

XV SCIENCE FESTIVAL

16-25 September 2011

YOUTH CLUB

24. *Principles of transcription regulation in eukaryotic genomes* – B. Kamińska-Kaczmarek, However, all cells in a body contain identical DNA, there is a heterogeneity of cell morphology and function. How do different types of cells know which types of proteins they must manufacture and how does a gene know when it should express itself? Understanding mechanisms of gene expression regulation in eukaryotes is one of the most fascinating area of biology. Control of eukaryotic transcription involves combinatorial interactions between transcription factors and regulatory sequences in the genome. In addition, chromatin structure and modification states play key roles in the complex control of transcription.

25. *Structure and function of proteins – from genome to proteome and beyond* – S. Piękała, **20** Our contemporary knowledge about function and organization of living matter is a result of breakthrough discoveries from XX and XXI centuries describing properties of nucleic acids and mechanisms of synthesis of biologically active macromolecules – proteins and peptides. However, gaining full knowledge about the genome of every organism, including man, is only a beginning. It goes further through the establishment of structure and function of great variety of proteins and peptides (proteome), than their participation in cellular metabolism (metabolome), signal transduction processes (signalome), interactions between biomolecules (interactome) and beyond. Up to our best knowledge is better to conclude that this route will never ends.

26. *Contribution of Nobel prize winners to the advances in bio-medical research* – E. Wyroba

Achievements of Nobel Laureates in many fields played a key role in development of methods indispensable in modern biology and medicine. 110 years ago the first x-ray picture was taken, next ultrahigh magnification in electron microscopy broke the boundaries of resolution, whereas computer assisted tomography was a break-through in medicine. Recently rainbow proteins and glowing genes captured attention.

27. *Mechanism of regulation of cellular metabolism* – R. Jarzyna (guest UW)
Procesy metaboliczne zachodzące w komórce tworzą skomplikowany układ współzależności. Jego prawidłowe działanie wymaga precyzyjnej kontroli i regulacji. Zrozumienie tych mechanizmów jest kluczowe w tworzeniu nowych strategii terapeutycznych.

THEMATIC CLUBS - TAKE CARE OF HEALTH

151. *Why diabetes is a 21st century disease?* – A. Dobrzyń
Diabetes has been dubbed the illness of the 21st century. According to World Health Organization (WHO) estimates, at the turn of this century 2 million individuals were diagnosed with diabetes in Poland, and this is expected to increase to 5 million by 2030. Diabetes is frequently accompanied by several diseases including obesity, dyslipidaemia, hypertension, cardiovascular disease and fatty liver. WHO reports that the consequences of these diseases, commonly described as the Metabolic Syndrome, are one of the main causes of death in highly developed countries. What is Diabetes Mellitus? Why does the number of

people diagnosed with this disease increase so fast? What is a difference between diabetes type 1 and diabetes type 2?

152. *Scientific tips for the healthy brain* – R. K. Filipkowski

During the lecture, we would learn how and why we can take care of the health of our brain in order to keep the mind sharp and preserve the quality of life.

The lecture compiles the scientific results of experiments done with humans and animals, which concern the impact of our way of living, eating habits, taking care of the curable diseases and getting rid of some of our behaviors – on the health of the brain.

In order to understand and explain some of the processes, several mechanisms of brain functioning will be presented, such as neurogenesis and epigenetics..

153. *Can we live healthier and longer?* – G. Mosieniak

Nowadays, thanks to blessings of civilization, we are living much longer. Unfortunately this longevity is connected with increased risk of serious pathologies like cancer, diabetes, and neurological disorders. Thus, revealing of the molecular and environmental factors that determine the life span become one of the main goal of present research. In course of the lecture the mechanisms regulating aging and longevity would be discussed. We will try to answer the question whether pharmacological intervention could prolong our healthy life. To what extent the longevity depends on genes or could we influence on the length of our life?

154. *In healthy skin – healthy person* – T. Wilanowski

The skin is our sensual organ, defense against external threats and has decisive influence on our appearance. In the skin there are numerous glands: sebaceous, sweat and mammary. The skin produces hair, nails and other appendages. The skin renews itself throughout life: the epidermis peels, the hair and nails grow, etc. The skin must also be capable of healing wounds. Without a healthy skin one cannot function normally. This lecture will discuss some skin diseases, such as the lack of waterproof skin barrier, impaired wound healing, palmoplantar keratoderma and hair loss. We will discuss their causes, methods of prevention and treatment

WEEKEND MEETING

323. *What is there in our head?* – PhD students

Come and hear the interesting facts about the brain, feel the atmosphere of the laboratory, and learn the „Secrets of the neurobiology lab”. The youngest participants conduct experiments by themselves in the Biological kindergarten

The lecture will cover the topics connected with the nervous system. During the workshop we will show how the microscopic preparations used in brain research are being prepared in our lab. Participants will learn how to set up the microscopic preparation from the stage of preparing the tissue to the image analysis with the use of light or fluorescent microscope. In the biological kindergarten kids will be able to become scientists and conduct simple experiments by themselves. Moreover, educational games, shows, and contests are planned.