

~~What is claimed is:~~ Claims

1. A method of selecting a subject determined to have a metastatic tumor with a mutation in homologous recombination pathway genes, for treatment with talazoparib, or a pharmaceutically acceptable salt thereof, comprising a) determining a homologous recombination deficiency score from a biopsy of the metastatic tumor; and b) selecting the subject for treatment with talazoparib, or a pharmaceutically acceptable salt thereof, if the homologous recombination deficiency score is at least 33%, wherein the mutation is not germline BRCA1 or germline BRCA2.

~~2. The method of claim 1, further comprising administering talazoparib, or a pharmaceutically acceptable salt thereof, to the selected patient.~~

~~3.2.~~ The method of claim 1 ~~or claim 2~~, wherein the mutation is a somatic or a germline mutation.

~~4.3.~~ The method of claim 1 ~~or claim 2~~, wherein the mutation is PALB2, CHEK2, ATM, BRIP1, RAD50, ATR, PTEN, or FANCA.

~~5.4.~~ The method of claim 1 ~~or claim 2~~, wherein the mutation is gCHEK2, gPALB2, or sPTEN.

~~6.5.~~ The method of claim 1 ~~or claim 2~~, wherein the mutation is gPALB2.

~~7.6.~~ The method of claim 1, wherein the metastatic tumor is a breast tumor.

~~8.7.~~ The method of claim ~~7~~6, wherein the breast tumor is a HER2-negative breast tumor.

~~9.8.~~ The method of claim 1, wherein the metastatic tumor is determined to have a mutation in homologous recombination pathway genes by next generation sequencing.

~~10.9.~~ The method of claim 1, wherein the step of determining a homologous recombination deficiency score from a biopsy of the metastatic tumor is performed by next generation sequencing.

~~11.10.~~ The method of claim 1, wherein the homologous recombination deficiency score is at least 42%.

12.11. Use of talazoparib, or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for the treatment of ~~A method of treating a metastatic tumor in a subject determined to have a mutation in homologous recombination pathway genes, wherein comprising a) determining a homologous recombination~~

deficiency score from a biopsy of the metastatic tumor; and b) administering talazoparib, or a pharmaceutically acceptable salt thereof, is to be administered to the subject if the homologous recombination deficiency score determined from a biopsy of the metastatic tumor is at least 33%, wherein the mutation is not germline BRCA1 or germline BRCA2.

13.12. The ~~method use~~ of claim 1211, wherein the mutation is a somatic or a germline mutation.

14.13. The ~~method use~~ of claim 1211 or claim 1312, wherein the mutation is PALB2, CHEK2, ATM, BRIP1, RAD50, ATR, PTEN, or FANCA.

15.14. The ~~method use~~ of claim 1211 or claim 1312, wherein the mutation is gCHEK2, gPALB2, or sPTEN.

16.15. The ~~use method~~ of claim 1211 or claim 1312, wherein the mutation is gPALB2.

17.16. The ~~use method~~ of claim 1211, wherein the metastatic tumor is a breast tumor.

18.17. The ~~use method~~ of claim 1716, wherein the breast tumor is a HER2-negative breast tumor.

19.18. The ~~use method~~ of claim 1211, wherein the metastatic tumor is determined to have a mutation in homologous recombination pathway genes by next generation sequencing.

20.19. The ~~use method~~ of claim 1211, wherein the ~~step of determining a~~ homologous recombination deficiency score from a biopsy of the metastatic tumor is performed by next generation sequencing.

21.20. The ~~use method~~ of claim 1211, wherein the homologous recombination deficiency score is at least 42%.