

Curriculum vitae

Gabriela Izowit

Nationality: Polish

Date of birth: 30.10.1996

E-mail: gabriela.izowit@student.uj.edu.pl

University: Department of Neurophysiology and Chronobiology,
Institute of Zoology and Biomedical Research,
Jagiellonian University in Cracow



Education

2018 - Jagiellonian University, Faculty of Biology, Cracow, Poland, Neurobiology MSc
2015-2018 Jagiellonian University, Faculty of Biology, Cracow, Poland, Biology BSc
2012-2015 3rd Secondary School of General Education in Krosno, Biology and Chemistry

Language: English (advanced, C1)

Research Experience

April 2017- present: trainee at the Department of Neurophysiology and Chronobiology, Institute of Zoology and Biomedical Research, Jagiellonian University, Cracow, Poland. Supervised by associate professor Tomasz Błasiak.

October 2017 – September 2018: Participation in research project entitled: "Parameters of midbrain dopaminergic neurons' response to electrical stimulation of the lateral parts of dorsal tegmentum across alternating brain states – in vivo studies on urethane anaesthetised rats".

January 2018 - October 2018: Participation in research project entitled: "NMDA receptor independent, acetylcholine induced bursting activity of midbrain dopaminergic neurons - in vivo electrophysiological and pharmacological studies".

January 2018 - September 2018: Participation in research project entitled: "Theta rhythm in nucleus incertus - neuronal mechanism of generation".

September 2018 – present: Participation in research project entitled: "Responses of midbrain dopaminergic neurons of the rat to noxious stimulus across different brain states under urethane anaesthesia".

Original research articles

Izowit G., Walczak M., Drwięga, G., Pradel, K., Solecki, W., Błasiak T. Brain state dependent responses of dopaminergic neurons to the aversive stimulus. (*in submission*)

Izowit G., Walczak M., Błasiak T. Responses of dopaminergic neurons to stimulation of dorsal tegmentum across alternating brain states. *(in submission)*

Presentations on scientific conferences

Izowit G., Walczak M., Błasiak T. (2019) Midbrain dopaminergic neurons' response to electrical stimulation of the LDTg. 13th Göttingen Meeting of the German Neuroscience Society, Göttingen, Germany.

Izowit G., Walczak M., Błasiak T. (2018) Midbrain dopaminergic neurons' responses to the footshock in urethane anaesthetized rat. Abstract Book of 8th International Conference Aspects of Neuroscience, Warsaw, Poland.

Izowit G., Walczak M., Błasiak T. (2018) Midbrain dopaminergic neurons' response to electrical stimulation of the LDTg across alternating brain states of urethane anaesthetized rat. Abstract Book of 8th International Conference Aspects of Neuroscience, Warsaw, Poland.

Izowit G. (2018) Controlling neurons with light - optogenetic tools in neurophysiological studies. Abstract Book of 6th Polish Conference Neuromania, Toruń, Poland.

Conference Attendance

2019	13th Göttingen Meeting of the German Neuroscience Society, Germany
2018	Neuronus IBRO Neuroscience Forum, Cracow, Poland
2018	XI Electrophysiological Conference, Warsaw, Poland
2018	6 th Polish Conference Neuromania, Toruń, Poland
2018	8 th International Conference Aspects of Neuroscience, Warsaw, Poland

Scholarships/Awards

2019	Stephen W. Kuffler Research Scholarship
2018	Award for outstanding speech "Controlling neurons with light - optogenetic tools in neurophysiological studies", 6th Polish Conference Neuromania, Toruń, Poland
2018/19	Jagiellonian University Rector's Scholarship for the best students
2016/17	Jagiellonian University Rector's Scholarship for the best students

Teaching Activities

2019	workshop "Rozwiń skrzydła", Faculty of Biology, Jagiellonian University in Cracow
2018	workshop "Noc biologów", Faculty of Biology, Jagiellonian University in Cracow

Research objectives

Over one and half a year ago I had a great opportunity to join workgroup at the Department of Neurophysiology and Chronobiology of Jagiellonian University in Cracow. Since then I have obtained my bachelor degree in biology and began my master's in neurobiology under supervision of associate professor Tomasz Błasiak. Under his guidance, I had the opportunity to participate in several research projects, which allowed me to learn and master the techniques used in electrophysiological studies *in vivo*.

At present, during my master degree, my research is focused on the responses of midbrain dopaminergic neurons to an aversive stimulus in urethane anaesthetised rats. This type of anaesthesia induces spontaneous, cyclic brain state alternations sharing some characteristics with REM and non-REM phases of natural sleep. Our experiments led us to discover, previously unknown, population of midbrain dopaminergic neurons, which is characterized by dynamic, brain state dependent changes in the type of response to the aversive stimulus. These dopaminergic neurons are inhibited during REM-like brain state, but change the type of response to excitation during non-REM-like brain state. That means that at least some dopaminergic neurons may, depending on the state of the brain, code for both the incentive value of the stimulus (e.g. lowering their activity in response to the aversive stimulus) and the salience of the stimulus (e.g. increasing their activity in response to a significant stimulus). Our findings may be the basis for the unification of two leading theories regarding the function of dopaminergic signalling in the brain.

I would like to continue my current study and conduct further research on brain structures involved in coding of aversion. In particular, I would like to specify, at the level of neural circuits, the mechanism of brain state dependent changes in dopaminergic neurons' responses to noxious stimuli. Better understanding of mechanisms involved in control of dopaminergic neurons' activity may bring us closer to precisely target structures or neuronal subpopulations which malfunctions may be connected to reward system impairments.