Brand Name: Pegasys
Generic: peginterferon α
Type: monoclonal antibody
Year Accepted/Phase: 2002

Mechanism:

Peginterferon alfa-2a (Pegasys) works by binding to interferon-alpha receptors on immune cells, activating the JAK-STAT signaling pathway. This leads to the phosphorylation and dimerization of STAT proteins, which then move to the nucleus to promote the transcription of interferon-stimulated genes (ISGs). These genes encode proteins that interfere with viral replication by inhibiting viral protein synthesis, degrading viral RNA, and enhancing the immune response to clear infected cells. This multifaceted antiviral action helps control hepatitis B and C infections.

Chemical Structure: N/A

Indication:

Pegasys is indicated for the treatment of chronic hepatitis B and C infections, as well as certain cancers, such as melanoma and certain types of leukemia.

Clinical trials:

Hepatitis C Trials

Purpose: Evaluate the efficacy of Pegasys in treating chronic hepatitis C infection.
Dates: Trials conducted from the late 1990s onwards.
Results: Pegasys, either alone or in combination with ribavirin, was shown to be more effective than previous standard treatments for hepatitis C. It significantly increased the rates of sustained virological response (SVR), indicating clearance of the hepatitis C virus, in patients with both genotypes 1 and 2/3.
Impact: These trials led to the approval of Pegasys for the treatment of chronic hepatitis C infection.

Hepatitis B Trials

Purpose: Evaluate the efficacy of Pegasys in treating chronic hepatitis B infection.
Dates: Trials conducted from the early 2000s onwards.
Results: Pegasys was shown to be effective in reducing hepatitis B viral load and improving liver function in patients with chronic hepatitis B. It also increased the rates of hepatitis B e antigen (HBeAg) seroconversion, indicating a reduction in viral replication.
Impact: These trials supported the use of Pegasys for the treatment of chronic hepatitis B infection.

Cancer Trials

Purpose: Evaluate the efficacy of Pegasys in treating certain cancers, such as melanoma and certain types of leukemia.
Dates: Trials conducted from the mid-2000s onwards.
Results: Pegasys, either alone or in combination with other cancer treatments, showed promising results in the treatment of certain cancers. It demonstrated antiproliferative and immunomodulatory effects that were beneficial in slowing tumor growth and improving survival rates in some patients.
Impact: While Pegasys is not a first-line treatment for cancer, these trials have highlighted its potential as an adjuvant therapy in certain cancer types.