We claim,

1. A method of achieving mammalian energy balance using forskolin in a process of adipogenesis inhibition, wherein forskolin is added separately to pre-adipocytes before differentiation and also to mature adipocytes to comparatively evaluate adipogenesis inhibition potential, said process comprising steps of:

a) Seeding mammalian adipocyte precursor cells (pre-adipocytes) in wells of microplates, wherein approximately 60×10^4 cells are seeded for 48-72 hours to get 70-80% confluence;

b) Adding forskolin at concentrations of 50 µg/ml and 100 µg/ml in the pre-seeded microplates of step a consisting of undifferentiated pre-adipocytes;

c) Adding 200 µl of freshly prepared Adipogenesis induction medium to the wells;

d) Adding 200 µl of freshly prepared Adipogenesis progression medium after 72 hours of incubation with the Adipogenesis induction medium in step c;

e) Incubating the cells treated with forskolin (step b), adipogenesis induction medium (step c) and adipogenesis progression medium (step d) for 48 hours in a humidified atmosphere (37 deg. C.) of 5% CO2 and 95% air;

f) Fixing the cells of step e by adding 100 µl of 10% formalin and staining using the Oil Red O technique;

g) Reading the optical density of cells of step f at 492 nm in a microplate reader and expressing the results as inhibitory concentration (IC50) values using the graph pad prism software;

h) Calculating the percentage inhibition of adipogenesis in the cells of steps f and g using the formula, C-T/T×100, wherein C is the absorbance of Oil Red O in differentiating/undifferentiated cells and T is the absorbance of Oil Red O in sample treated differentiating/undifferentiated cells;

i) Adding 200 µl of freshly prepared Adipogenesis induction medium to the wells of step a;

j) Adding 200 µl of freshly prepared Adipogenesis progression medium comprising graded concentrations of forskolin(50µg/ml and 100µg/ml respectively) to the wells of step i after 72 hours of incubation with the Adipogenesis induction medium;

k) Incubating the cells treated with forskolin (step j), adipogenesis induction medium (step i) and adipogenesis progression medium (step j) for 48 hours in a humidified atmosphere (37 deg. C.) of 5% CO2 and 95% air;

l) Fixing the cells of step k by adding 100 µl of 10% formalin and staining using the Oil Red O technique;

m) Reading the optical density of cells of step l at 492 nm in a microplate reader and expressing the results as inhibitory concentration (IC50) values using the graph pad prism software;

n) Calculating the percentage inhibition of adipogenesis in the cells of steps l and m using the formula, C-T/T×100, wherein C is the absorbance of Oil Red O in differentiating/undifferentiated cells and T is the absorbance of Oil Red O in sample treated differentiating/undifferentiated cells; and

o) Comparing percentage inhibition of adipogenesis in the cells of steps h and n.

2. A method of mammalian energy balance using forskolin in a process of promoting the expression of secreted factors that selectively recruit brown adipose tissue (BAT) like bone morphogenetic protein-7 (BMP-7), bone morphogenetic protein-4 (BMP-4), vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1), wherein said expression of secreted factors that selectively recruit brown adipose tissue (BAT) is remarkably enhanced as measured when forskolin is administered (brought into contact) to pre-adipocytes than to mature adipocytes, said method incorporating the steps of,

a) Seeding mammalian adipocyte precursor cells (pre-adipocytes) in wells of microplates wherein approximately 60×104 cells are seeded for 48-72 hours to get 70-80% confluence;

b) Adding forskolin at concentrations of 50 µg/ml and 100 µg/ml in the pre-seeded microplates of step a consisting of undifferentiated pre-adipocytes;

c) Adding 200 µl of freshly prepared Adipogenesis induction medium to the wells;

d) Adding 200 µl of freshly prepared Adipogenesis progression medium after 72 hours of incubation with the Adipogenesis induction medium in step c;

e) Incubating the cells treated with forskolin (step b), adipogenesis induction medium (step c) and adipogenesis progression medium (step d) for 48 hours in a humidified atmosphere (37 deg. C.) of 5% CO2 and 95% air;

f) Quantitatively determining by appropriate immunoassay techniques the expressions of BMP-7, BMP-4, VEGF-A and UCP-1 in the cell supernatant;

g) Adding 200 µl of freshly prepared Adipogenesis induction medium to the wells of step a;

h) Adding 200 µl of freshly prepared Adipogenesis progression medium comprising graded concentrations of forskolin (50µg/ml and 100µg/ml respectively) to the wells of step g after 72 hours of incubation with the Adipogenesis induction medium;

i) Incubating the cells treated with forskolin (step h), adipogenesis induction medium (step g) and adipogenesis progression medium (step h) for 48 hours in a humidified atmosphere (37 deg. C.) of 5% CO2 and 95% air; and

j) Quantitatively determining by appropriate immunoassay techniques the expressions of BMP-7, BMP-4, VEGF-A and UCP-1 in the cell supernatant.

3. Forskolin for use in achieving energy balance in mammalian adipose cellular systems by administering forskolin in effective amounts targeted towards mammalian pre-adipocytes to achieve effects of (a) increased inhibition of adipogenesis and (b) increased expression of secretory factors that function individually or in combination to specifically recruit brown adipocytes or brown like (beige or brite) adipocytes.

4. The use according to claim 3 wherein the secretory factors are selected from the group consisting of bone morphogenetic protein-7 (BMP-7), bone morphogenetic protein-4 (BMP-4), vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1).

5. Use of effective amounts of forskolin in the manufacture of a medicament for achieving energy balance in mammalian adipose cellular systems, wherein the medicament is to be administered towards mammalian pre-adipocytes to achieve effects of (a) increased inhibition of adipogenesis and (b) increased expression of secretory factors that function individually or in combination to specifically recruit brown adipocytes or brown like (beige or brite) adipocytes

6. Forskolin for use in therapy for obesity, wherein said therapy involves achieving energy balance in mammalian adipocytes by administering forskolin in effective amounts targeted towards mammalian pre-adipocytes to bring about the effects of (a) increased inhibition of adipogenesis and (b) increased expression of secretory factors that function individually or in combination to specifically recruit brown adipocytes or brown like (beige or brite) adipocytes.

7. The use according to claim 6 wherein the secretory factors are selected from the group consisting of bone morphogenetic protein-7 (BMP-7), bone morphogenetic protein-4

(BMP-4), vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1).

8. Use of effective amounts of forskolin in the manufacture of a medicament for the treatment of obesity, wherein the medicament is to be administered towards mammalian pre-adipocytes to bring about the effects of (a) increased inhibition of adipogenesis and (b) increased expression of secretory factors that function individually or in combination to specifically recruit brown adipocytes or brown like (beige or brite) adipocytes.

9. Forskolin in use for inducing brown like phenotype (beige or brite adipocytes) in white adipocyte depots in mammals by administering effective amount of forskolin to obese mammals with depots of fully differentiated white adipocytes to achieve effect of increase in secretory factors that bring about the development of brown like phenotype (beige or brown adipocytes) within white adipocyte depots.

10. The use according to claim 9 wherein the secretory factors are vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1).

11. Use of an effective amount of forskolin in the manufacture of a medicament for inducing brown like phenotype (beige or brite adipocytes) in white adipocyte depots in mammals, wherein the medicament is to be administered to obese mammals with depots of fully differentiated white adipocytes to achieve effect of increase in secretory factors that bring about the development of brown like phenotype (beige or brown adipocytes) within white adipocyte depots.

12. Forskolin for use in the therapy of obesity characterised in that forskolin is administered in effective amounts targeting mammalian white adipocyte depots to achieve effect of increased expression of secretory factors vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1) that cause the development of brown like phenotype (beige or brite adipocytes) in white adipocyte depots in mammals.

13. Use of effective amounts of forskolin in the manufacture of a medicament for the treatment of obesity, wherein the medicament is to be administered to mammalian white adipocyte depots to achieve effect of increased expression of secretory factors vascular endothelial growth factor-A (VEGF-A) and mitochondrial uncoupling protein (UCP1) that cause the development of brown like phenotype (beige or brite adipocytes) in white adipocyte depots in mammals.

14. Forskolin for use in achieving energy balance in mammalian adipose cellular systems by administering forskolin in effective amounts targeted towards mammalian pre-adipocytes to bring about enhanced expression of mitochondria uncoupling protein 1 (UCP-1) to result in increased mitochondrial thermiogenesis in differentiated brown adipocytes and brown like (beige or brite) adipocytes.

15. Use of effective amounts of forskolin in the manufacture of a medicament for achieving energy balance in mammalian adipose cellular systems, wherein the medicament is to be administered towards mammalian pre-adipocytes to bring about enhanced expression of mitochondria uncoupling protein 1 (UCP-1) to result in increased mitochondrial thermiogenesis in differentiated brown adipocytes and brown like (beige or brite) adipocytes.

16. Forskolin for use in therapy for obesity wherein said therapy involves achieving energy balance in mammalian adipocytes by administering forskolin in effective amounts targeted towards mammalian pre-adipocytes to bring about the effects of enhanced expression of secretory factor mitochondria uncoupling protein 1 (UCP-1) to result in increased mitochondrial thermiogenesis in differentiated brown adipocytes and brown like (beige or brite) adipocytes.

17. Use of effective amounts of forskolin in the manufacture of a medicament for the treatment of obesity, wherein the medicament is to be administered towards mammalian pre-adipocytes to bring about the effects of enhanced expression of secretory factor mitochondria uncoupling protein 1 (UCP-1) to result in increased mitochondrial thermiogenesis in differentiated brown adipocytes and brown like (beige or brite) adipocytes.