6. The use of any one of claims 1 to 5, wherein the subject has underwent anticancer therapy with a different anticancer agent or anticancer agent combination prior to administration of the compound of Formula I.

7. The use of claim 6, wherein the subject has previously been treated with an anticancer agent selected from the group of selective estrogen receptor modulators, estrogen receptor down regulators, aromatase inhibitors, HER2 inhibitors, anthracyclines, and combinations thereof.

8. The use of claim 7, wherein the anticancer agent is selected from the group consisting of doxorubicine, paclitaxel, herceptin, lapatinib, gefitinib, erlotinib, tamoxifen, fulvestrant, anastrazole, lectrozole, exemestane, fadrozole and combinations thereof.

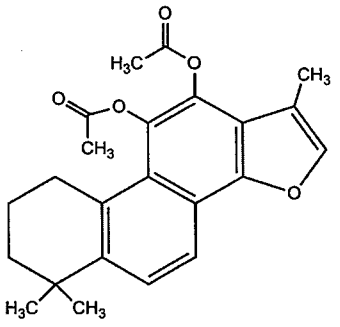
9. The use of any one of claims 6 to 8, wherein the subject has failed the previous therapy.

10. The use of claim 9, wherein the subject has developed resistance to one or more of the previously administered anticancer agents.

11. The use of any one of claims 1 to 10, wherein the subject is a mammal.

12. The use of claim 11, wherein the subject is a human.

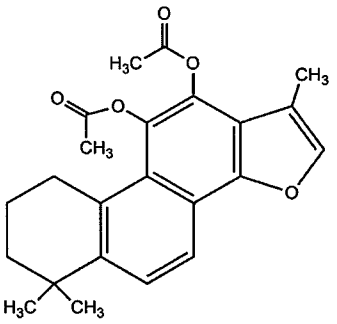
13. ~~Method~~ *In vitro* method for inhibiting estrogen receptor signaling in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

14. The method of claim 13, wherein estrogen receptor signaling is inhibited by estrogen receptor protein degradation, reduced estrogen receptor mRNA levels and/or inhibition of estrogen receptor-responsive gene expression.

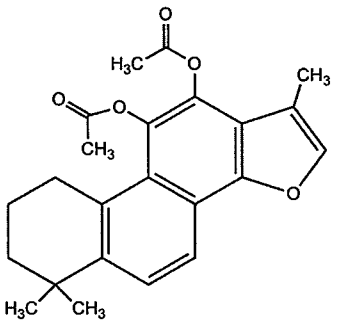
15. *In vitro* m~~M~~ethod for reducing HER2 expression in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

16. The method of claim 15, wherein the cell is an estrogen receptor positive/HER2 positive (ER+/HER2+) cancer cell including a breast cancer cell.

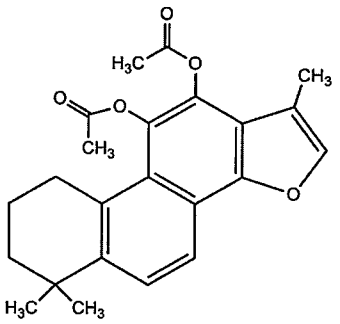
17. *In vitro* m~~M~~ethod for inducing apoptosis in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

18. The method of claim 17, wherein apoptosis is induced by generation of reactive oxygen species.

~~19. Method for treating or preventing cancer in a subject, comprising administering an effective amount of a compound of Formula I to a subject in need thereof.~~



~~Formula I~~

~~20.The method of claim 19, wherein the cancer is selected from breast cancer, cervical cancer, lung cancer, liver cancer, colorectal adenocarcinoma, neuroblastoma, melanoma, and leukemia.~~

~~21.The method of claim 19 or 20, wherein the cancer is estrogen receptor-positive (ER+) breast cancer.~~

~~22.The method of any one of claims 19 to 21, wherein the cancer is HER2 positive (HER2+) cancer including breast cancer.~~

~~23.The method of any one of claims 19 to 22, wherein the method further comprises administering a second anticancer agent to the subject.~~

~~24.The method of claim 23, wherein the second anticancer agent is administered before, together with or after the compound of Formula I.~~

~~25.The method of claim 23 or 24, wherein the second anticancer agent is selected from the group consisting of paclitaxel, doxorubicin, herceptin, lapatinib, gefitinib,~~

~~erlotinib, tamoxifen, fulvestrant, anastrazole, lectrozole, exemestane, fadrozole and combinations thereof.~~

~~26. The method of any one of claims 19 to 25, wherein the subject has prior to administration of the compound of Formula I underwent anticancer therapy with a different anticancer agent or anticancer agent combination.~~

~~27. The method of claim 26, wherein the subject has previously been treated with an anticancer agent selected from the group of selective estrogen receptor modulators, estrogen receptor down regulators, aromatase inhibitors, HER2 inhibitors, anthracyclines, and combinations thereof.~~

~~28. The method of claim 27, wherein the anticancer agent is selected from the group consisting of doxorubicine, paclitaxel, herceptin, lapatinib, gefitinib, erlotinib, tamoxifen, fulvestrant, anastrazole, lectrozole, exemestane, fadrozole and combinations thereof.~~

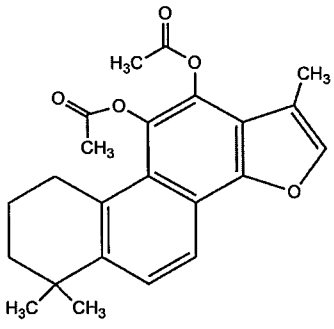
~~29. The method of any one of claims 26 to 28, wherein the subject has failed the previous therapy.~~

~~30. The method of claim 29, wherein the subject has developed resistance to one or more of the previously used anticancer agents.~~

~~31. The method of any one of claims 19 to 30, wherein the subject is a mammal.~~

~~32. The method of claim 31, wherein the subject is a human.~~

~~33~~19. Method for the synthesis of a compound of Formula I



Formula I

comprising:

(a) adding tanshinone IIA (1,6,6-trimethyl-8,9-dihydro-7H-naphtho[1,2-g][1]benzofuran-10,11-dione), an acetate salt and anhydrous zinc powder to acetic anhydride to provide a reaction mixture;

(b) heating the reaction mixture;

(c) filtrating the reaction mixture to remove insoluble residues;

(d) adding water to the filtrate and heating the resulting solution;

(e) filtering the resulting solution to obtain the compound of Formula I as a solid.

~~34.~~20. The method of claim ~~33~~19, wherein the acetate salt is alkali metal acetate.

~~35~~21. The method of claim ~~33-~~19 or ~~34~~20, wherein step (b) comprises heating to about 100 °C for about 3 hours.

~~36~~22. The method of any one of claims ~~33-~~19 to ~~35~~21, wherein step (d) comprises heating to about 100 °C.

~~37.~~23. The method of any one of claims ~~33-~~19 to ~~36~~22, wherein the method further comprises the recrystallizing the solid product in 95% ethanol.

6. The use of any one of claims 1 to 5, wherein the subject has underwent anticancer therapy with a different anticancer agent or anticancer agent combination prior to administration of the compound of Formula I.

7. The use of claim 6, wherein the subject has previously been treated with an anticancer agent selected from the group of selective estrogen receptor modulators, estrogen receptor down regulators, aromatase inhibitors, HER2 inhibitors, anthracyclines, and combinations thereof.

8. The use of claim 7, wherein the anticancer agent is selected from the group consisting of doxorubicine, paclitaxel, herceptin, lapatinib, gefitinib, erlotinib, tamoxifen, fulvestrant, anastrazole, lectrozole, exemestane, fadrozole and combinations thereof.

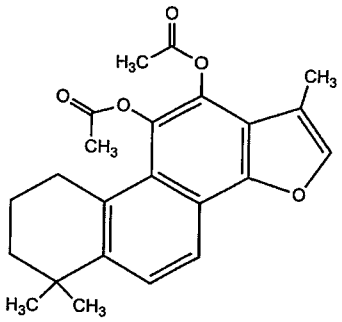
9. The use of any one of claims 6 to 8, wherein the subject has failed the previous therapy.

10. The use of claim 9, wherein the subject has developed resistance to one or more of the previously administered anticancer agents.

11. The use of any one of claims 1 to 10, wherein the subject is a mammal.

12. The use of claim 11, wherein the subject is a human.

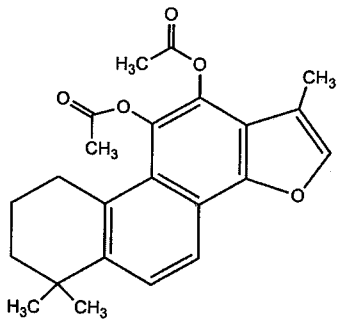
13. *In vitro* method for inhibiting estrogen receptor signaling in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

14. The method of claim 13, wherein estrogen receptor signaling is inhibited by estrogen receptor protein degradation, reduced estrogen receptor mRNA levels and/or inhibition of estrogen receptor-responsive gene expression.

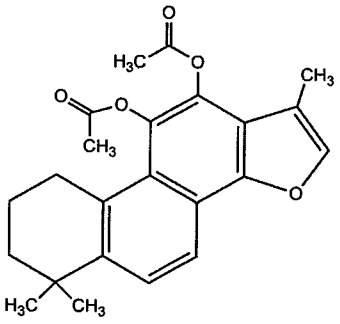
15. *In vitro* method for reducing HER2 expression in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

16. The method of claim 15, wherein the cell is an estrogen receptor positive/HER2 positive (ER+/HER2+) cancer cell including a breast cancer cell.

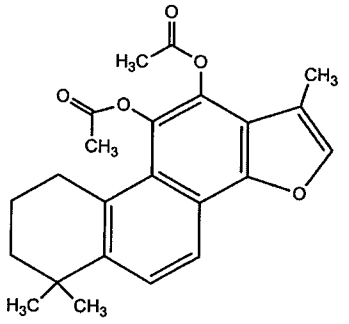
17. *In vitro* method for inducing apoptosis in a cell, comprising contacting said cell with an effective amount of a compound of Formula I.



Formula I

18. The method of claim 17, wherein apoptosis is induced by generation of reactive oxygen species.

19. Method for the synthesis of a compound of Formula I



Formula I

comprising:

(a) adding tanshinone IIA (1,6,6-trimethyl-8,9-dihydro-7H-naphtho[1,2-g][1]benzofuran-10,11-dione), an acetate salt and anhydrous zinc powder to acetic anhydride to provide a reaction mixture;

(b) heating the reaction mixture;

(c) filtrating the reaction mixture to remove insoluble residues;

(d) adding water to the filtrate and heating the resulting solution;

(e) filtering the resulting solution to obtain the compound of Formula I as a solid.

20. The method of claim 19, wherein the acetate salt is alkali metal acetate.

21. The method of claim 19 or 20, wherein step (b) comprises heating to about 100 °C for about 3 hours.

22. The method of any one of claims 19 to 21, wherein step (d) comprises heating to about 100 °C.

23. The method of any one of claims 19 to 22, wherein the method further comprises the recrystallizing the solid product in 95% ethanol.