

Note: This paper should be typed in “Times New Roman” of 12pt.

Presentation Title(Should be no more than 20 words):

**Immunomodulatory Drugs of Natural Origin: In Vitro, In Vivo, and
Clinical Study**

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Abstract :

According to the Christian belief; gold, frankincense, and myrrh were the three gifts from the wise men (the Magi, or the three kings) brought from the East to celebrate the birth of baby Jesus Christ (Bible, Matthew 2:11). The immunomodulatory and antiviral bioassay-guided fractionation of the oleogum resin of frankincense (*Boswellia carterii* Birdwood) resulted in the isolation and identification of 9 compounds. Biologically, both oil and resins exhibited strong immunostimulant activity (90% lymphocyte transformation). The antiviral assay of boswellia, curcumin, and glycyrrhizin proved that boswellic acids mixture showed the highest activity against *Herpes simplex* Type I (100 % inhibition at 20 µg/ml), glycyrrhizin (75% inhibition at 20 µg/ml), and curcumin (50% inhibition at 40 µg/ml). The combination of boswellic acids with curcumin was clinically evaluated for treatment of knee osteoarthritis. Moreover the combination of glycyrrhizin, curcumin and *Boswellia carterii* proved to exhibit a hepatoprotective effect and used as endogenous inteferon inducer, demonstrating that two phases of the induction of IFN in serum takes place; the induced IFN was regarded as IFN-g. This induction may be followed by activation of macrophages and augmentation of natural killer (NK) activity through the action of the induced IFN. This combination was successfully tried in a clinical study as endogenous interferon inducer for treatment of hepatitis C.