

ISN-CAEN Award Report

Project Title: Investigating the neurobiological mechanisms involved in the adaptogenic-like properties of methyl jasmonate in mice.

Awardee: Mrs. Oritoke M. Aluko, *Ph.D. student*

Home Supervisor: Solomon Umukoro, *Ph.D*

Home Laboratory: Neuropharmacology Unit, Department of Pharmacology and Therapeutics, Faculty of Basic Medical Sciences, University of Ibadan, Nigeria.

Host Laboratory: Laboratory of Psychobiology, Institute of Cell Biology and Neurobiology, European Centre for Brain Research, Santa Lucia Foundation, Rome, Italy.

Host Supervisor: Professor Martine Ammassari-Teule.

Duration of visit: 5 months (March 1 - July 31, 2018).

I received an ISN-CAEN Category 1A award (August 2017 Round) to support my visit to the Laboratory of Professor Martine Ammassari-Teule at the Institute of Cell Biology and Neurobiology, Rome, Italy, to carry out part of my Ph.D. project as a split-site research activity. I arrived safely in Rome and settled in well. I was introduced to the other members of the laboratory and was warmly received. They were all accommodating, ready to assist and willing to share their research experiences with me during my stay.

During my stay, I was given an opportunity to present the preliminary data of my research to scientists in the institute. This provided more insights and ideas on my project. Thereafter, the project was commenced and all reagents, equipment, consumables, and antibodies required were generously provided by my host laboratory. I also attended a seminar at the Sapienza University, Rome. I learned and performed various laboratory techniques, which includes some behavioral assays, Golgi Cox staining, dendritic spine measurements, western blotting, amongst others.

My research was basically investigating the neurobiological mechanisms involved in the adaptogenic-like properties of methyl jasmonate in mice utilizing the unpredictable chronic mild stress model. Methyl jasmonate is a bioactive compound and a naturally occurring anti-stress plant hormone. We have previously reported the ameliorative effect of methyl jasmonate against acute and chronic stress in mice. Hence, this study further investigated the effect of methyl jasmonate on chronic stress-induced cognitive impairment, dendritic spines, and density in the amygdala, hippocampus and prefrontal cortex of mice subjected to various stressors of the unpredictable chronic mild stress paradigm. The dendritic morphology of brains was studied using a Golgi-Cox staining procedure followed by Sholl analysis. It was observed that the unpredictable chronic mild stress model induced a decrease in the number of neuronal dendritic spines and spine density of the dorsal hippocampus, basolateral amygdala and infralimbic region of the prefrontal cortex. The neuroprotective effect of methyl jasmonate as it rescued the decrement of dendritic spines and density caused by chronic stress was also observed. Other molecular mechanisms underlying the effect of methyl jasmonate on chronic stress-

induced cognitive impairment using western blotting techniques for quantification of proteins are being studied and analyzed. Conclusively, this study revealed that MJ increased adaptability to chronic stress and attenuated impaired dendritic morphology which may result in probable dysfunctions in neuronal communication. Due to the safety profile of MJ, it could have a therapeutic outcome in stress-induced cognitive deficits.

A funding of \$3,400 was received by me. This was used for my visa and round-trip flight (\$1,400) and for accommodation within Rome for five months (\$400 per month). Other expenses made on accommodation, transportation, health and travel insurance, feeding and upkeep were supplemented with personal funds. Additionally, my host lab provided part support to assist my participation at the Federation of European Neuroscience Societies (FENS) Forum held in Berlin, Germany.

Overall, my visit to Rome, Italy was very successful and fruitful as I am scientifically improved. I intend to utilize everything learned to positively impact colleagues and students in my home laboratory.

Acknowledgment:

I am very grateful to the ISN-CAEN Committee's members for considering my application for sponsorship. A profound thanks to Professor Martine Ammassari-Teule for this tremendous opportunity. This experience would never have been possible without her readiness to host me in her laboratory. A very special appreciation to Dr. Annabella Pignataro, Ph.D. for teaching me every protocol and technique I learned during my stay. I am also grateful to other great friends and neuroscientists I met during my stay in Italy.



Photo 1: Members of the lab: Veronica, Francesca Stabile, Prof. Martine Ammassari-Teule (sitting), Oritoke Aluko, Dr. Annabella Pignataro from left to right.

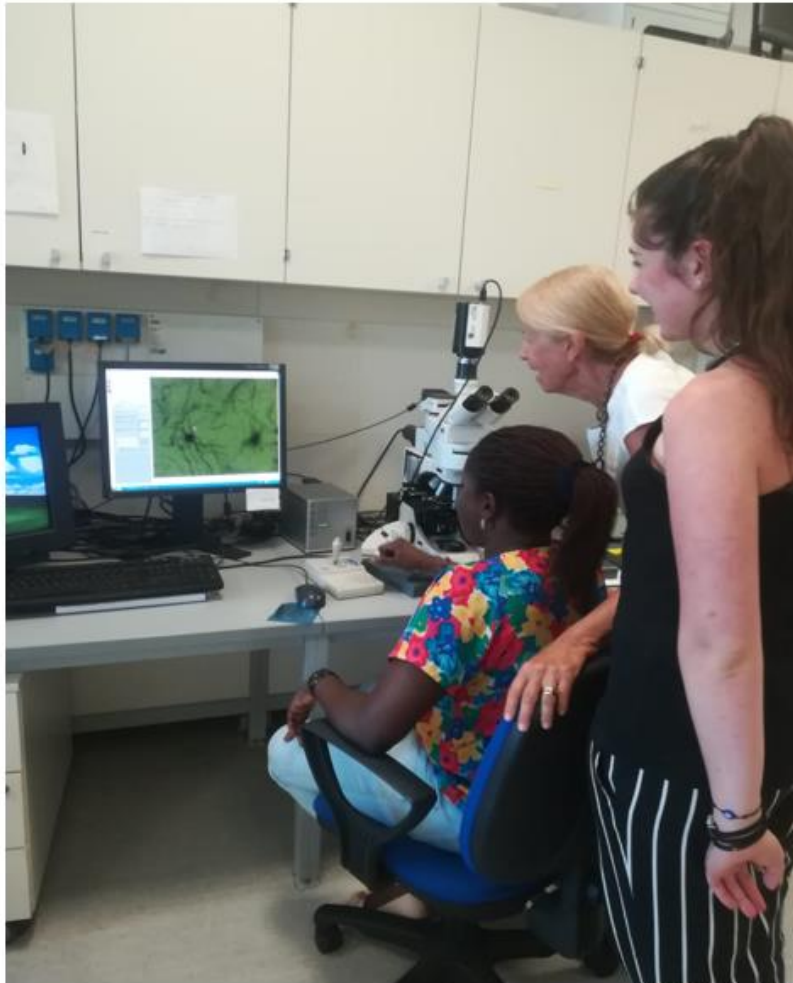


Photo 2: Oritoke Aluko (sitting), Prof. Martine Ammassari-Teule and Francesca Stabile viewing Golgi Cox-stained slides.



Photo 3: Dr. Annabella Pignataro, Prof. Martine Ammassari-Teule, Valeria Sasso, Oritoke Aluko, Francesca Stabile from left to right.



Photo 4: Dr. Annabella Pignataro, Oritoke Aluko, Prof. Martine Ammassari-Teule, and Francesca Stabile, performing a yoga pose (left to right).