/2010

HONORS, PRIZES, AWARDS & SCHOLARSHIPS

- **First prize, Poster presentations** 2018
Appalachian Research Day, Hazard KY
- **Winner** 2015
AUPO/RPB Resident and Fellow Research Forum, Phoenix, AZ
- **First prize, Oral presentations** 2015
- **Travel Grant**
UTMB Sun and Science National Eye Research Conference, Galveston, TX
- **Travel Grant** 2014
XXI ISER Meeting, San Francisco, CA
- **First prize, poster in Vitreous / Retina section** 2013
Congress of the European Association for Vision and Eye Research, Nice, France
- **Lecture Prize for Young Clinician-Scientist** 2012
European Ophthalmology Society
- **Science and Technology Foundation Scholarship** 2009 — 2011
Portuguese Science Ministry, Lisbon, Portugal
- **Champalimaud / Calouste Gulbenkian Scholarship** 2009
University of Lisbon Medical School, Lisbon, Portugal
- **International Fellowship** 2009
Portuguese Society of Ophthalmology, Lisbon, Portugal
- **Erasmus Scholarship** 2001
University of Lisbon Medical School, Lisbon, Portugal

LEADERSHIP IN GLOBAL OPHTHALMOLOGY

- **Fayette County Public Schools In-School Eyecare Program** July 2019 — Present
 Development of program to provide accessible on-site eye care to all elementary school students in Fayette County, Kentucky.
- **Ophthalmology workforce capacity building — Universidad Central (Quito) and Fundacion Loor (Manta)** July 2018 — Present
 Establishment of partnerships with both organizations, human capacity support for training at the Ophthalmology residency program (UC) and at the foundation (Loor). Quito & Porto Viejo, Ecuador
- **Residency Partnership with Hôpital de l'Université d'Etat du Haiti** July 2018 — Present
 Ophthalmology residency program curriculum building and resident training. Port-au-Prince, Haiti
- **All Eyes on Appalachia** April 2017 — Present
 Outreach clinics (with a team of volunteers) providing full eye exams, diagnosis, follow-up, and spectacles to underserved patients throughout rural Kentucky, free of charge. Kentucky
- **Diabetic Retinopathy Screening Network** April 2017 — Present
 Expansion and optimization of statewide telemedicine diabetic retinopathy screening program in primary care centers.

RESEARCH FUNDING & GRANT SUPPORT

- **Dean's Research Startup Fund, College of Medicine, University of Kentucky** 2019 — 2022
 Bastos-Carvalho, A (PI).
 Development of an implementation strategy to optimize uptake of telemedicine diabetic retinopathy screening in primary care.
- **Cincinnati Eye Institute Ignite grant** 01/2019 — 12/2019
 Bastos-Carvalho, A (PI), \$20,000
 Development of an implementation strategy to optimize uptake of telemedicine diabetic retinopathy screening in primary care.
- **Regeneron investigator-initiated grant** 01/2019 — 12/2019
 Bastos-Carvalho, A and Northrip, K (Multi-PI), \$485,487
 Optimizing disease management: a vision for diabetic eye screening.
- **University of Kentucky Center For Clinical and Translational Science Early Career Clinician Scientist Award** 07/2018 — 06/2021
 Bastos-Carvalho, A (PI), 50% salary support and \$50,000
 Development of an implementation strategy to optimize uptake of telemedicine diabetic retinopathy screening in primary care.
- **Washington University Diabetes Research Center Pilot Grant** 03/2018 — 11/2019
 Bastos-Carvalho, A (PI), \$40,000
- **Bayer Global Ophthalmology Awards Program – Research Award** 01/2014 — 12/2014
 Bastos-Carvalho, A (PI), \$50,000
 Mechanisms of geographic atrophy expansion in age-related macular degeneration.
- **Portuguese Society of Ophthalmology Research Grant** 01/2007 — 12/2007
 Bastos-Carvalho, A (PI)

mfERG and OCT in patients with unexplained visual acuity loss.

- **Portuguese Society of Ophthalmology Research Grant** 01/2006 — 12/2006
Bastos-Carvalho, A (PI)
Measurement of growth factors in the aqueous humor of patients with diabetic retinopathy.
- **AstraZeneca Grant for Medical Research — Young Investigators** 09/2005 — 08/2006
Bastos-Carvalho, A (PI)
Measurement of intraocular growth factors in patients with diabetic retinopathy.

AUTHORSHIP: PEER-REVIEWED

- **IVIG prevents inflammatory diseases via inhibition of the NLRP3 inflammasome.** In revision
Ana Bastos-Carvalho, Reo Yasuma, Younghee Kim, Takako Fukuhara, Shinichi Fukuda, Benjamin J. Fowler, Abdallah Mahrous, Bradley K. Taylor, Craig Vander Kooi, Jeanette Leusen, Sjef Verbeek, David R. Hinton, Junichi Fukuhara, Romulo J. Albuquerque, Nagaraj Kerur, Bradley D. Gelfand, Jayakrishna Ambati.
- **cGAS drives non-canonical inflammasome activation in age-related macular degeneration.** January 2018
Nature Medicine
10.1038/nm.4450
Nagaraj Kerur, Shinichi Fukuda, Daipayan Banerjee, Younghee Kim, Dongxu Fu, Ivana Apicella, Akhil Varshney, Reo Yasuma, Benjamin J. Fowler, Elmira Baghdasaryan, Kenneth M. Marion, Xiwen Huang, Tetsuhiro Yasuma, Yoshio Hirano, Vlad Serbulea, Meenakshi Ambati, Vidya L. Ambati, Yuji Kajiwaru, Kameshwari Ambati, Ana Bastos-Carvalho, Yuichiro Ogura, Hiroko Terasaki, Tetsuro Oshika, Kyung Bo Kim, David R. Hinton, Norbert Leitinger, John C. Cambier, Joseph D. Buxbaum, M. Cristina Kenney, S. Michal Jazwinski, Hiroshi Nagai, Isao Hara, A. Phillip West, Katherine A. Fitzgerald, SriniVas R. Sadda, Bradley D. Gelfand, Jayakrishna Ambati.
- **Human IgG1 antibodies suppress angiogenesis in a target-independent manner.** January 2016
Signal Transduction and Targeted Therapy
10.1038/sigtrans.2015.1
Sasha Bogdanovich, Younghee Kim, Takeshi Mizutani, Reo Yasuma, Laura Tudisco, Valeria Cicatiello, Ana Bastos-Carvalho, Nagaraj Kerur, Yoshio Hirano, Judit Z Baffi, Valeria Tarallo, Shengjian Li, Tetsuhiro Yasuma, Parthasarathy Arpitha, Benjamin J Fowler, Charles B Wright, Ivana Apicella, Adelaide Greco, Arturo Brunetti, Menotti Ruvo, Annamaria Sandomenico, Miho Nozaki, Ryo Ijima, Hiroki Kaneko, Yuichiro Ogura, Hiroko Terasaki, Balamurali K Ambati, Jeanette HW Leusen, Wallace Y Langdon, Michael R Clark, Kathryn L Armour, Pierre Bruhns, J Sjef Verbeek, Bradley D Gelfand, Sandro De Falco and Jayakrishna Ambati.
- **Intravenous immune globulin suppresses angiogenesis in mice and humans.** January 2016
Signal Transduction and Targeted Therapy
10.1038/sigtrans.2015.2
Reo Yasuma, Valeria Cicatiello, Takeshi Mizutani, Laura Tudisco, Younghee Kim, Valeria Tarallo, Sasha Bogdanovich, Yoshio Hirano, Nagaraj Kerur, Shengjian Li, Tetsuhiro Yasuma, Benjamin J Fowler, Charles B Wright, Ivana Apicella, Adelaide Greco, Arturo Brunetti, Balamurali K Ambati, Sevim Barbasso Helmers, Ingrid E Lundberg, Ondrej Viklicky, Jeanette HW

Leusen, J Sjeff Verbeek, Bradley D Gelfand, Ana Bastos-Carvalho, Sandro De Falco and Jayakrishna Ambati.

- **Iron Toxicity in the Retina Requires Alu RNA and the NLRP3 Inflammasome.** June 2015
Cell Reports
10.1016/j.celrep.2015.05

Gelfand BD, Wright CB, Kim Y, Yasuma T, Yasuma R, Li S, Fowler BJ, Bastos-Carvalho A, Kerur N, Uittenbogaard A, Han YS, Lou D, Kleinman ME, McDonald WH, Núñez G, Georgel P, Dunaief JL, Ambati J.
- **Powerful anti-tumor and anti-angiogenic activity of a new anti-vascular endothelial growth factor receptor 1 peptide in colorectal cancer models.** April 2015
Oncotarget
PMC4496375

Cicatiello V, Apicella I, Tudisco L, Tarallo V, Formisano L, Sandomenico A, Kim Y, Bastos-Carvalho A, Orlandi A, Ambati J, Ruvo M, Bianco R, De Falco S.
- **IL-18 is not therapeutic for neovascular age-related macular degeneration.** December 2014
Nature Medicine
10.1038/nm.3671

Hirano Y, Yasuma T, Mizutani T, Fowler BJ, Tarallo V, Yasuma R, Kim Y, Bastos-Carvalho A, Kerur N, Gelfand BD, Bogdanovich S, He S, Zhang X, Nozaki M, Ijima R, Kaneko H, Ogura Y, Terasaki H, Nagai H, Haro I, Núñez G, Ambati BK, Hinton DR, Ambati J.
- **Nucleoside reverse transcriptase inhibitors possess intrinsic anti-inflammatory activity.** November 2014
Science
10.1126/science.1261754

Fowler BJ, Gelfand BD, Kim Y, Kerur N, Tarallo V, Hirano Y, Amarnath S, Fowler DH, Radwan M, Young MT, Pittman K, Kubes P, Agarwal HK, Parang K, Hinton DR, Bastos-Carvalho A, Li S, Yasuma T, Mizutani T, Yasuma R, Wright C, Ambati J.
- **DICER1/Alu RNA dysmetabolism induces Caspase 8-mediated cell death in age-related macular degeneration.** November 2014
Proceedings of the National Academy of Sciences
10.1073/pnas.1403814111

Kim Y, Tarallo V, Kerur N, Yasuma T, Gelfand BD, Bastos-Carvalho A, Hirano Y, Yasuma R, Mizutani T, Fowler BJ, Li S, Kaneko H, Bogdanovich S, Ambati BK, Hinton DR, Hauswirth WW, Hakem R, Wright C, Ambati J.
- **TLR-independent and P2X7 dependent signaling regulates Alu RNA-induced NLRP3 inflammasome activation in geographic atrophy.** November 2013
Investigative Ophthalmology & Visual Science
10.1167/iovs.13-12500

Kerur N, Hirano Y, Tarallo V, Fowler B, Bastos-Carvalho A, Yasuma T, Yasuma R, Kim Y, Hinton D, Kirschning C, Gelfand B, Ambati J.
- **Photoreceptor avascular privilege is shielded by soluble VEGF receptor-1.** June 2013
eLife
10.7554/eLife.00324

Luo L, Uehara H, Zhang X, Das SK, Olsen T, Holt D, Simonis JM, Jackman K, Singh N, Miya TR, Huang W, Ahmed F, Bastos-Carvalho A, Le YZ, Mamalis C, Chiodo VA, Hauswirth WW, Baffi J, Lacal PM, Orecchia A, Ferrara N, Gao G, Young-Hee K, Fu Y, Owen L, Albuquerque R, Baehr W, Thomas K, Li DY, Chalam KV, Shibuya M, Grisanti S, Wilson DJ, Ambati J, Ambati BK.
- **Context- and cell-dependent effects of Delta-like 4 targeting in the bone marrow microenvironment.** December 2012
PLoS One
10.1371/pone.0052450

Remédio L, Carvalho T, Caiado F, Bastos-Carvalho A, Martins D, Duarte A, Yagita H, Dias S.
- **Leukocoria in a child with Sturge-Weber syndrome.** February 2012
Neuroradiology Journal

Geraldo A, Bastos-Carvalho A, Neto L, Sousa R, Sequeira P.
- **Retinal hemangioblastoma in von Hippel Lindau disease.** Bastos-Carvalho A, Damato B. July 2010
New England Journal of Medicine

10.1056/NEJMicm0912768

AUTHORSHIP: BOOK CHAPTERS

- Pathophysiology of macular edema: results from basic research. Switzerland, 2015
Intravitreal Steroids. Springer International
Ana Bastos-Carvalho, Jayakrishna Ambati. A. J. Augustin (ed). 10.1007/978-3-319-14487-0_1
- Medical Semiology: Principles, Methods, and Interpretation. Semiology of Lisboa, 2007
the visual apparatus. Lidell
Manuel Monteiro-Grillo M, Ana Bastos-Carvalho. J. Ducla Soares (ed). 978-972-757-426-1

PRESENTATIONS

- Implementation of a Diabetic Retinopathy screening program for underserved populations May 2018
Ana Bastos de Carvalho, Eric B. Higgins, Rob Sprang. National Rural Health Association, New Orleans, LA
- Global ophthalmology: curing blindness in Appalachia and beyond. April 2018
Ana Bastos de Carvalho. Appalachian Research Day, Hazard, KY
- Global ophthalmology: a peek at regional and international needs, success cases and future perspectives. November 2016
Ana Bastos de Carvalho. Annual Midwest Global Health Conference, Lexington, KY
- Global ophthalmology: a peek at regional and international needs, success cases and future perspectives. July 2016
Ana Bastos de Carvalho. Global Health Seminar Series, University of Kentucky, Lexington, KY
- Nucleoside reverse transcriptase inhibitor (NRTI) protection against iron cytotoxicity. May 2015
Charles B Wright, Younghee Kim, Tetsuhiro Yasuma, Reo Yasuma, Shengjian Li, Benjamin J Fowler, Ana Bastos-Carvalho, Mark Kleinman, Jayakrishna Ambati, Bradley D Gelfand. ARVO Denver, CO
- Innate immune mechanisms of Alu RNA-induced age-related macular degeneration. April 2015
Nagaraj Kerur, Younghee Kim, Ana Bastos-Carvalho, Benjamin Fowler, Tetsuhiro Yasuma, Bradley Gelfand, Jayakrishna Ambati. Keystone Symposia: Innate Immunity and Determinants of Microbial Pathogenesis Olympic Valley, CA
- IgG1 antibodies generically inhibit ocular neovascularization. January 2015
Ana Bastos-Carvalho, Sasha Bogdanovich, Younghee Kim, Reo Yasuma, Takeshi Mizutani, Nagaraj Kerur, Valeria Tarallo, Shengjian Li, Bradley Gelfand, Jayakrishna Ambati. AUPO / RPB Resident and Fellow Research Forum Phoenix, AZ
- January 2015
1st UTMB Sun & Science Eye Research Conference

Galveston, TX

- Human therapeutic monoclonal antibodies inhibit corneal neovascularization via Fc γ RI in a target-independent manner.
 Ana Bastos-Carvalho, Sasha Bogdanovich, Younghee Kim, Reo Yasuma, Takeshi Mizutani, Nagaraj Kerur, Valeria Tarallo, Shengjian Li, Bradley Gelfand, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Extracellular HMGB1 promotes choroidal angiogenesis.
 Younghee Kim, Nagaraj Kerur, Shengjian Li, Ana Bastos-Carvalho, Bradley D Gelfand, William W Hauswirth, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Intravenous immunoglobulin treatment inhibits choroidal and corneal neovascularization via Fc γ RI.
 Reo Yasuma, Sasha Bogdanovich, Younghee Kim, Tetsuhiro Yasuma, Takeshi Mizutani, Ana Bastos-Carvalho, Benjamin Fowler, Shengjian Li, Bradley D Gelfand, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Dual anti-angiogenic activity of Bevacizumab from its IgG1-Fc domain and VEGF neutralization.
 Takeshi Mizutani, Nagaraj Kerur, Shengjian Li, Younghee Kim, Reo Yasuma, Tetsuhiro Yasuma, Ana Bastos-Carvalho, Benjamin Fowler, Bradley Gelfand, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- The Fc fragments of Bevacizumab or IVIG suppress choroidal neovascularization.
 Shengjian Li, Nagaraj Kerur, Sasha Bogdanovich, Reo Yasuma, Younghee Kim, Takeshi Mizutani, Ana Bastos-Carvalho, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Myd88 as a therapeutic target for choroidal neovascularization.
 Nagaraj Kerur, Younghee Kim, Yoshio Hirano, Valeria Tarallo, Ana Bastos-Carvalho, Benjamin Fowler, Tetsuhiro Yasuma, Reo Yasuma, Bradley D Gelfand, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Generic, target-independent suppression of choroidal neovascularization by human IgG1 antibodies via Fc γ RI.
 Tetsuhiro Yasuma, Reo Yasuma, Younghee Kim, Takeshi Mizutani, Nagaraj Kerur, Ana Bastos-Carvalho, Bradley D Gelfand, Jayakrishna Ambati.

May 2014
ARVO
Orlando, FL
- Non-canonical NLRP3 inflammasome activation in Geographic Atrophy.
 Nagaraj Kerur, Younghee Kim, Ana Bastos-Carvalho, Benjamin Fowler, Tetsuhiro Yasuma, Bradley Gelfand, Jayakrishna Ambati.

January 2014
Beckman Initiative
for Macular Research
Irvine, CA
- European Association for Vision and Eye Research

Nice, France, 2013
- European Society of Ophthalmology

Copenhagen, Denmark,
2013
- RNA Silencing Keystone Symposium

Whistler, Canada, 2013
- Portuguese Ophthalmology Society Congress, Keynote Lecture

Lisbon, Portugal, 2012
- FEBS workshop: Cellular and Molecular Mechanisms in Angiogenesis

Capri, Italy, 2012
- PanAmerican Ophthalmology Meeting

Cascais, Portugal, 2011
- New Opportunities Meeting

Amadora, Portugal, 2010
- Portuguese Ophthalmology Society Congress, Retina Session

Porto, Portugal, 2009
- Pediatrics National Meeting

Lisbon, Portugal, 2009
- American Academy of Ophthalmology (2)

Atlanta, GA, 2008

- European Society of Ophthalmology Amsterdam, Netherlands, 2008
- European Vision and Eye Research Portoroz, Slovenia, 2008
- Ocular Angiogenesis Meeting Porto, Portugal, 2008
- National Ocular Inflammation Meeting Viana do Castelo, Portugal, 2008
- Portuguese Ophthalmology Society Congress: Porto, Portugal, 2008
1) Retina Session; 2) Uveitis Session; 3) Neurophthalmology Session
- Santa Maria Hospital Ophthalmology Annual Meeting Cascais, Portugal, 2008
- Portuguese Ophthalmology Society Congress: Porto, Portugal, 2007
1) Retina Session; 2) Anterior Segment Session; 3) Uveitis Session
- European Vision and Eye Research Vilamoura, Portugal, 2006
- International Strabismus Congress Luso, Portugal, 2006
- Portuguese Glaucoma Group Meeting Aveiro, Portugal, 2006
- Santarem Hospital Meeting Santarem, Portugal, 2006
- Portuguese Ophthalmology Society Congress: Vora, Portugal, 2006
1) Retina Session; 2) Uveitis Session; 3) Anterior Segment Session

TEACHING

Coursework, Medical Students

- Neuroanatomy 2007 — 2011
University of Lisbon Medical School, Lisbon, Portugal
- Ophthalmology & Visual Sciences 2007 — 2011
University of Lisbon Medical School, Lisbon, Portugal

Clinical, Medical Students

- Ophthalmology & Visual Sciences 2007 — 2011
University of Lisbon Medical School, Lisbon, Portugal

MENTORSHIP

Student	Year	Degree	Project	Current Position
Franceska Mehmeti	2019	Medical student	Barriers and facilitators of diabetic retinopathy screening implementation	Medical student
Abdallah Mahrous	2014	Pre-doctoral Research	Circulating biomarkers for dry age-related macular degeneration	Retina Fellow
Ana Miranda	2011	MD thesis	Anti-angiogenic agents for ocular neovascularization	Attending physician

INVITED, ELECTED, OR APPOINTED INTRAMURAL SERVICE

- Reviewer, TL1 Study Section 2018 — Present
Center for Clinical and Translational Science, University of Kentucky
- Member, College of Medicine International Committee 2017 — Present
University of Kentucky

INVITED, ELECTED, OR APPOINTED EXTRAMURAL SERVICE

- Reviewer, Training Institute for Dissemination and Implementation Research in Health
National Institutes of Health 2019
- Organizer, Global Ophthalmology Meeting
American Academy of Ophthalmology 2019

REVIEW & REFEREE WORK

- Ad-Hoc Journal Reviewer
Translational Vision Science & Technology 2019 — Present
Investigative Ophthalmology & Visual Science 2012 — Present

OTHER PROFESSIONAL EXPERIENCES

- Implementation Science Technical Assistance Workshop
December 2017
Washington, DC