Therapeutic Methods Based on In Vivo Modulation of the Production of Interferon gamma

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Technology description

Summary

The technology offered for licensing is in the field of Therapeutics. More specifically, the technology relates to biological ligands and their use as modulators of the production of Interferon gamma as a means to treat a broad spectrum of diseases. The invention describes and claims antibodies and other ligands that can stimulate Natural Killer (NK) immune cells to produce Interferon gamma which contributes to the combat against foreign pathogens. Conversely, the invention also describes and claims methods that can inhibit such Interferon gamma production for treatment of diseases where excess of Interferon is not desirable. The invention also describes methods and assays to identify both inducing and inhibiting ligands.
Interferon-gamma is a potent antiviral and antimicrobial substance produced by natural killer (NK) white blood cells. NK cells are activated during infections by viruses and by other intracellular pathogens, such as parasites and bacteria. Soluble substances, such as interleukins, produced by infected cells activate NK cells to secrete interferon-gamma. Injection of interleukins into patients to stimulate NK cells to secrete interferon-gamma has not been a successful therapeutic approach because of the toxicity involved. The invention is based on the discovery by the inventors that activation of the KIR2DL4 receptor expressed by all NK cells stimulates them to produce interferon-gamma. The invention claims monoclonal antibodies and derivatives thereof, as well as natural and synthetic ligands of KIR2DL4 that can be utilized to stimulate interferon-gamma production by NK cells without any other stimulus. The possibility of inducing interferon-gamma production by NK cells without the toxic side effects of interleukins could be an effective therapy for various types of infections and of cancers. Also claimed in the invention are methods of treating various cancers and viral infections, methods of treating autoimmune disease, and methods of administration of the antibody or derivatives thereof. Certain diseases benefit from reduction in the amount of Interferon gamma. The instant invention claims such ligands that are capable of inhibiting KIR2DL4 from producing interferon gamma. It also describes methods of identifying such ligands.
Market
The technology lends itself to treatment of viral and microbial-caused infectious disease and possibly

as therapy for certain cancers and autoimmune disease. Collectively, these medical areas represent a huge market of multi billion dollars and thus significant commercial opportunities.

Application area

Therapeutics of infectious diseases, cancer and autoimmune diseases
The mAbs can be used as research reagents

Advantages

Absence of toxicity as compared with current methods such as IL-2 treatment.

Institution

NIH - National Institutes of Health

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