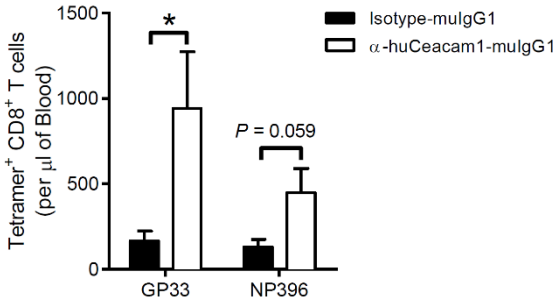
CEACAM1 antibodies for anti-viral therapy

Anti-CEACAM1 antibodies promote the anti-viral T cell response

Invention

Cytotoxic CD8-positive T cells constitute the crucial leukocyte subpopulation for a cellular response against viral infection. Since only very few direct anti-viral therapeutics are available, the stimulation of an efficient and specific immune response against a viral infection is a valid alternative or additional therapeutic approach. The first of such strategies has been established by use of high doses of interferon, which however has a high risk of adverse reactions of the immune system, and low response rates. Therefore, it is mandatory to search for further immune stimulatory strategies that more specifically induce an anti-viral T cell repsonse. The herein described approach is based on a antibody-mediated stimulation of the carcino-embryonic antigen-related cell adhesion molecule 1 (CEACAM1), which activates early parts of both the B cell and T cell receptor-induced signal transduction. The researchers have shown on the example of the lymphocytic choriomeningitis virus (LCMV) that these antibodies stimulate the activation and expansion of virus specific cytotoxic T cells, which comes along with a reduced virus load in serum and organs of mice. In vitro studies confirmed efficacy also against influenza virus and cytomegalovirus.



Mice expressing human Ceacam1 instead of murine Ceacam1 (huCeacam1+/+ × muCeacam1–/–) were treated with αhuCeacam1-mIgG1 or Isotype-mIgG1 on days -1 and day 3. Mice were infected with 2x104 PFU LCMV-Docile. Virus specific Tet-GP33+ and Tet-NP396+ CD8+ T cell numbers were analyzed in the blood on day 8

Commercial Opportunities

The monoclonal, humanized anti-CEACAM1 antibodies are offered for licensing and further therapeutic development.

Current Status

The researcher have conducted experiments with a LMCV-specific immune response mouse model. Further proof of principle with the humanized variant of the antibody has been provided by means of humanized CEACAM1 mice. The antibody activates human virus-specific CD8+ T cells in vitro. In case of interest we are pleased to inform you about the patent status.

Relevant Publications

Khainar, V. *et al.* (2018) CEACAM1 promotes CD8+ T cell responses and improves control of a chronic viral infection. *Nature Communications* 9:2561.

Khairnar, V. *et al.* (2015) CEACAM1 induces B-cell survival and is essential for protective antiviral antibody production. *Nature Communications* 6: 6217.

An invention of the University Duisburg-Essen.

Competitive Advantages

- Complementary anti-viral therapy option
- Applies to a broad range of viruses
- Specific immune response against specific viruses

Technology Readiness Level

1234**4**56789

Technology validated in lab

Industries

- Pharmaceutical Industry

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