

**Mohamed Fouda**, PhD, MSc in Pharmacology, BSc in Pharmacy  
Lecturer at Pharmacology and Toxicology department, Faculty of Pharmacy, Alexandria University, Egypt  
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**Research interests (*in-vivo* and *in-vitro* cardiovascular, neuropharmacology and electrophysiology)**

- Understanding the molecular and neuronal mechanisms of cardiovascular anomalies.
- *In-vivo* studies on nicotine-evoked cardiac dysfunctions (Master's and PhD)
- Sex differences in neuronal adenosine receptors signaling (Master's and PhD)
- *In-vitro* molecular mechanisms of the neuroprotective action of moxonidine in diabetic rats (My first postdoctoral training)
- Electrophysiological patch clamp methodological approaches and molecular biology techniques to study effects of cannabinoids on sodium ion channels (My current postdoctoral training).

**Career History**

- 2018 November till now: Postdoctoral fellow at Simon Fraser University, BC, Canada.
- 2018 February-November: Postdoctoral fellow at Brody School of medicine, East Carolina University, USA.
- 2016 May- November: Visiting scholar at Brody School of medicine, East Carolina University, USA funded from the Egyptian government.
- 2014 till now: Lecturer on a leave of absence, Dept. of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt.
- 2007- teaching assistant, Dept. of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt.
- 2007-till now: Licensed community pharmacist in Egypt

**Research techniques:**

- Intravascular cannulation and measurement of blood pressure parameters in conscious animals (rats)
- Intracisternal cannulation in rats (*in-vivo* brain injections)
- Isolated perfused kidney technique
- Electrophysiological patch clamp technique
- Cell culturing techniques and human pluripotent stem cell-derived cardiomyocytes
- Biochemical assays
- Isolation, slicing and/or homogenization of different tissues isolated from rats
- Ovariectomy of female rats

- Western blotting
- Immunohistochemistry
- Polymerase chain reaction
- Cloning
- ELISA

### **Qualifications**

- 2014 **PhD.**, Pharmacology, entitled "Role of estrogenic pathways of nitric oxide synthase and heme oxygenase in the hemodynamic effects of nicotine in female rats". Department of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt.
- 2010 **Master's degree.**, Pharmacology, entitled "Estrogen modulation of the adverse Cardiovascular effects of nicotine in female rats". Department of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt.
- 2007 **Bachelor's degree.**, Pharmacy, with the grade of Distinction Honor, Faculty of Pharmacy, Alexandria University, Egypt.

### **Pharmacology graduate student mentorship**

#### **Master's degrees (2)**

- Sherouk Sherif (August 2017), Faculty of Pharmacy, Pharos University.
- Mohamed Abdalla Lakany (August 2015), Faculty of Pharmacy, Alexandria University

### **Training:**

- 1- Vancouver molecular biology workshop (February 18th-22nd, 2019) at University of British Columbia

This workshop included hands-on training on different techniques used in the molecular manipulation of DNA, RNA and protein such as:

- western blotting
- Cloning
- qPCR
- ELISA
- Next generation sequencing analysis

- 2- MITACS elevate training, Canada:

- Project leadership
- Partner organization business case
- Career management
- Building professional relationships

- 3- Flow cytometry workshop April 2018, East Carolina University, NC, USA.

4- Industrial pharmaceutical training in “Pharco pharmaceuticals”, Egypt, 2006.

### **Awards**

- MITACS Elevate postdoctoral fellowship (IT1449-IT1450) in collaboration with “Akseera pharmaceutical corp.” entitled “Interaction between cannabinoid drugs and sodium channels in diabetes/high glucose induced oxidative stress, neuroinflammation, and neurotoxicity” (September 2019-now).
- Visiting scholarship at Brody School of medicine, East Carolina University, United States of America funded from the Egyptian government.
- Best oral presentation award from Faculty of Pharmacy, Alexandria University in May 2013.

### **Funds**

- Postdoctoral researcher in grant focusing on the effects of cannabinoids on voltage-gated sodium channels. The funding comes from the industrial partner, Agrima Botanicals company (November 2018- till September 2019).
- Member of an EU-funded consortium funded under the ERSAMUS+KA2 program (contract number: 561915-EPP-2015-EG-EPPKA2-CBHE-JP). In this project, Newcastle University together with several European partners are co-operating with Cairo University in developing a new diploma in clinical toxicology (2015-2018).
- Member in project supported by the Science and Technology Development Fund, Egypt (STDF Grant No. 14895) to study the gonadal hormone modulation of the cardiovascular effects of endotoxemia (2015-2018).

### **Teaching:**

- Pharmacology and Toxicology, undergraduate pharmacy students, Alexandria University, Egypt.
- Biochemistry and Bioassay, undergraduate pharmacy students, Alexandria University, Egypt.
- Pharmacology I, Clinical program undergraduate pharmacy students, Alexandria University, Egypt.
- Drug interactions, Clinical program undergraduate pharmacy students, Alexandria University, Egypt.
- Drug information, Clinical program undergraduate pharmacy students, Alexandria University, Egypt.
- Clinical nutrition, Clinical program undergraduate pharmacy students, Alexandria University, Egypt.

## Peer-reviewed research papers (21)

1. **Fouda MA** and Abdel-Rahman AA (2021): Role of phospholipase D in the deleterious cardiac and neurological effects of posttraumatic stress disorder in rats. In preparation.
2. **Fouda MA**, El-Yazbi AF and El-Mas MM (2021): Differential modulation by adenosine A1 and A3 receptors of acute endotoxemia-induced hemodynamics, cardiac autonomic impairment, and oxidative damage. In Preparation.
3. Elzokm SS, **Fouda MA**, Abdel Moneim RA, El-Mas MM (2021): Distinct effects of calcineurin dependent and independent immunosuppressants on endotoxemia-induced nephrotoxicity In Rats: role of androgens. *Clin Exp Pharmacol Physiol*. doi: 10.1111/1440-1681.13526.
4. **Fouda MA**, Ruben PC (2021): Protein Kinases Mediate Anti-Inflammatory Effects of Cannabidiol and Estradiol Against High Glucose in Cardiac Sodium Channels. *Front Pharmacol*.12:668657. doi: 10.3389/fphar.2021.668657. eCollection 2021.
5. Ghovanloo MR, Choudhury K, Bandaru TS, **Fouda MA**, Rayani k, Rusinova R, Phaterpekar T, Nelkenbrecher K, Watkins AR, Poburko D, Thewalt J, Andersen OS, Delemotte L, Goodchild SJ, Ruben PC (2021): Cannabidiol inhibits the skeletal muscle Nav1.4 by blocking its pore and by altering membrane elasticity. *J Gen Physiol*. 3;153(5): e202012701. doi: 10.1085/jgp.202012701.
6. El-Lakany MA, **Fouda MA**, El-Gowell HM and El-Mas MM (2020): Nicotine uncovers endotoxic-like cardiovascular manifestations in female rats: estrogen and nitric oxide dependency. *Toxicol lett*. 335:28-36. doi: 0.1016/j.toxlet.2020.10.004.
7. **Fouda MA**, Ghovanloo MR and Ruben PC (2020): Cannabidiol Protects Against High Glucose-Induced Oxidative Stress and Cytotoxicity in Cardiac Voltage-Gated Sodium Channels. *Br J Pharmacol*;177(13):2932-2946. doi: 10.1111/bph.15020.
8. **Fouda MA**, Leffler K and Abdel-Rahman AA (2020): Estrogen-dependent Hypersensitivity to Diabetes-Evoked Cardiac Autonomic Dysregulation: Role of Hypothalamic Neuroinflammation. *Life Sci*. 1; 250:117598. doi: 10.1016/j.lfs.2020.117598.
9. El-Lakany MA, **Fouda MA**, El-Gowell HM and El-Mas MM (2020): Ovariectomy Provokes Inflammatory and Cardiovascular Effects of Endotoxemia in Rats: Dissimilar Benefits of Hormonal Supplements. *Toxicol Appl Pharmacol*.15;393:114928. doi: 0.1016/j.taap.2020.114928.
10. Sallam MY, El-Gowilly SM, **Fouda MA**, Abd-Alhaseeb MM, El-Mas MM (2019): Brainstem Cholinergic Pathways Diminish Cardiovascular and Neuroinflammatory Actions of Endotoxemia in Rats: Role of NFκB/α7/α4β2AChRs Signaling. *Neuropharmacology*. 157:107683. doi: 10.1016/j.neuropharm.2019.107683.
11. Elkhatib ME, Mroueh AF, Rafeh RW, Fouad H, Saad EI, **Fouda MA**, Elgaddar O, Issa K, Eid AH, Eid AA, Abd-Elrahman KS, and El-Yazbi AF (2019): Anti-diabetic drugs ameliorate perivascular adipose inflammation and vascular dysfunction in a model of non-

obese prediabetic metabolic challenge. *Transl Res.* 214:121-143. doi: 10.1016/j.trsl.2019.07.009.

12. El-lakany, **Fouda MA**, El-Gowell HM, El-Gowilly SM and El-Mas MM (2018): Gonadal hormone receptors underlie the resistance of female rats to cardiovascular complications of endotoxemia. *Eur J Pharmacol.* 823:41-48. doi: 10.1016/j.ejphar.2018.01.051.
13. **Fouda MA**, El-Sayed SS and Abdel-Rahman AA (2018): Restoration of rostral ventrolateral medulla cystathionine- $\gamma$  lyase activity underlies moxonidine-evoked neuroprotection and sympathoinhibition in diabetic rats. *J Pharmacol Exp Ther.* 364(2):170-178. doi: 10.1124/jpet.117.243865.
14. **Fouda MA**, El-Gowell HM, El-Gowilly SM and El-Mas MM (2018): Hemin blunts the depressant effect of chronic nicotine on reflex tachycardia in female rats via activation of central NOS/PI3K pathway. *Pharmacol Rep.* 70(3):455-462. doi: 10.1016.
15. **Fouda MA** and Abdel-Rahman AA (2017): Endothelin confers protection against high glucose-induced neurotoxicity via alleviation of oxidative stress. *J Pharmacol Exp Ther.* 361(1):130. doi: 10.1124/jpet.116.238659.
16. **Fouda MA**, El-Gowell HM, El-Gowilly SM and El-Mas MM (2015): The estrogen-dependent baroreflex dysfunction caused by nicotine in female rats is mediated via NOS/HO inhibition: Role of sGC/PI3K/MAPK<sub>ERK</sub>. *Toxicol Appl Pharmacol.* 15;289:466-473. doi: 10.1016/j.taap.2015.10.014.
17. Allam AN, Komeil IA, **Fouda MA** and Abdallah OY (2015): Preparation, characterization and in vivo evaluation of curcumin self-nano phospholipid dispersion as an approach to enhance oral bioavailability. *Int J Pharm.* 489:117-23. doi: 10.1016/j.ijpharm.2015.04.067.
18. **Fouda MA**, El-Gowell HM, El-Gowilly SM, Rashed L and El-Mas MM (2014): Impairment of nitric oxide synthase but not heme oxygenase accounts for baroreflex dysfunction caused by chronic nicotine in female rats. *PLoS One.* 28;9(5):e98681. doi: 10.1371/journal.pone.0098681.
19. El-Mas MM, El-Gowell HM, El-Gowilly SM, **Fouda MA** and Helmy MM (2012): Estrogen provokes the depressant effect of chronic nicotine on vagally mediated reflex chronotropism in female rats. *J Pharmacol Exp Ther.* 342(2):568- 575. doi: 10.1124/jpet.112.191940.
20. El-Mas MM, El-Gowilly SM, **Fouda MA** and Saad EI (2012): Role of adenosine A2A receptor signaling in the nicotine-evoked attenuation of reflex cardiac sympathetic control. *Toxicol Appl Pharmacol.* 1;254(3):229-37. doi: 10.1016/j.taap.2011.04.014.
21. El-Mas MM, **Fouda MA**, El-Gowilly SM and Saad EI (2011): Central estrogenic pathways protect against the depressant action of acute nicotine on reflex tachycardia in female rats. *Toxicol Appl Pharmacol.* Toxicol Appl Pharmacol. 1: 258:410-417. doi: 10.1016/j.taap.2011.12.011.

#### **Published Abstracts (14)**

1. **Fouda MA**, Ghovanloo MR and Ruben PC (2020): Protective Effect of Cannabidiol Against Oxidative Stress and Cytotoxicity Evoked by High Glucose in Cardiac Voltage-Gated Sodium Channels. *Biophysical journal*. doi.org/10.1016/j.bpj.2019.11.3138
2. Elzokm SS, **Fouda MA**, Abdel Moneim RA, El-Mas MM (2020): Directionally Opposite Effects Of Cyclosporine And Sirolimus On Endotoxic Nephrotoxicity In Rats. *FASEB J*. doi.org/10.1096/fasebj.2020.34.s1.01773.
3. Elzokm SS, **Fouda MA**, Abdel Moneim RA, El-Mas MM (2020): Androgen-Dependent Provocation by Tacrolimus of Nephrotoxic and Inflammatory Consequences of Endotoxemia in Rats. *FASEB J*. doi.org/10.1096/fasebj.2020.34.s1.01855.
4. Elzokm SS, El-Deeb NM, Abdel Moneim RA, **Fouda MA** and EL-Mas MM (2020): Endotoxic hepatotoxicity in rats is exacerbated by tacrolimus and diminished by cyclosporine or sirolimus: modulation by androgenic hormones. *FASEB J*. doi.org/10.1096/fasebj.2020.34.s1.04349.
5. El-Lakany M, El-Gowell H, **Fouda MA**, El-Gowilly S and El-Mas M: Gonadal hormone receptors underlie the resistance of female rats to cardiovascular complications of endotoxemia. *FASEB J*. 2017. vol. 31 no. 1 Supplement 848.4.
6. El-Yazbi A, El-Khatib M, **Fouda MA**, Sleiman F, Saad E, Fouad H and Eid A: High-calorie diet induces vascular and hemodynamic abnormalities in absence of change in blood glucose or insulin levels: modulation by oral anti-hyperglycemic drugs. *FASEB J*. 2017. vol. 31 no. 1 Supplement 1068.3.
7. **Fouda MA**, El-Gowell HM, El-Gowilly SM and El-Mas MM: Hemin blunts the depressant effect of chronic nicotine on reflex tachycardia in female rats via activation of central NOS/PI3K pathway. *British pharmacology society conference*. 2015. London. U.K.
8. El-Mas MM, El-Gowell HM, **Fouda MA**, and El-gowilly SM: The interplay between heme oxygenase and nitric oxide synthase and downstream PI3K/sGC/ERK signaling ameliorates the estrogen-dependant depressant effect of chronic nicotine on reflex bradycardia. *FASEB J*.2014. 28:837.2.
9. El-Mas MM, El-Gowell HM, **Fouda MA**, and El-gowilly SM: Modulation of the baroreflex depressant effect of chronic nicotine in female rats by nitric oxide synthase and heme oxygenase. *FASEB J*. 2013. 27:654.5.
10. El-Mas MM, El-Gowell HM, **Fouda MA**, and El-gowilly SM: Inhibition of the estrogen-mediated cardiac vagal control accounts for the baroreflex depressant effect of chronic nicotine in female rats. *FASEB J* 2012, 26:1124.9

11. El-Mas MM, El-Gowellli HM, **Fouda MA**, Helmy MM. Dose Dependency and autonomic modulation of the depressant effect of chronic nicotine on reflex chronotropic responses in female rats. FASEB J 2011, 25, 1084.1.
12. El-Mas MM, El-gowilly SM, **Fouda MA**, Saad EI. Central adenosine receptors differentially contribute to the nicotine-induced attenuation of reflex tachycardic responses to baroreceptor unloading. FASEB J 2011, 25, 1084.3.
13. El-Mas MM, El-gowilly SM, **Fouda MA**, and Saad EI. Acute nicotine attenuates reflex tachycardia in male rats via inhibition of baroreceptor- mediated cardiac sympathetic control. FASEB J 2010, 24, 961.2.
14. El-Mas MM, El-gowilly SM, **Fouda MA**, and Saad EI. Estrogen Protects Female Rats Against the Nicotine-Induced Attenuation Of Reflex Tachycardia: Role Of Central Estrogen Receptors. FASEB J 2010, 24, 961.3.

#### **Research Talks:**

Speaker at “**Cannabis 2020**” conference: Cannabidiol mitigates high glucose-induced deleterious effects in cardiac sodium channels. [Online Meeting on Cannabis and Cannabinoids \(scientificprism.com\)](https://www.scientificprism.com/online-meeting-on-cannabis-and-cannabinoids)

#### **Journal Reviewer**

Reviewed manuscripts submitted to journals such as scientific report Journal (Impact factor 2018, 4.2), Life sciences (Impact factor 2018, 3.5), review editor at Frontiers in pharmacology (Impact factor 2018, 4.2) (Cardiovascular and Smooth Muscle Pharmacology).

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