The CAJAL Advanced Neuroscience Training Programme
NUTRITION AND BRAIN FUNCTIONS (NBF) 2016

Speakers

21/09/2016
Richard BAZINET (Toronto, Canada) What the brain uptake rate of fatty acids tells us about their dietary requirements: Implications for food sources and the environment
Olivier MANZONI (Marseille, France) Food for thoughts

22/09/2016
Frédéric CALON (Québec, Canada) Comparing dietary interventions in animal models of neurodegenerative diseases: cognitive enhancement or disease modification
Sophie LAYE (Bordeaux, France) How does dietary fatty acids influence brain function

23/09/2016
SUSANNE LAFLEUR (The Netherlands) The interaction between nutrition and the brain; studies in rodents and men
Dana SMALL (USA) When a calorie is not a calorie: Unravelling the signals driving sugar reward

26/09/2016
André MARETTE (Québec, Canada) Targeting the gut microbiome to combat obesity-linked diseases
Ron DE KLOET (The Netherlands) Glucocorticoids and Brain: from early life to senescence

27/09/2016
Daniela COTA (Bordeaux, France) Hypothalamic nutrient sensing in the regulation of energy balance
Amanda SIERRA (Bilbao, Spain) Of ghost neurons and ravenous microglia: coupling between apoptosis and microglial phagocytosis in health and disease

28/09/2016
Laurent GAUTRON (Houston, USA) Neural Control of Energy Balance: Translating Circuits to Therapies
Sébastien BOURET (Los Angeles, USA) Developmental programming of appetite

03/10/2016
Mathias TSCHÖP (Munich, Germany) Neuroendocrine polypharmacy targeting obesity and diabetes
Ana DOMINGOS (Lisboa, Portugal) Lean on body neurons

04/10/2016
Carmen SANDI (Switzerland) The impact of stress and anxiety on behavior and brain metabolism
Giovanni MARSICANO (Bordeaux, France) Role of mitochondrial CB1 receptor in energy metabolism

06/10/2016
John CRYAN (Cork, Ireland) The Gut Microbiome: a Key Regulator of brain Function Across the Lifespan
Aniko KOROSI (The Netherlands) Programming of brain structure and function by early-life stress: a role for nutrition and opportunities for interventions
Practical courses

Project 1: Cellular and behavioral characterization of the effect of high-fat diet on hippocampal function
Instructors: Guillaume Ferreira (NutriNeuro, Bordeaux, France), Mariano Ruiz-Gayo (Madrid, Spain), Mario Carta (IINS, Bordeaux, France)
Technical approaches: in vitro patch clamp, biochemistry (WB), behavior (object location memory)
With this project, attendees will learn how to study the effect of diet on memory and neurobiological processes

Project 2: Deleterious effects on omega-3 deficiency on neurogenesis and related spatial memory. Focus on microglial cells
Instructors: Agnès Nadjar (NutriNeuro, Bordeaux, France), Amanda Sierra (Univ Basquo, Spain), Jorge Vallero (Univ Basquo, Spain)
Technical approaches: FACS and cell sorting, RTqPCR on extracted cells, confocal analysis, confocal microscopy, behavior (Morris water maze), transgenic mice
With this project, attendees will learn how to study the effect of diet on neuroinflammatory processes and neurogenesis

Project 3: Macrophage-dependent metabolic alterations in diet-induced obesity
Instructors: Ana Domingo (Gulbenkian Institute, Portugal), Xavier Fioramonti (Dijon, France), Agnès Nadjar (NutriNeuro, Bordeaux, France)
Technical approaches: in vivo two-photon microscopy, ELISA, metabolic study (food intake, glucose tolerance test...)
With this project, attendees will learn how to study the effect of diet on metabolism and peripheral neuroinflammatory processes

Project 4: Effect of Docosahexaenoic acid on synaptic transmission and plasticity
Instructors: Clémentine Bosch-Boujut (NutriNeuro, Bordeaux, France), Olivier Manzoni (Marseille, France)
Technical approaches: in vivo administration of dietary lipids, electrophysiology (patch-clamp), cellular imaging, pharmacology
With this project, attendees will learn how patch-clamp electrophysiology can be used to study the impact of nutrients on brain function at cellular and molecular levels.

Project 5: Involvement of fat metabolism in CBG-KO mice cognitive impairments
Instructors: Aniko Korosi (Amsterdam, The Netherlands), Marie-Pierre Moisan (NutriNeuro, Bordeaux, France)
Technical approaches: immunohistochemistry and stereological quantification, free corticosterone and metabolic evaluation (isotopic dilution, ELISA, RIA), proteomic, behavior (Morris Water Maze)
With this project, attendees will learn how study stress reactivity and memory linked to nutrition

Project 6: Dietary lipids, brain lipid metabolism and dopamine metabolism
Instructors: Richard Bazinet (Toronto, Canada), Sylvie Vancassel (NutriNeuro, Bordeaux, France)
Technical approaches: fatty acid gas-chromatography, i.v. injection of a stable isotope, HPLC, microdialysis
With this project, attendees will learn how to study the lipid metabolism and monoamine metabolism in the brain
Project 7: Gut leakiness and intestinal neuro-glia interaction: impact on metabolism and food motivation
Instructors: Laurent Gautron (Houston, USA), Muriel Darnaudéry (NutriNeuro, Bordeaux, France)
Technical approaches: Food Motivation (Operant skinner boxes), whole-mount immunohistofluorescence and confocal microscopy of alpha-synuclein and glial markers in the intestines
With this project, attendees will learn how to study the role of dietary imbalance on leaky gut and food motivation

Project 8: Optogenetic, dopamine and food motivation
Instructors: Pierre Trifilieff (NutriNeuro, Bordeaux, France), Cyril Herry (NCM, Bordeaux, France)
Technical approaches: Food Motivation (Operant skinner boxes), optogenetic, EEG recording
With this project, attendees will learn how to study the role of dopaminergic brain circuitry in motivation for food

Project 9: How does sugar drinking induce fat feeding?
Instructors: Susanne Lafleur (The Netherlands), Pierre Trifilieff (NutriNeuro, Bordeaux, France)
Technical approaches: stereotactic brain surgery for cannula placement, artery cannulation for infusions to the brain, transcardial perfusion, immunohistochemistry, western blots, RT-qPCR
With this project, attendees will learn whether blocking opioid signaling in the CeA reduces fat intake specifically in animals on fCHFS diet. Moreover, the changes in the brains CeA-VTA-NAc circuitry will be determined in animals that have been drinking sugar and then are given a fat meal, or a brain infusion of fat.

Project 10: A journey into food-related behavior
Instructors: Etienne Coutureau (INCIA, Bordeaux, France), Shauna Parkes (NutriNeuro, Bordeaux, France), Fabien Naneix (INCIA, Bordeaux, France)
Technical approaches: Hedonic responding to a palatable food by studying oral mimic stereotypies, sophisticated instrumental behavior to measure motivation
With this project, attendees will learn how to study behavior directed toward food procurement and consumption which is very complex since it involves the integration of cognitive, motivational and hedonic factors