IN BRIEF

APOPTOSIS

Apoptotic human cells inhibit migration of granulocytes via release of lactoferrin

Bournazou, I. *et al. J. Clin. Invest.* 1 Dec 2008 (doi:10.1172/JCI36226)

The reason why apoptotic cells selectively recruit mononuclear cells and not other phagocytes such as neutrophils for their rapid uptake is not known. Now, Bournazou ***et al.*** show that apoptotic (but not necrotic) human cell lines secrete lactoferrin, a glycoprotein with known anti-inflammatory properties. Lactoferrin inhibited the migration of neutrophils but not other types of phagocyte ***in vitro*** and ***in vivo***. Furthermore, lactoferrin-pretreated neutrophils stimulated with the chemoattractant fMLP showed impaired activation and reduced adherence and motility compared with neutrophils stimulated with fMLP alone. These effects were possibly due to reduced phosphorylation of ERK (a kinase that is involved in cell motility and actin reorganization) in lactoferrin-pretreated neutrophils. So, these data identify lactoferrin as an anti-inflammatory factor that is produced by apoptotic cells and inhibits neutrophil recruitment.

TUMOUR IMMUNOLOGY

DNAM-1 promotes activation of cytotoxic lymphocytes by nonprofessional antigen-presenting cells and tumors

Gilfillan, S. *et al. J. Exp. Med.* 24 Nov 2008 (doi:10.1084/jem.20081752)

Accelerated tumor growth in mice deficient in DNAM-1 receptor

Iguchi-Manaka, A. *et al. J. Exp. Med.* 24 Nov 2008 (doi:10.1084/jem.20081611)

DNAX accessory molecule 1 (DNAM1; also known as CD226) is an immunoglobulin superfamily protein that has previously been shown to have a role in $CD8^+$ T-cell- and natural killer (NK)-cell-mediated killing of tumour cells ***in vitro***. In these two reports, investigation of DNAM1-deficient mice confirms that this molecule is important for optimal tumour immunity ***in vivo***. The expression of DNAM1 ligands, CD155 and CD112, are commonly upregulated by tumours, and DNAM1-deficient mice could not control the growth of tumours that expressed these molecules owing to defective cytolytic killing of tumour cells. Gilfillan ***et al.*** show that DNAM1 expression is important for the activation of $CD8^+$ T cells by non-professional antigen-presenting cells (including tumour cells) and for NK-cell-mediated killing of tumour cells that are resistant to cytotoxicity.

IMMUNOTHERAPY

Targeting inside-out phosphatidylserine as a therapeutic strategy for viral diseases

Soares, M. M., King, S. W. & Thorpe, P. E. *Nature Med.* **14**, 1357–1362 (2008)

In this study the authors identified a new therapeutic strategy that is effective against several types of virus. They showed that phosphatidylserine is exposed on the surface of guinea pig cells infected with Pichinde virus (a model for Lassa fever virus), as well as cells infected with several other viruses, and is also found on the surface of Pichinde virions. Treatment of guinea pigs that were lethally infected with Pichinde virus with Bavituximab, a chimeric antibody that binds phosphatidylserine, resulted in the survival of 50% of the animals. This therapeutic effect seems to be due to the clearance of the virus from the bloodstream and the induction of antibody-dependent cytotoxicity of virus-infected cells. Bavituximab was also an effective treatment against lethal murine cytomegalovirus infection. So, targeting phosphatidylserine on the surface of infected cells and virions could be a valuable antiviral strategy.