Claims

1. A method of determining or comparing potency of a test interferon relative to Recombinant Super-Compound Interferon (rSIFN-co), or establishing equivalence between a test interferon and rSIFN-co, comprising:

(1) providing the test interferon and rSIFN-co; and

(2) determining down-regulation of expression of LRP6 and FZD6 in HT-29 cells by the test interferon and rSIFN-co, *in vitro,* under same specified conditions, respectively;

whereby the presence of down-regulation of expression of LRP6 and FZD6 in HT-29 cells in a statistically significant manner by the test interferon, signifies that the test interferon and rSIFN-co have the same potency, or that the test interferon and rSIFN-co are equivalent.

2. The method of claim 1, wherein under step (2) any one or more of the following activities are further determined:

(a) Inhibition of in vivo cancer cell growth in any one or more tumor-bearing mouse models;

(b) Reduction in cancer cell viability;

(c) Inhibition of cancer cell migration;

(d) Inhibition of beta-catenin/TCF transcriptional activity in cancer cells;

(f) Inhibition of expression of any one or more of: Axin2, CD24, Survivin and ID2 in cancer cells;

(g) Inhibition of pseudopod formation in cancer cells;

(h) Inhibition of beta-catenin expression in cancer cells; and

(i) Up-regulation of expression of any one or more of: DKK-3, KLF-4, and BATF2 in cancer cells;

whereby activities (b) to (i) are determined under *in vitro* conditions, and the presence of down-regulation of expression of LRP6 and FZD6 in HT-29 cells by the test interferon, in combination with the activity specified in (f) in a statistically significant manner, and/or any 1, or 2, or 3, or 4 of the activities specified in (a), (b), (c), and (d)

in a statistically significant manner, and/or the presence in the test interferon of any one or more of the activities specified in (g), (h) and (i), further signifies that the test interferon and rSIFN-co have the same potency, or that the test interferon and rSIFN-co are equivalent.

3. The method of claims 1 or 2, wherein the cancer cells employed in determining one or more activities comprise any one or more of: lung cancer cells, colon cancer cells, cervical cancer cells, liver cancer cells, breast cancer cells, and pancreatic cancer cells.

4. The method of any one of claims 1-3, wherein the cancer cells employed in determining one or more activities comprise any one or more of: A549 cells, Hela cells, CL-1 cells, Huh-7 cells, SW480 cells, MDA-MB-231 cells, Calu-1 cells, SMMC-7721 cells, PANC-1 cells, SW620 cells, SPC-A4 cells, H1299 cells, H460 cells, and HT-29 cells.

5. The method of any one of claims 1 – 4, wherein statistical significance means a p value of less than or equal to 0.05, or less than or equal to 0.01, or less than or equal to 0.005, or less than or equal to 0.001, or less than or equal to 0.0005, or less than or equal to 0.0001, when compared to a control.

6. The method of any one of claims 1 – 5, wherein the control is not treated with the test interferon or rSIFN-co , or is treated with normal saline or PBS, or is treated with IFNα-2b, or the control is untreated control (Mock).

7. The method of any one of claims 1-6, wherein the amino acid sequence of the test interferon is at least 90%, optionally, at least 95%, 96%, 97%, 98%, 99%, 100% identical to that of rSIFN-co (SEQ ID NO: 1).

8. The method of any one of claims 1-7, wherein the test interferon and rSIFN-co have same amino acid sequence (SEQ ID NO: 1) and are encoding by same nucleotide sequence (SEQ ID NO: 2).

9. The method of any one of claims 1-8, wherein the test interferon and rSIFN-co have the same specific activity.