

The 9th Baltic Summer School

INFLAMMATION: A Key to Common Complex Diseases

Background

The goal of BSS 2007 is to address the emerging understanding of inflammatory mechanisms as the key mechanism underlying large common but complex diseases. This is well known in autoimmune diseases like rheumatoid arthritis and in allergic diseases like asthma but is now also accepted in diseases like atherosclerosis, psoriasis and Alzheimer. Future translation of new key scientific findings to clinical reality will require understanding of the basic inflammatory process.

Inflammation is a physiologic response necessary for maintaining tissue homeostasis and for the defense against an aggressive environment of pathogens. The natural selection forming our genes is therefore heavily influenced by pathogens as well as challenged by trauma, child production, stress and ageing. In the modern world many of these environmental influences have changed dramatically with the consequence that our genetic constitution sometimes does not operate well together with the environment we currently live in. Thus, we see a striking increase of allergic and various autoimmune diseases, which have inflammatory mechanisms as their main driving component.

Over the years a picture has emerged that inflammatory mechanisms are a key component in a number of important diseases that previously were regarded as caused and influenced primarily by other factors. For example, cardiovascular disease is today seen as an inflammatory disease initiated by a disturbed vasculitis response, which is further dependent on immune mechanisms. Major skin diseases like psoriasis are thought to be caused by T cell driven inflammatory response. The initiating and driving forces behind the major dementia disease, Alzheimer, is today believed to be related to inflammatory mechanisms. Many forms of osteoarthritis have a strong genetic component and are inflammatory in nature. Type I diabetes is clearly an autoimmune inflammatory response against insulin-producing cells in the pancreas and we are today also seeing important inflammatory mechanisms in the more common type 2 diabetes. Cancer is thought to be connected with ageing of the cells but a major factor for lack of control of these cells is defectiveness in making a proper inflammatory response by the host. Tumors may also develop into inflammatory cells as a result of their chronic activation. In addition to the first focus of the course, key events in inflammation and immunity, the question of how to transform our basic knowledge into useful approaches for treatment and diagnostics of these diseases will also be addressed. The introduction of treatment targeting TNF-alpha has been a dramatic turning point in the perspective on how to combat these diseases. Anti-TNF-alpha was developed as a result of investment in basic science, which eventually made its way to clinical therapy. It is not complete and does not directly address the cause of these diseases but it has a dramatic effect on rescuing tissues from being destroyed by the inflammatory attack. For the future we expect even vaccinating and therapeutic curative treatment to be developed in autoimmune and inflammatory

diseases.

The BSS workshop and course 2007 focuses on the conceptual issues of inflammation in a series of in-depth lectures, discussions, seminars and round-tables held by international experts in the field. The focus of BLC lies in the transfer of new methods and technologies, which are important for competent and high profiled scientific work in the field (engaging the best laboratories at the participating Universities).