

Langerhans cell histiocytosis: Bystander cells, interactions and pathophysiology

summary of the 14th Nikolas Symposium

In the 14th edition of the Nikolas Symposium, a group of clinical and research experts gathered around the topic "Langerhans Cell Histiocytosis: bystander cells, interactions and pathophysiology". This meeting was a logical follow-up of last year's symposium, which focused on the question whether LCH is a cancer-like disease or a chronic inflammation. In both cancer and inflammation, normal white blood cells, which form our immune defense system, infiltrate the locations of affected tissue. This is also the case at the sites where abnormal Langerhans cells accumulate in LCH. The infiltrating white blood cells probably have a profound influence on the biological behavior of the aberrant Langerhans cells. Discussing the importance of the "bystander" white blood cells in the LCH sites was the main purpose of this symposium.

Specialists on the various white blood cell types shared the latest insights on their cells' functions, and particularly the interactions with other cell types. An important realization was that the different white blood cells form a functional network in which they regulate each others activities. A stable balance in this network is essential for the proper function of the immune defense mechanism. Activation of our immune system is needed for protection against harmful microbes, but uncontrolled activation, due to a disturbed immune balance, is very harmful. This is the cause of many diseases, including allergies, like asthma, and autoimmune diseases like rheumatoid arthritis. It was concluded that in LCH similar stimulating interactions between the cells at the affected sites probably occur. In particular T-lymphocytes, a specific type of white blood cells, are suspected to play an important role in the stimulation of LCH cells.

Recent research has shown that different types of T-lymphocytes exist, which stimulate or inhibit - depending on the subtype - the function of other neighboring cells, including Langerhans cells. Thus, it is quite possible that the T-lymphocytes, which are always present at affected LCH sites, are major players in the disease. However, very little is known about the nature of the T-lymphocytes involved in LCH. Thus, it was felt that new research projects in this area need to focus on the role of these T-lymphocytes. Another conclusion from the meeting is that now the time is ripe to apply exciting new technology (so-called "DNA-micro array") for the elucidation of the molecular differences between LCH cells and normal Langerhans cells. This approach should bring light into the mechanisms that cause the abnormal behavior of the LCH cells, and thus the disease process.

Taken together, this Nikolas Symposium highlighted that the "bystander" cells are probably much more than innocent spectators. These cells can be very important in directing the composition and maintenance of the disease sites, especially by supporting the abnormal LCH cells. Interestingly, this raises the possibility that new therapeutic developments can also be directed at the bystander cells. Treating the bystanders might well treat the LCH cells, and thus the disease.