3. THYMUS 3

A. THYMUS 3 as Complementary Therapy in Cancer

Lymphocyte T is a component in cellular immune system which matures in the thymus gland. The thymus gland contains thymic hormones that control the maturation, development and antigen commitment of T lymphocytes. The thymus gland belongs to mammalian and involutes after puberty affecting T lymphocyte maturation and ending in immunosuppression in adults. Cellular immune response depletion is associated with poor prognosis in cancer. It influences cancer growth and metastasis.[1] Based on this reason, the use of thymus gland extract as complementary therapy to increase cellular immune system has beneficial effect for cancer patients.[2]

THYMUS 3 is thymus gland extract that stimulates T lymphocyte maturation and develops cellular immune response activation against cancer cells.

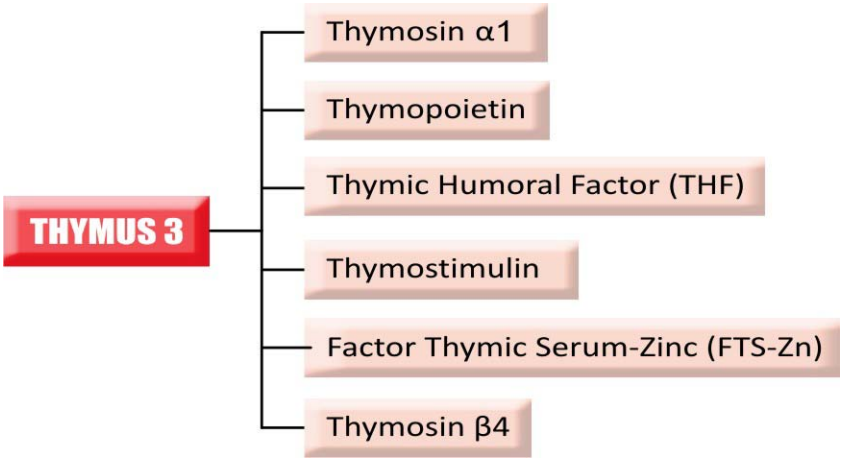

Fig.11. Bioactive Substances in THYMUS 3

Studies showed that a thymic hormone known as Thymosin α1 (Tα1) was able to inhibit proliferation and stimulate apoptosis of human leukemic cell lines (HL-60, K562 and K562/ADM).[3] Tα1 administration concomitant with Transarterial Chemoembolization (TACE) in Hepatocellular Carcinoma (HCC) patients resulted in higher survival rate compared to patients who were only treated with TACE.[4] The other thymic hormone, thymostimulin (TP1), is able to neutralize p15E-like factor secreted by head and neck squamous cell carcinoma. P15E-like factor is an immunosuppressive factor that inhibits monocyte chemotactic capability.[5]

B. THYMUS 3 as a Complementary Therapy in Hepatitis B and C

Viral Hepatitis B and C (HBV and HCV) generally proceed to chronic hepatitis, fibrosis, cirrhosis and even liver cancer (hepatocellular carcinoma/HCC). Until today, standard therapies for viral hepatitis infection are Interferon-α (IFN-α) and nucleoside analog (anti-viral), but both of them only reach low rates of efficacy. In addition, the

long term use of analog nucleoside can exert resistance because HBV or HCV are known to have high mutation rate.

Tα1 is a thymic hormone that stimulates T lymphocyte maturation and activation. Lymphocyte T-mediated immune response is important in viral hepatitis elimination. A clinical study shows that Tα1 treatment in chronic hepatitis B patient for 6 months results in sustained response until 12 months follow up compared to patients treated with IFN-α. Reduction of HBeAg and HBV DNA in Tα1-treated patients at the end of therapy (6 months) is lower than IFN-α, but at the end of follow up (12 months) reduction of HBeAg and HBV DNA in Tα1-treated patients is higher than IFNα. Delayed response exerted by Tα1 may be due to its activity and is not likely a direct antiviral effect which competes with viral nucleoside. However, it stimulates host cellular immune response in viral hepatitis elimination through noncytolytic viral clearance mechanism.[6]

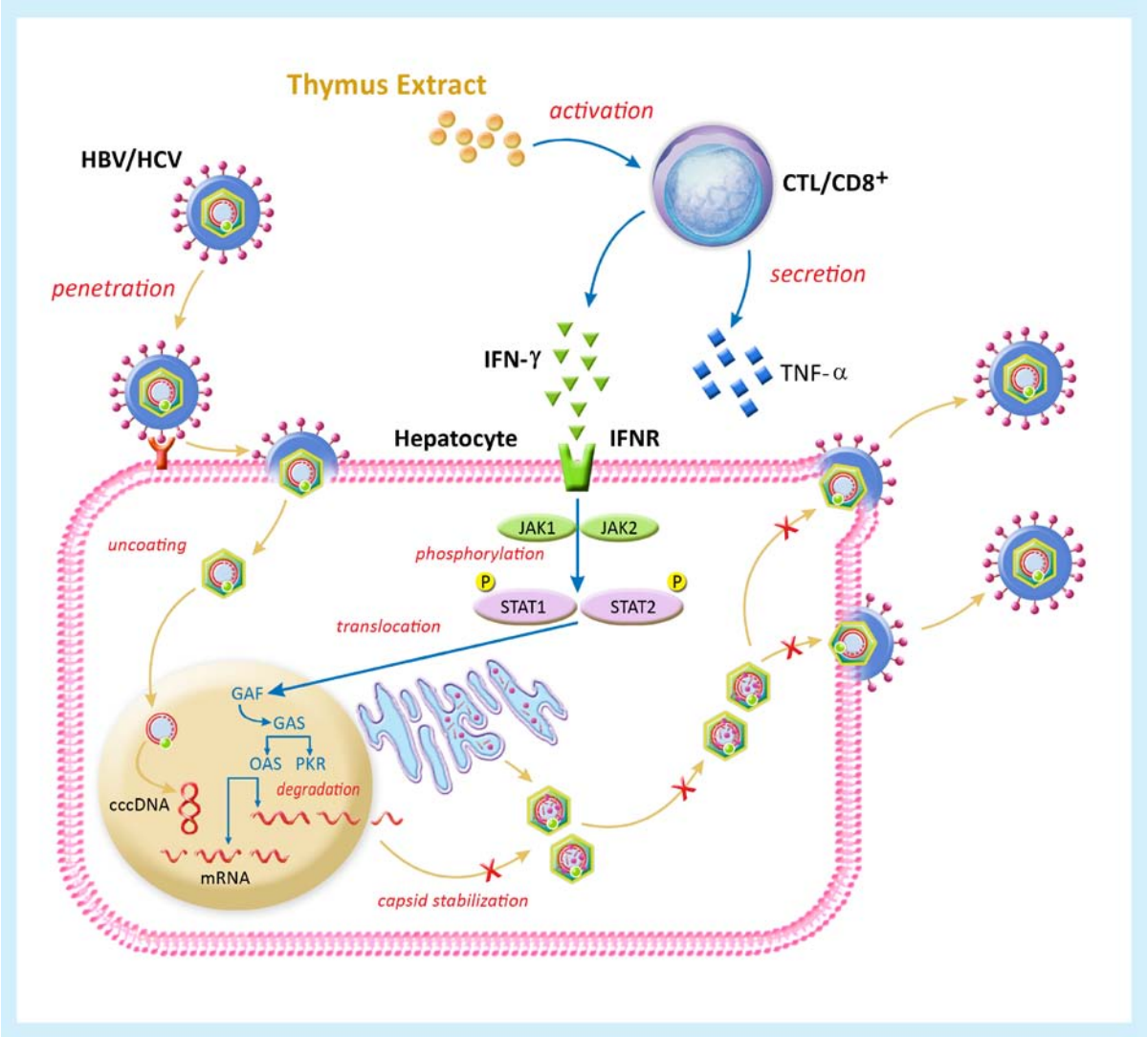

Fig.12. Inhibition of Viral Hepatitis Replication by Thymus Extract