

Report on the **EASO NIU Summer School: Obesity – a multi-systemic disease**

June 28 – July 1, 2016, Lisbon Cascais, Portugal

The aim of NIU summer school was to address obesity from a wide perspective, providing to participants not only knowledge and skills, but also different points of discussion related to the pathophysiology of obesity and the treatment. The lectures covered topics from basic science and common cardiovascular complications to the management of the obese patient throughout behavioral and nutritional changes, and considerations on pro and cons of bariatric surgery.

The program was covered in two and a half days, with different parts of Europe represented by both speakers and delegates.

The first day started with a lecture on **Adipose tissue dysfunction in obesity** from **Prof Gijs Goossens** (Netherlands) who presented interesting and new data on the role of hypoxia on adipose tissue metabolism and its association with insulin sensitivity in lean and obese subjects. Afterwards, with a lecture titled **Brown adipose tissue in obesity: importance in human vs rodents**, **Prof Kirsi Virtanen** (Finland) discussed the role of brown adipose tissue metabolism in obesity and showed the main techniques used to measure brown adipose tissue activation.

The third lecture was on **Appetite regulation in obesity** and was held by **Dr Clare Llewellyn** (UK). She showed her data on the Gemini cohort, suggesting a role for obesity genes in appetite regulation. Thereafter, **Prof Gianluca Perseghin** (Italy) gave an overview on **Endocrine modulation in obesity**, focusing on metabolic regulation, insulin sensitivity and metabolic adaptation in the so-called metabolically healthy obese vs metabolically abnormal obese subjects.

The session was closed by **Prof Tommy Visscher** (Netherlands), who talked about **Perceived health status: is overweight recognized as a risk factor?** He showed that weight status is underestimated, especially by overweight and obese people, and parents often misperceive their child's weight status. He stated that the environment has a role on the weight perception, and stigmatization is a problem, especially between adolescents. He introduced the representative of the EASO Patient Council in Portugal, Mr. Carlos Oliveira who talked about the initiatives run in his Country to promote new public health policies in order to help obese people reducing weight and improving their health status and social condition. He showed two short-films, which are part of

EASO Patient Council dissemination activities in Portugal. This was particularly interesting to the audience, most of whom would not have seen something like this before.

The second day started with a lecture on the **Effect of maternal obesity on fetal growth and metabolic health of the offspring** held by **Prof Claudio Maffeis** (Italy). Data show that parental BMI and birth weight are predictors of obesity. Exposure to hormones and nutrients, including leptin, insulin, glucocorticoids and high plasma glucose, during fetal life may have a role in the fetal programming of obesity by affecting epigenetic mechanisms. Especially, growth in the first part of life seems associated with maternal glycaemia during pregnancy. The second lecture was on **Obesity and vascular dysfunction (implications for CVD)** from **Prof Coen Stehouwer** (Netherlands). He showed that insulin leads to vasodilation in healthy lean subjects, but it becomes a vasoconstrictor in presence of high blood fatty acids and cytokines levels, as occurs in obesity.

After the coffee break, the first group of delegates introduced themselves and their work with 5 minute presentations. This gave the young scientists the opportunity to present their work to their peers and the invited speakers enabling them to link up with people of similar research interested. Afterward, **Prof Maria Hassapidou** (Greece) presented a lecture on **Nutritional intervention to treat obesity-related complications**. Data show that the dietary pattern of Mediterranean diet is associated with reduced cardiovascular morbidity and mortality. Some guidelines have been developed to address specific CVD and metabolic problems, such as hypertension or type 2 diabetes mellitus.

The second part of the day was dedicated to **practical training on Nutritional analysis**, held by **Prof Maria Hassapidou** and **Round-table discussion on career possibilities in Europe: What aspects should be considered?** chaired by several senior investigators, including **Prof Gijs Goossens, Prof Kirsi Virtanen, Prof Tommy Visscher, Prof Coen Stehouwer** and **Prof Karin Schindler**.

The third day started with a lecture entitled **Is a drug treatment for obesity feasible today?** from **Prof Volkan Yumuk** (Turkey) who gave a comprehensive overview of the drugs available on the market and their mechanism of action. He discussed the relationship between feasibility and effectiveness in the treatment of obesity. The second lecture focused on **Bariatric/metabolic surgery: What about long-term outcome?** from **Karin Schindler** (Austria). She highlighted the importance of exploring nutritional aspects and micronutrients deficiencies pre- and post-bariatric surgery, since they affect the success of the bariatric surgery intervention itself, including diabetes remission. The third speaker was **Prof Ana Domingos** (Portugal) who presented the **Fat-brain**

axis. By using optogenetic techniques, she showed that localized activation of peripheral neurons within the adipose depots is sufficient to drive lipolysis and to reduce fat mass. The fourth lecture was on **Behavioral change considerations for physical activity/exercise intervention in obesity** from **Prof Pedro Teixeira** (Portugal). He showed that there are 83 different theories on behavioral changes and he focused on the self-determination theory. Motivation to change has to be considered not only quantitatively but also qualitatively, since internal but not external motivational reasons lead to success in behavioral change.

Before and after lunch the second and the third groups of delegates introduced themselves and their work.

Afterwards, **Prof Jeroen Lakerveld** (Netherland) presented his lecture on **Obesity prevention: The build environment** which highlighted the complexity of the environmental determinants that can be associated with the risk to develop obesity and metabolic disease. Environmental determinants can be classified according to size in micro- (e.g. house), meso- (e.g. neighborhood), and macro- (e.g. countries) and according to type in physical, socio-cultural, economic and political. The scientific program finished with two presentations on **How to write a grant application** and **How to get a paper published in a high impact journal** given by **Prof Gijs Goossens** and **Dr Clare Llewellyn** respectively. They both shared their own experiences and gave practical and useful advice.

To sum up, this Summer School was indeed able to cover multiple aspects on obesity disease and represented an excellent chance to create a network for scientific exchange and future collaborations. Delegates participated very actively during several discussions after presentations, but also during the coffee, lunch and dinner breaks, gave positive feedback and appreciated very much to have the opportunity and the time (that only a summer school contest/environment can provide) to discuss and exchange opinions and ideas amongst themselves and with senior scientists. Before the end of the summer school there were a number of plans in place by the delegates to visit each other's laboratories and plans to combine visits to the labs of the senior invited speakers.