UNIVERSITÀ DEGLI STUDI DI MILANO

THE DEPARTMENT OF PHARMACOLOGICAL AND BIOMOLECULAR SCIENCES

presents

Thursday, July 2nd 2015

Via Balzaretti 9, Milan

Registration is free, via email at **nextstep6.register@gmail.com**

Deadline for registration: **June 12th 2015**

UNIVERSITÀ DEGLI STUDI DI MILANO
Department of Pharmacological and Biomolecular Sciences (DiSFeB)
Via Balzaretti 9, Milano

Registration is free, via email at **nextstep6.register@gmail.com**
Deadline for registration: **June 12th 2015**

Thursday July 2nd 2015 – SCIENTIFIC PROGRAM

8:00 – 8:45 **Registration**
8:45 – 9:00 **Opening** *Prof. Giorgio Racagni, DiSFeB Director*
9:00 – 10.45 **Oral presentations, 1st session**

Neuroscience Field *Chairmen: Davide Lecca, Tanmoy Samaddar*	Metabolism Field *Chairmen: Alessandra Ferrari, Paola Corsetto*
9.00 – 9.15 Veronica Begni *BDNF modulation in response to stressful life events: role of DNA methylation and miRNAs* **9.15 – 9.30 Paolo Tornese** *Time-dependent modulation of AMPA/NMDA receptor subunits and changes in working memory induced by acute stress* **9.30 – 9.45 Luca Castelnovo** *GABA-A receptor subunits in Schwann cells are cross-regulated in GABA-B null mice* **9.45 – 10.00 Daniele Riccio** *The $P2Y_2$ purinergic receptor: a new therapeutic target in trigeminal inflammatory pain* **10.00 – 10.15 Maria Elena Cicardi** *The role of the Protein Quality Control system in motorneuronal and muscular models of motor neuron diseases* **10.15 – 10.30 Maria Serena Paladini** *Genome-wide analysis of LPS-induced inflammatory response in the rat ventral hippocampus: modulatory activity of the antidepressant agomelatine* **10.30 – 10.45 Giada Amodeo** *Human adipose-derived stromal cells and their conditioned medium induce a long lasting relief of painful symptoms in STZ-induced diabetic neuropathy*	**9.00 – 9.15 Matteo Audano** *A cytoplasmic RNA binding protein (RBP) controls skeletal muscle differentiation* **9.15 – 9.30 Simone Romano** *Cholesterol and diabetic encephalopathy* **9.30 – 9.45 Alessandra Fidone** *Epigenetics and metabolism: the role of histone modifications in metabolic diseases* **9.45 – 10.00 Elena Signoretto** *Characterization of Dictyostelium discoideum Nramp1 and Nramp2 transporters expressed in Xenopus oocytes* **10.00 – 10.15 Federica Lolli** *Hepatic ERα coordinates metabolic and inflammatory response to nutritional changes in female liver* **10.15 – 10.30 Chiara Macchi** *Glucose and lipid homeostasis during confinement in a 520-day simulated interplanetary mission to Mars* **10.30 – 10.45 Chiara Ricci** *STAT3 inhibition induces PCSK9 in hepatic cell line: possible involvement in hypertriglyceridemia associated with insulin resistance*

10:45 – 11.15 **Coffee break**
11.15 – 13.15 **Round Table: *«50 Shades of Research»***
13.15 – 14.30 **Lunch**
14.30 – 16.00 **Oral presentations, 2nd and 3rd sessions**
16.00 – 16.15 **Short Break**
16.15 – 17.30 **Oral presentations, 2nd and 3rd sessions**

Immunology Field *Chairmen: Diletta Scaccabarozzi, Silvia Franchi*	Nutraceutical Field *Chairmen: Chiara Di Lorenzo, Enrico Sangiovanni*
14.30 – 14.45 Giulia Dell'Omo *The oscillatory expression of ERα as a new drug target for resensitizing hormone-refractory breast cancer* **14.45 – 15.00 Angela Papale** *Molecular mechanisms involved in chemical allergen-induced IL-18 production in a human keratinocyte cell line* **15.00 – 15.15 Giovanna Pepe** *Genome-wide expression analysis of estrogen action in macrophages*	**14.30 – 14.45 Monica Marzagalli** *Vitamin E-derived delta-tocotrienol against melanoma: molecular pathways leading to cell death* **14.45 – 15.00 Francesca Colombo** *Development of novel rapid methods to assess the antioxidant activity associated with food compounds* **15.00 – 15.15 Marco Fumagalli** *Anti-inflammatory activity of different varieties of raisin (Vitis vinifera L.) in human gastric epithelial cells: a comparative study*
Neuroscience Field *Chairmen: Silvia Giatti, Manuela Mellone*	**Cardiovascular Field** *Chairmen: Alice Ossoli, Gianpaolo Tibolla*
15.15 – 15.30 Giusy Coppolino *Promoting re-myelination in Multiple Sclerosis via the GPR17 receptor, a new key actor in oligodendrogenesis* **15.30 – 15.45 Nathalie Sala** *Brain area-specific changes in glucose metabolism in rats after acute stress* **15.45 – 16.00 Riccardo Cristofani** *Misfolded proteins toxicity in motor neuron diseases*	**15.15 – 15.30 Gloria Balzarotti** *PI3K-C2b plays a key role in the activation and the proliferation of T lymphocytes: impact on vascular diseases* **15.30 – 15.45 Eva Tarantino** *ASA decreased venous thrombosis by reducing tissue factor in a thromboxane dependent-manner in mouse* **15.45 – 16.00 Federica Dellera** *Effect of homoarginine on neointima formation in balloon-injured rat carotid arteries*
Short Break	**Short Break**
16.15 – 16.30 Stefano Musardo *Development of innovative tools for Alzheimer's disease therapy* **16.30 – 16.45 Chiara Malpighi** *Repeated exposure to cocaine alters molecular mechanisms involved in the regulation of cognition in adolescent rats* **16.45 – 17.00 Simona Melfi** *Decrease in NF2 expression induces changes in Schwann cell differentiation* **17.00 – 17.15 Natalia Marchetti** *Interleukin-1beta induces long-term effects on the development of glutamatergic neurons*	**16.15 – 16.30 Giulia Ganzetti** *Effect of a single infusion of Tetranectin-ApoA-I on atherosclerosis in rabbits* **16.30 – 16.45 Fabio Lucca** *Role of LpX in the development of renal disease in LCAT deficiency* **16.45 – 17.00 Andrea Baragetti** *Genetic variants affecting Leukocytes Telomere Length and its shortening are associated with cardio-metabolic impairment and cardiovascular prognosis in the general population* **17.00 – 17.15 Paola Canzano** *Impact of chronic kidney disease on the platelet phenotype and the plasma proteomic profile of CAD patients* **17.15 – 17.30 Laura Rossetti** *Hypertension upregulates platelet tissue factor expression in stroke-prone rats*

17:30 – 18.00 **Closing remarks and Award Ceremony for the best oral presentations**
18.00 **Happy Hour**

Brain area-specific changes in glucose metabolism in rats after acute stress

N. Sala[1], L. Musazzi[1], G. Di Grigoli[2], P. Tornese[1], F. Sala[1], S. Valtorta[2], V. Masiello[2], RM. Moresco[2] and M. Popoli[1]

[1]Lab. of Neuropsycopharmacology and Functional Neurogenomic, Dept of Pharmacological and Biomolecular Sciences, University of Milano, Italy
[2]Department of Nuclear Medicine, San Raffaele Scientific Institute, Milan, Italy and Mouse HistoPathology Unit, Department of Pathology San Raffaele Scientific Institute, Milan, Italy
nathalie.sala@studenti.unimi.it

Neuroscience

Keywords: Acute stress, Glucose metabolism, Positron Emission Tomography, Hexokinase, Glucose uptake

ABSTRACT

Stress is known to be one of the main risk factors for neuropsychiatric disorders. The stress response is a physiological mechanism of adaptation essential for survival but, when the stressful event is prolonged or overwhelming, maladaptive mechanisms could occur, thus increasing the risk to develop a stress-related pathology. Several human and *ex vivo* animal studies tried to investigate how brain responds to stressors and which cerebral areas are involved, but only in the last years, with the recent progress in neuroimaging techniques such as Positron Emission Tomography (PET), it has been possible to study metabolic and neurobiological changes induced *in vivo* by stress. Compelling evidence shows that energy metabolism and mitochondrial activity are affected by stress: at a cellular level stress results to be linked to premature cellular ageing and shortened telomeres. Because mitochondria actively regulate synaptic transmission, brain seems to be vulnerable to bioenergetic fluctuations and mitochondrial defects induced by stress.

Main aim of the present study was to evaluate the effect of acute foot shock (FS) stress on brain glucose metabolism in rats. We took advance of [18F]FDG-PET studies on FS-stressed rats to highlight which brain areas were activated/inactivated by stress. Our results showed an increase of energy consumption in rostral regions, while in more caudal areas acute stress induced a decrease in glucose metabolism. In order to understand whether these changes in activation of selected brain areas were related with modifications in synaptic glucose metabolism, thus suggesting changes in synaptic function, we measured enzymatic activity of hexokinase, the rate-limiting enzyme for glycolysis in the brain. In line with previous results, hexokinase activity resulted to be increased by acute stress in synaptosomes from prefrontal cortex and dorsal hippocampus while showing an opposite trend in those from ventral hippocampus. Moreover, as we wanted to investigate *ex vivo* whether our previous results reflected real changes in synaptic glucose consumption, we analyzed synaptic glucose uptake by measuring the uptake of the glucose analogous 2-Deoxy [3H] glucose in perfused purified synaptosomes from stressed rats. Data from the uptake of 2-Deoxy [3H] glucose are also consistent with previous results.

Taken together, these results suggest that acute stress induces area-specific changes in glucose metabolism, immediately after the stress episode.