

## **Ms. Eman (*Iman*) Abdelaziz Mohamed**

PhD Candidate, Australian Regenerative Medicine Institute, Monash University  
MSc. Pharm, BSc. Pharm

Eman was the first student to graduate from the Master of Science in Pharmacy (MSc. Pharm) program by the College of Pharmacy (CPH), Qatar University (QU) in Spring of 2014. Her thesis was described as being in the 10% of all of the MSc level thesis projects evaluated by University of Ottawa's Professor Dr Balwant Tauna, an International cardiovascular research expert on her graduate research committee. Under the supervision of Dr. Fatima Mraiche, Associate Professor and Chair of Strategic Planning Committee in the Department of Pharmaceutical Sciences (CPH), Eman's research focused on the cellular interplay between the Na<sup>+</sup>/H<sup>+</sup> Exchanger 1 (a heart specific protein) and Osteopontin (a matricellular protein of the extracellular matrix) in an in vitro model of Cardiac Hypertrophy. With the support of CPH and QU, Eman was always on the frontiers of disseminating her research findings locally, regionally and internationally. As the 1st place winner of the Graduate Studies Awards for Outstanding Scholarship and Research in first Grad Faculty Forum hosted by QU's Office of Graduate Research, Eman received funding to attend and present her findings in the International Society for Heart Research XXI World Congress in San Diego, California in 2013. Eman was also awarded the Ebn Sina Medical Scholarship in 2011 and was hired as the first Graduate Teaching Assistant in the CPH throughout her candidacy in the program. She is currently a PhD candidate with the Australian Regenerative Medicine Institute (ARMI), a thriving international hub for cutting-edge research in Monash University, Melbourne, Australia.

Following her graduation, Eman continued her contribution to CPH, where she was part of the team working on the Continuous Professional Pharmacy Development program's application and successful grant of international accreditation by the American Council of Pharmacy Education. Shortly after, she was appointed as a Research Associate in Qatar Cardiovascular Research Center, which operated under Qatar Foundation, and the vision of renowned Cardiothoracic Surgeon Sir. Professor Magdi Yacoub. Eman's research focused on characterizing and validating the role of MYBPC3 variants in hypertrophic cardiomyopathy, an inherited form of cardiovascular disease, using the zebrafish model for the first time in Qatar. The findings of this study were recently published in the Journal of Cellular Physiology.

With teaching being one of her lifelong passions, Eman made the transition to Academia in the Fall of 2015, when she took on the position of Intermediate Instructor in Nobel Laureate Prof. Ahmed Zewail's City of Science and Technology, in Egypt. This was a very rewarding time for Eman as she was able to utilize her diverse background in Pharmacy, Pharmacology and Biomedical Sciences and apply her skills in the instruction of several courses ranging from foundation level Biology, to advanced level Evolutionary Biology, Epigenetics as well as Human Anatomy. Nevertheless, her passion for Cardiovascular Diseases was a constant driving force for her and she continued her study of the heart with both the Center of Excellence for Stem cells and Regenerative Medicine (CESC), and Egypt's National Heart Institute (NHI). In 2017, Eman published a Medical Hypotheses examining the alterations

taking place in the lever systems acting on the heart in Dilated Cardiomyopathy, one of the most common forms of non-ischemic heart diseases, occurring in the Egyptian population.

In 2019, Eman relocated to Kuwait, but continued her collaborations with the CESC and NHI through an initiative aimed at reviewing the embryological development of the heart and cardiogenesis. Reflecting back on her decision to focus her time and efforts to studying heart development, Eman says: *"I have always been fascinated by the heart's ability to carry out more physical work than any other muscle over a lifetime, yet its regenerative ability continues to diminish over time. It baffled me that when it came to the therapeutic options for cardiovascular disease and in spite of the advances that have been made over the last few decades, there continued to be many gaps in our knowledge heart development. The idea that this could be impeding the successful application of stem cell therapies in congenital and adult heart disease consumed me"*. As 2019 came to an end, Eman successfully published a review article highlighting the role of Wnt Signaling during heart development, its implication in CHD as well as the current drawbacks and potential of stem cell therapy in CHD. Eman also published a review article with her colleagues from QU and INSERM (France) underlining the novel roles for Osteopontin in the development of Cardiac Fibrosis and its potential as a therapeutic target. Inspired by the leading women in science and technology that she had encountered and learned from over the years, Eman took the decision to pursue her PhD degree from a world class University and Research Institution.

Early in 2020, Eman was accepted into the PhD Program offered by the Faculty of Medicine, Nursing and Health Sciences, in Monash University. Eman says *"I was thrilled to find a research group that focuses on the study of the molecular mechanisms and developmental processes orchestrating heart development, and the translation of this knowledge into congenital and adult heart disease as well as cardiac regeneration. This was definitely the opportunity of a lifetime and something I had been looking forward to fulfilling ever since completing my CPH-funded two-month summer internship in the University of Alberta in Canada in the summer of 2012"*. When asked what Eman hopes to accomplish as the end of her PhD, Eman answered, *"I strongly believe that shedding light on the overlapping signalling pathways, which normally function to orchestrate embryonic heart development, will allow us to understand how their dysregulation can lead to CHD. This will prove to be beneficial in designing more efficient genetic screening methods and therapies to ameliorate the burden of the disease on patients"*. Eman is expected to complete her degree in the summer of 2023.

#### **Publications:**

Functional characterization of human myosin-binding protein C3 variants associated with hypertrophic cardiomyopathy reveals exon-specific cardiac phenotypes in zebrafish model Da'as SI, Yalcin HC, Nasrallah GK, **Mohamed IA**, Nomikos M, Yacoub MY, Fakhro K. *J Cell Physiol.* 2020 Jan 13

Osteopontin: A Promising Therapeutic Target in Cardiac Fibrosis

**Mohamed IA**, Gadeau AP, Hasan A, Abdulrahman N, Mraiche F. *Cells.* 2019 Dec 3

Wnt Signaling: The Double-edged Sword Diminishing the Potential of Stem Cell Therapy in Congenital Heart Disease. **Mohamed IA**, El-Badri NS, Zaher A. *Life Sciences.* 2019 Oct 4

Dilated Cardiomyopathy-induced Disruption of Basement Membrane alters the Lever Systems Acting on the Heart. **Mohamed IA**, El-Badri NS, Zaher A. *Med Hypotheses*. 2017 Mar 30

The Role of Cardiac Myosin Binding Protein C3 in Hypertrophic Cardiomyopathy- Progress and Novel Therapeutic Opportunities. **Mohamed IA**, Krishnamoorthy NT, Nasrallah GK, Da'as S. *J Cell Physiol*. 2016 Oct 12

Na<sup>+</sup>/H<sup>+</sup> Exchanger Isoform 1-Induced Osteopontin Expression Facilitates Cardiomyocyte Hypertrophy. **Mohamed IA**, Gadeau AP, Fliegel L, Lopaschuk G, Mlih M, Abdulrahman N, Fillmore N, Mraiche F. *PLoS One*. 2015 Apr 17

Targeting osteopontin, the silent partner of Na<sup>+</sup>/H<sup>+</sup> exchanger isoform 1 in cardiac remodeling. **Mohamed IA**, Mraiche F. *J Cell Physiol*. 2015 Feb 9.