Technology Offer

Reference Number
TO 03-00187

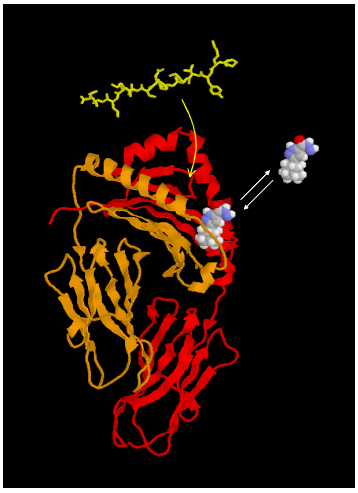
Catalysis of the Ligand Loading Process of MHC Molecules

The Challenge

The immune system is responsible to protect the organism against any invading harmful viruses or pathogenic organisms. The essential step for an efficient immune response is the presentation of the antigen to T-Cells via MHC Molecules by an antigen-presenting cell. As a result the organism initiates an adequate immune response by producing specific antibodies to antagonize the antigens or by triggering other cellular defence mechanisms.
The modern medicine has been trying to use this known mechanism for a long time to treat diseases by presenting specific MHC-bound antigens to T-Cells and thus to initiate a specific immune response. However, so far the limiting factor has been the rate of the ligand-exchange at the MHC Molecules, since the loading of class II MHC molecules is a extremely slow process and until now no catalyst could be identified to accelerate this step. Furthermore, older methods often used chemical compounds interfering with the native status of the proteins involved. Thus there is a strong demand to overcome or accelerate this limiting step to open new avenues in treating diseases by antigen specific immune therapies.

The Technology

Recently it has been shown, that the process of the ligand-exchange at MHC molecules, which is usually catalysed by the chaperon-like protein HLA-DM, can be accelerated by low-molecular compounds, such as adamantyl compounds. These novel catalysts overcome former disadvantages and allow efficient binding of peptides to MHC complexes in a physiological environment and under native conditions, increasing the MHC loading rate up to 300 times.
Thus this invention provides new possibilities in basic research applications, for improvement of diagnostic tools, as well as for the development of therapies for treating diseases such as cancer, autoimmune diseases or infections throughout antigen specific immune therapies.



Docking of MHC loading enhancers to MHC complexes *Source:* Falk & Rötzschke, 2005.

Commercial Opportunity

- In-licensing opportunity of know-how and IP
- Seeking for scientific collaboration

Patent Situation

An International Patent Application is pending.

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