

protein level) and the sensitivity of the tumors to PARP inhibitor treatment.

[0006a] In one aspect of the present disclosure, there is provided a use of a PARP inhibitor in the manufacture of a medicament for treating small cell lung cancer in a subject, wherein the subject is a human identified as expressing SLFN11.

[0006b] In another aspect of the present disclosure, there is provided a use of a PARP inhibitor in the manufacture of a medicament for treating a small cell lung cancer subject, wherein SLFN11 is to be detected in a tumor cell sample from the subject.

[0006c] In yet another aspect of the present disclosure, there is provided a method of selecting a small cell lung cancer subject for PARP inhibitor chemotherapy, wherein SLFN11 is to be detected in a small cell lung cancer tumor sample of the subject, and an effective amount of a PARP inhibitor is to be administered to the subject.

[0006d] In a further aspect of the present disclosure, there is provided a use of talazoparib or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating small cell lung cancer in a subject identified as expressing SLFN11.

[0007] Thus, the present disclosure includes methods of treating a SLFN11-, SIL1-, SLC25A3-, MAF-, AP3B1-, C1orf50-, BCL2-, DDX6-, and/or GULP1-positive SCLC patient comprising administering to the patient an effective amount of a PARP inhibitor. The

CLAIMS

1. Use of a PARP inhibitor in the manufacture of a medicament for treating small cell lung cancer in a subject, wherein the subject is a human identified as expressing SLFN11.
2. Use of a PARP inhibitor in the manufacture of a medicament for treating a small cell lung cancer subject, wherein SLFN11 is to be detected in a tumor cell sample from the subject.
3. A method of selecting a small cell lung cancer subject for PARP inhibitor chemotherapy, wherein SLFN11 is to be detected in a small cell lung cancer tumor sample of the subject, and an effective amount of a PARP inhibitor is to be administered to the subject.
4. The use or method of any one of claims 1-3, wherein the PARP inhibitor is talazoparib, olaparib, rucaparib, veliparib, CEP9722, MK4827, BGB-290, or a pharmaceutically acceptable salt thereof.
5. The use or method of claim 4, wherein the PARP inhibitor is talazoparib or a pharmaceutically acceptable salt thereof.
6. The use or method of claim 5, wherein the PARP inhibitor is the tosylate salt of talazoparib.
7. Use of talazoparib or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating small cell lung cancer in a subject identified as expressing SLFN11.

8. The use or method of any one of claims 1-7, wherein talazoparib or a pharmaceutically acceptable salt thereof is to be administered orally, once daily, at a dose of 0.5 to 2 mg per day, or of 1 mg/day, or 0.10 to 0.75 mg/kg/day, or 0.25-0.30 mg/kg/day.
9. The use or method of any one of claims 1-8, wherein the subject expresses one or more of SIL1, SLC25A3, MAF, AP3B1, C1orf50, BCL2, DDX6, or GULP1.
10. The use or method of any one of claims 1-9, wherein the subject has an increased expression level of one or more of SLFN11, SIL1, SLC25A3, MAF, AP3B1, C1orf50, BCL2, DDX6, or GULP1.
11. The use or method of any one of claims 1-10, wherein the PARP inhibitor or talazoparib or a pharmaceutically acceptable salt thereof is to be administered in combination with one or more chemotherapeutic agents, surgery, and/or radiation.
12. The use or method of claim 11, wherein the one or more chemotherapeutic agents is a DNA damaging agent, temozolomide, a topoisomerase 1 inhibitor, irinotecan, topotecan, a topoisomerase 2 inhibitor, etoposide, enzalutamide, an ATR inhibitor, an EGFR inhibitor, a platinum drug, cisplatin, carboplatin, or etoposide.
13. The use or method of any one of claims 1-12, wherein the subject has previously been treated with a platinum drug, or with cisplatin, or with carboplatin, optionally in combination with etoposide.
14. The use or method of any one of claims 1-13, wherein the subject expresses a reduced level of ATM.

15. The use or method of any one of claims 2-6 or 8-14, wherein the detecting step comprises detection by an immunohistological assay, an immunohistochemistry staining (IHC) assay, an in-situ LC/MS assay, a promoter methylation assay, a cytological assay, an mRNA expression assay, an RT-PCR assay, a northern blot assay, a protein expression immunosorbent assay (ELISA), an enzyme-linked immunospot assay (ELISPOT), a lateral flow test assay, an enzyme immunoassay, a fluorescent polarization immunoassay, a chemiluminescent immunoassay (CLIA), or a fluorescence activated sorting assay (FACS).
16. The use or method of any one of claims 1 or 4-15, wherein the subject expresses an increased level of one or more of SLFN11, SIL1, SLC25A3, MAF, AP3B1, C1orf50, BCL2, DDX6, or GULP1.
17. The use or method of any one of claims 2-6 or 8-15, wherein the detecting step comprises detecting an increased level of SLFN11 and of one or more of SIL1, SLC25A3, MAF, AP3B1, C1orf50, BCL2, DDX6, or GULP1.
18. The use or method of claim 16, wherein the subject expresses a reduced level of ATM.
19. The use or method of claim 17, wherein the detecting step further comprises detecting ATM, or detecting a reduced level of expression of ATM.
20. The use or method of any one of the preceding claims, wherein the subject expresses a TP53 and/or a RB1 mutation.