

BIOGRAPHICAL SKETCH

NAME: Abdelrahman Y. Fouda

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

POSITION TITLE: Teaching Assistant, Faculty of Pharmacy, Cairo University

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Start Date MM/YYYY	Completion MM/YYYY	FIELD OF STUDY
Cairo University, Egypt	B.Pharm	9/2002	5/2007	Pharmacy
Cairo University, Egypt	Researcher	9/2007	7/2011	Clinical Pharmacy
University of Georgia (GA)	PhD	8/2011	4/2015	Stroke
University of Georgia (GA)	Postdoc fellow	5/2015	3/2016	Stroke

A. Personal Statement: Since I began my PhD program at University of Georgia (UGA), I have been interested in the pathophysiology of central nervous system (CNS) ischemia-reperfusion (IR) injury. I joined Dr. Fagan's stroke lab in 2011. During my work as a graduate student, I received a highly competitive university-wide assistantship, and successfully completed and published several research papers and reviews on neurovascular protection through angiotensin system modulation. Working in the stroke lab provided me with the necessary experience and skills to move on to Dr. Caldwell's retinopathy lab. Dr. Caldwell is a renowned leader in the retinopathy field with an outstanding record for training postdocs to become independent investigators. Dr. Caldwell's lab is part of the Vascular Biology Center (VBC) at Augusta University (AU). Since, I joined the retinopathy lab in April 2016, Dr. Caldwell has provided me with full support to develop my own project. I have developed a project focusing on the role of macrophage in retinal IR injury in relation to the enzyme arginase 1 (A1). Based on this project, I have received a prestigious AHA postdoctoral fellowship and published a first author paper documenting and detailing the neuroprotective role of myeloid A1 in retinal IR injury. My K99 application further builds on these findings and extends my research to study histone deacetylase 3, a new unexplored research arm in the retinopathy lab. I plan to investigate the role of HDAC3 in macrophage inflammatory response after IR and its regulation by A1. My hypothesis predicts that myeloid A1 protects against retinal IR injury via suppression of HDAC3. This project will provide me with new conceptual and technical training in retinal neurovascular disease research. In addition the proposed training plan outlines a series of career development activities and workshops – e.g. grant writing, public speaking, lab management, and mentoring students – designed to enhance my ability to be an independent investigator. As a member of the VBC, one of the highly funded departments at AU, I receive additional extensive postdoc training that provides me with excellent background in different vascular biology disciplines through weekly seminars, journal clubs, and metabolic research group meetings as well as meetings with the faculty. Furthermore, our lab is part of the Culver Vision Discovery Institute (VDI) that is comprised of basic and clinical scientists at AU. The VDI has a monthly seminar series and an annual retreat, which further exposes me to various retinopathy research projects. I am extensively involved in the VDI and have served as the leader for the 2018 VDI retreat. My choice of sponsor, research project, and training will give me a solid foundation to reach my goal of studying the mechanisms of blinding ischemic retinal diseases.

- a. Fouda AY**, Xu Z, Shosha E, Lemtalsi T, Chen J, Toque H, Tritz R, Cui X, Stansfield B, Huo Y, Rodriguez PC, Smith SB, Caldwell RW, Narayanan SP, and Caldwell RB. Arginase 1 promotes retinal neurovascular protection from ischemia through suppression of macrophage inflammatory responses. **Cell Death & Disease** 2018 Sep 25;9(10):1001.
- b. Xu Z***, **Fouda AY***, Lemtalsi T, Shosha E, Patel C, Caldwell RW, Narayanan SP, and Caldwell RB. Retinal neuroprotection from optic nerve trauma by deletion of arginase 2. **Frontiers in Neuroscience** – **under review**. (*equal contribution)

- c. Shosha E, Xu Z, Narayanan SP, Lemtalsi T, **Fouda AY**, Rojas M, Xing J, Fulton D, Caldwell RW, Caldwell RB. Mechanisms of Diabetes-Induced Endothelial Cell Senescence: Role of Arginase 1. **International Journal of Molecular Sciences** 2018 Apr 17;19(4).
- d. Pichavaram P, Palani C, Patel C, Xu Z, Shosha E, **Fouda AY**, Caldwell RB, Narayanan SP. Targeting polyamine oxidase to prevent excitotoxicity-induced retinal neurodegeneration. **Frontiers in Neuroscience** – under review.

B. Positions and Honors

Positions and Employment:

5/2007 - 9/2007	Pharmacist, Retail Pharmacy
9/2007 - 7/2011	Teaching Assistant, School of Pharmacy, Cairo University
5/2015 - 3/2016	Postdoctoral fellow, University of Georgia (UGA)
8/2011 - present	Vascular biologist, Veterans Affairs (VA) Medical Center
4/2016 - present	Postdoctoral fellow, Augusta University (AU)

Other Experience and Professional Memberships:

9/2007 - 7/2011	Member of Performance Appraisal and Quality Assurance Unit (PAQU), and bioequivalence studies team in the Centre of Applied Research & Advanced Studies (CARAS) School of Pharmacy, Cairo University.
2012 - 2014	Member of the American College of Clinical Pharmacy (ACCP).
8/2011 - 5/2015	Member of the MACH clinical trial team (completed) - clinicaltrials.gov ID: NCT01805895, I-SPOT clinical trial team (completed) - clinicaltrials.gov ID: NCT01811550, COAG clinical trial team (completed) - clinicaltrials.gov ID: NCT00839657, 'ProNGF in diabetic retinopathy' clinical trial team (completed).
9/2007 - present	Teaching undergraduate and graduate therapeutics courses in Cairo University, University of Georgia and Augusta University.
2012 - present	Member of the American Heart Association (AHA).
5/2015 - present	Serving as reviewer for journals: Neuropharmacology, Molecular Neurobiology, Neuroscience, Cellular Physiology and Biochemistry, Therapeutic Advances in Cardiovascular Disease, Plos One and Scientific Reports. Reviewing abstracts for the American Heart Association (AHA) scientific sessions 2016. Serving as guest editor for Stroke Research and Treatment, and the Hypertension journal.
11/2016 - present	Member -Association for Research in Vision and Ophthalmology (ARVO).
12/2016 - present	Leader -Vision Discovery Institute (VDI) retreat organizing committee.
3/2017 - present	Member -Veterans Affairs (VA) research week organizing committee.
12/2017 - present	Member, American Society for Pharmacology and Exp. Therap. (ASPET)

Academic and Professional Honors:

5/2007	Summa Cum Laude - Honor graduate , B.Pharm (ranked FIRST on class of ~1500 students), Pharmacy School, Cairo University.
5/2010	Best TA Award, Clinical Pharmacy Department, Cairo University.
8/2011 - 5/2015	Two-year University-Wide Graduate School Assistantship , UGA (awarded by the graduate school to highly qualified students in a university-wide competition) followed by Two-year Graduate Assistantship from the UGA Pharmacy school
9/2013 - 5/2017	Selected oral presentations, Southern Translational Education and Research (STaR) Conference 2013, International Stroke Conference (ISC) 2014 and 2015, Graduate Research Day (GRD) 2017, Vision Discovery Institute (VDI) retreat 2017, Veterans Affairs (VA) research day 2017
9/2013	Travel Award , Southern Translational Education and Research (STaR) Conference.
3/2014	Award of Excellence in Graduate Research -Graduate Research Day at AU.

- 4/2014 Schematic diagram in my review article published in the Journal of Cerebral Blood Flow and Metabolism was selected as journal cover page.
- 4/2014 **Best poster award**, Southeast Neuroscience Conference.
- 9/2014 UGA Graduate school travel award to attend the High Blood Pressure Research (HBPR) meeting. San Francisco, CA. September 2014.
- 2/2015 International Stroke Conference Junior Investigator **Travel Award**.
- 5/2015 **Best poster** – People choice award, Charlie Norwood Veteran Affairs Medical Centre (CNVAMC) research week, GA. May 2015.
- 9/2015 **Travel award** for the best abstracts to the STaR conference 2015 in Athens, GA.
- 11/2015 ISC 2015 abstract was selected among top 10% abstracts in AHA specialty meetings and represented in the Scientific Sessions 2015 under 'best of AHA'.
- 12/2016 Abstract selected for a Research Snapshot Presentation in the Society of Critical Care Medicine (SCCM) meeting, Jan 2017
- 5/2017 Earning a "Communicator" ribbon at the ARVO 2017 meeting based on abstract.
- 5/2017 **Best poster award**, Veterans Affairs (VA) research day 2017, GA.
- 4/2018 Division for Neuropharmacology Postdoctoral Scientist Award Finalist - EB meeting.
- 4/2018 **ASPET Travel award** to attend the Experimental Biology (EB) meeting.
- 7/2018 American Heart Association (AHA) **postdoctoral fellowship**.

C. Contributions to Science

1-Retina research: In addition to my main project outlined in the personal statement, I have been actively involved in other retina related projects as well. I have worked on a traumatic optic neuropathy study as part of Dr. Caldwell's VA merit project using the mouse optic nerve crush model and I am a co-first author on a paper from this work that is currently under review. I have also been exposed to various diabetic retinopathy models (STZ and Akita) in studies from Dr. Caldwell's R01 project and this resulted in a co-author manuscript in the Int J Mol Sci. 2018. Furthermore, I am currently drafting a manuscript from a study examining the role of A1 in the oxygen induced retinopathy (OIR) model. In collaboration with Dr. Priya Narayanan at the VDI, I also participated in studies using the N-Methyl-D-aspartate (NMDA) retina excitotoxicity model as well as experimental autoimmune encephalomyelitis (EAE) which models multiple sclerosis induced optic neuritis.

- a. Xu Z*, **Fouda AY***, Lemtalsi T, Shosha E, Patel C, Caldwell RW, Narayanan SP, and Caldwell RB. Retinal neuroprotection from optic nerve trauma by deletion of arginase 2. **Frontiers in Neuroscience** – **under review. (*equal contribution)**
- b. Shosha E, Xu Z, Narayanan SP, Lemtalsi T, **Fouda AY**, Rojas M, Xing J, Fulton D, Caldwell RW, Caldwell RB. Mechanisms of Diabetes-Induced Endothelial Cell Senescence: Role of Arginase 1. **International Journal of Molecular Sciences** 2018 Apr 17;19(4).
- c. Pichavaram P, Palani C, Patel C, Xu Z, Shosha E, **Fouda AY**, Caldwell RB, Narayanan SP. Targeting polyamine oxidase to prevent excitotoxicity-induced retinal neurodegeneration. **Frontiers in Neuroscience** – **under review.**
- d. Palani C, Xu Z, Fouda AY, Saul A, Smith S, Caldwell RB, Narayanan SP. Role of arginase in multiple sclerosis mediated retinal neuronal injury. Presented as an oral talk and a poster presentation in the VDI retreat 2018. **Manuscript is currently in preparation.**

2-Stroke research: During my PhD, I studied neurovascular protection after ischemic stroke through angiotensin system modulation under the mentorship of Dr. Susan Fagan. Using the angiotensin type I receptor blocker candesartan (FDA approved drug) and the angiotensin type II receptor agonist, compound 21 (C21 – now in phase I clinical trials), I generated several manuscripts. My manuscripts in the Journal of Hypertension (2015) and EJP (2017) proved the neurovascular protective role of C21 and highlighted the underlying mechanisms involved. In addition, my work with candesartan (Mol Neurobiol. 2017) elucidated the mechanism involved in its role in behavioral recovery after stroke. I am also the leading author on a clinical trial examining minocycline pharmacokinetics in stroke patients (Stroke 2017).

- a. **Fouda AY**, Newsome AS, Switzer J, Ergul A, Edwards DJ, Hess DC, Wenbo Zhi, Waller J, Spellacy S, and Fagan SC. Minocycline in Acute Cerebral Hemorrhage: An Early Phase Randomized Trial. **Stroke** 2017,

Oct;48(10):2885-2887.

- b. **Fouda AY**, Alhusban A, Ishrat T, Pillai B, Eldahshan W, Waller JL, Ergul A, Fagan SC. Brain derived neurotrophic factor knockdown blocks the angiogenic and protective effects of angiotensin modulation after experimental stroke. **Molecular Neurobiology** 2017 Jan;54(1):661-670.
- c. **Fouda AY**, Pillai B, Dhandapani K, Ergul A, Fagan SC. Role of interleukin 10 in compound 21 mediated functional recovery after stroke. **European Journal of Pharmacology** 2017 Mar 15;799:128-134.
- d. **Fouda AY**, Kozak A, Alhusban A, Switzer JA, Fagan SC. Anti-inflammatory IL-10 is upregulated in both hemispheres after experimental ischemic stroke: Hypertension blunts the response. **Experimental and Translational Stroke Medicine** 2013 Nov 13;5(1):12.

3-Review articles: I have been active in preparing and writing comprehensive review articles about neurovascular protection after stroke. I was involved in several reviews with Drs. Susan Fagan and Adviy Ergul, that were published in highly reputable journals such as (JCBFM 2014), (Brain Res. 2015), and (Transl Stroke Res. 2016). Before my graduation, I was lead author of a comprehensive review article about angiotensin system modulation in stroke and retinopathy that was published in the high impact 'Clinical Science' journal (2016). This review was a basis for my transition from the stroke to the retinopathy field. Selected review articles:

- a. **Fouda AY**, Artham S, El-Remessy A, Fagan SC. Renin angiotensin system as a potential therapeutic target in stroke and retinopathy: Experimental and clinical evidence. **Clinical Science** 2016 Feb;130(4):221-38.
- b. Ergul A, Hafez S, **Fouda AY**, Fagan SC. Impact of comorbidities on acute injury and recovery in preclinical stroke research: Focus on hypertension & diabetes. **Translational Stroke Research** 2016 Aug;7(4):248-60.
- c. Ergul A, Valenzuela JP, **Fouda AY** and Fagan SC, Cellular Connections, Microenvironment and Brain Angiogenesis in Diabetes: Lost Communication Signals in the Post-stroke Period. **Brain Research** 2015 Mar 3. pii: S0006-8993(15)00165-1.
- d. Ergul A., Abdelsaid M, **Fouda AY**, and Fagan SC. Cerebral neovascularization in diabetes: Implications for stroke recovery and beyond. **Journal of Cerebral Blood Flow and Metabolism** 2014 Apr;34(4):553-63. doi: 10.1038/jcbfm.2014.18. (Applicant has helped in designing schematic diagram in the review that was later accepted as journal cover page).

For a complete list of my publications:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/10muHUuMGBY5kM/bibliography/51935752/public/?sort=date&direction=ascending>

4-Oral presentations (selected): During my graduate and postdoc training, I have given several oral talks in conferences in addition to departmental seminars and journal clubs. Delivering oral talks have greatly added to my communication skills. Selected oral presentations:

- a. **Fouda AY**, Xu Z, Shosha E, Chen J, Cui R, Smith SB, Huo Y, Rodriguez P, Caldwell RW, Narayanan SP, Caldwell RB. Myeloid Arginase 1 Protects Against Retinal Ischemia-Reperfusion Injury. **Experimental Biology**, San Diego, CA, April 2018. (This abstract received a travel award and was selected for oral presentation and competition for the Postdoctoral Finalist Award from the Division for Neuropharmacology.
- b. **Fouda AY**, Ergul A, and Fagan SC. The angiotensin type 2-receptor agonist, compound 21, provides neuroprotection after ischemia reperfusion injury through interleukin 10 upregulation'. **International Stroke Conference (ISC)**, Nashville, TN, 2015 (abstract received a travel award and was selected among the best top 10% – was re-presented in the Scientific Sessions 2015 under the 'best of AHA specialty' category).
- c. Alhusban A, **Fouda AY (presenter)**, Pillai B, Ergul A, Fagan SC. BDNF knockdown abrogates AT1 blockade-induced improvement in stroke outcome. **International Stroke Conference (ISC)**, San Diego, CA. Feb 2014.
- d. **Fouda AY**, Alhusban A, Pillai B, Fagan SC. Compound 21 mitigates inflammation and improves long term recovery after ischemic stroke. Southern Translational Education & Research (**STaR**) Conference 2013.

5-Poster presentations (selected): During my PhD and postdoc career, I have presented my work in several regional and national conferences which helped me network and develop communication skills. I have presented in national and international meetings such as the American College of Clinical Pharmacy (ACCP) annual meeting 2012, International Stroke Conferences 2014, 2015, and 2016, High blood pressure research (HBPR) meeting 2014, the Association for Research in Vision and Ophthalmology (ARVO) meeting 2017, and Experimental Biology (EB) 2018. In addition I have been actively participating in local and regional conferences such as Southern Translational Education and Research (STaR) conference, Vision Discovery Institute (VDI) retreat, the Southeast Neuroscience Conference, Graduate Research Day at Augusta University and Charlie Norwood Veteran Affairs Medical Centre (CNVAMC) research week. Selected poster presentations:

- a. **Fouda AY**, Xu Z, Shosha E, Caldwell W, Narayanan SP, Caldwell RB. Protective Role of Arginase 1 in Retinal Ischemia Reperfusion Injury. Association for Research in Vision and Ophthalmology (**ARVO**) meeting, Baltimore, MD, May 2017. Received communicator ribbon.
- b. **Fouda AY**, Ishrat T, Ahmed H, Pillai B, Artham S, and Fagan SC. Involvement of the contralesional angiotensin type 2 receptor in compound 21 mediated functional recovery after stroke. Received the People Choice Award at Charlie Norwood Veteran Affairs Medical Centre (CNVAMC) research week, 2015. STaR conference, Athens, GA, September 2015.
- c. **Fouda AY**, Alhusban A, Pillai B, Ishrat T, and Fagan SC. Compound 21 is proangiogenic in the brain and results in sustained recovery after ischemic stroke. Best Poster Presentation at the Southeast Neuroscience Conference. April 19, 2014.
- d. **Fouda AY**, Soliman S, Pillai B, Ergul A, Fagan SC. Impaired response to post-stroke candesartan treatment in a model of type 2 diabetes: relationship to angiotensin receptor expression. Best Poster Presentation at the Graduate research day, Georgia Regents University, Augusta, GA. March 2014

D. Research Support:

Ongoing Research Support: 18POST34060036 _ Fouda AY (PI) 07/01/2018 – 06/31/2020

American Heart Association (AHA) postdoctoral fellowship

Completed support: University-Wide Graduate School Assistantship, UGA 8/2011 - 5/2013

Academic records:

Year	Cairo University Courses	Grade	Year	University of Georgia Courses	Grade
2003	General Pharmacognosy I & Medicinal Plants	Excellent	2011	Biochemistry & Gene Regulation	A
2003	Pharmaceutics I (including History of Pharmacy)	Excellent	2011	Molecular Cell Biology	A
2004	Principles of Physiology, Anatomy & Histology	Excellent	2011	Introduction To Research	S
2004	General Pharmacognosy II	Excellent	2011	Advanced Therapeutics I	A
2004	Pharmaceutics II	Excellent	2011	Experimental Therapeutics	A
2005	Pharmaceutical Microbiology	Excellent	2012	Biomedical Statistics	A
2005	Pharmacy Administration	Excellent	2012	Doctoral Research	S
2005	Phytochemistry	Excellent	2012	Advanced Therapeutics II	A
2005	Pharmaceutical Chemistry	Excellent	2012	Research Ethics	A
2006	Biochemistry	Excellent	2012	Clinical Seminar	S
2006	Pharmaceutics III (including Pharmacy Legislations)	Excellent	2012	Doctoral Research	S
2006	Pharmacology	Excellent	2012	Clinical Seminar	S
2006	Public Health & Principles of Pathology & Parasitology	Excellent	2012	Grantsmanship	A
2006	Pharmaceutical Chemistry	Excellent	2012	Methods In Experimental Therapeutics	A
2007	Pharmaceutics IV	Excellent	2012	Doctoral Research	S
2007	Industrial Pharmacy	Excellent			
2007	Applied Pharmacognosy	Excellent			
2007	Biological Standardization of Drugs & Biostatistics	Excellent			
2007	Toxicology, Forensic Chemistry & First Aid	Excellent			

Grading System: A or Excellent; 90-100%, B or Very good; 80-89%, C or Good; 70-79%, D or Pass; 60-69%, F or Fail; <60%. S; Satisfactory (for non-graded courses)