



The study was published recently in the *Journal of Immunology*

New Indicators to Reveal the Progression of COPD

Barcelona, 24 May 2012. Researchers at the IMIM (Hospital del Mar Research Institute) and the Hospital del Mar **have studied the role of NK cells in the development and progression of Chronic Obstructive Pulmonary Disease (COPD) when a viral infection is present.** The results from the study show that these cells play a decisive role in the natural progression of the disease. The mechanisms are associated with the activation of NK cells by one of their proteins (NKG2D) acting as a receptor. This finding is highly significant given that the majority of aggravating factors for COPD are believed to be caused by viral infections.

COPD is a disease that affects 2 million people in Spain and that causes some 18,000 deaths per year. It is characterised by the presence of an obstruction in the airways that is usually progressive and non-reversible. It is mainly caused by tobacco smoke and its main symptom is reduced breathing capacity that slowly worsens over time and leads to a considerable deterioration in the quality of life for sufferers with severe symptoms, extended periods in hospital involving high healthcare costs and, eventually, premature death.

NK cells, also known as natural killer cells, are an important part of the innate immune system as they are capable of destroying tumour cells and virally infected cells. The NKG2D receptor also has anti-viral and anti-tumour properties. It is an immune-activating receptor that is expressed in the majority of immune cells, including NK cells.

The researchers discovered that NK cells regulate the inflammatory level of CPOD when a viral infection is present and that NKG2D can neutralise the capacity of NK cells to eliminate viral cells in pathologies induced by flu in mouse models with CPOD. These findings indicate that alterations in NK cell functions will have significant consequences in patients with CPOD and infected with a virus. Within the context of the disease, the presence of virally-provoked overactive NK cells could increase the inflammatory response and aid the progression of CPOD.

The study carried out with mice exposed to tobacco smoke concludes that the NKG2D receptor is involved in the appearance of an exaggerated inflammatory response (pulmonary and systemic) that characterises those individuals susceptible to developing chronic respiratory diseases and muscular dysfunction.

Reference article

"NKG2D Mediates NK Cell Hyperresponsiveness and Influenza-Induced Pathologies in a Mouse Model of COPD". Brian W. Wortham, Bryan L. Eppert, Greg T. Motz, Jennifer L. Flury, Mauricio Orozco-Levi, Kasper Hoebe, Ralph J. Panos, Melissa Maxfield, Stephan W. Glasser, Albert P. Senft, David H. Raulet, and Michael T. Borchers. *J Immunol* 2012. DOI: 10.4049/jimmunol.1102643

For further information

Rosa Manaut (IMIM Communication Manager) Tel.: (+34) 618 509 885 or Marta Calsina (IMIM Communication Service) Tel.: (+34) 933 160 680 and (+34) 638 720 000.