CLAIMS

1. A method of determining whether a cancer cell is likely to be resistant to treatment by an mTOR inhibitor, the method comprising detecting: (i) PPP2R2B (GenBank Accession Number: NM_181678) or (ii) PDK1 (GenBank Accession Number: NM_002613), or both, in or of the cell.

2. A method according to Claim 1, which comprises detecting methylation of the PPP2R2B promoter in or of the cell, preferably in which hypermethylation of the PPP2R2B promoter, compared to a cancer cell that is not mTOR inhibitor resistant, indicates that the cancer cell is likely to be resistant to treatment by an mTOR inhibitor.

3. A method according to Claim 1 or 2, which comprises detecting expression and/or activity of PPP2R2B or PDK1 (such as PDK1 mediated Myc phosphorylation activity), or both, in or of the cell.

4. A method according to any preceding claim, in which a decreased expression and/or activity of PPP2R2B, or an increased expression and/or activity of PDK1, or both, compared to a cancer cell that is not mTOR inhibitor resistant, indicates that the cancer cell is likely to be resistant to treatment by an mTOR inhibitor.

5. A method of choosing a treatment for an individual suffering from or suspected to be suffering from a cancer, the method comprising: (a) providing a cell of the patient; (b) detecting mTOR inhibitor resistance of the cell by method according to any preceding claim; and (c) where the cell is determined not to be mTOR inhibitor resistant, choosing an mTOR inhibitor as a treatment for the individual, and where the cell is determined to be mTOR inhibitor resistant, choosing a different treatment for the individual.

6. A method of determining whether an individual suffering from or suspected to be suffering from a cancer will respond to treatment by an mTOR inhibitor, the method comprising performing a method according to any of Claims 1 to 4 on a cell of the individual, and, where the cell is determined not to be mTOR inhibitor resistant, determining that the individual is likely to respond to treatment by an mTOR inhibitor.

7. A method of increasing the sensitivity of a cancer cell to treatment by an mTOR inhibitor, the method comprising increasing expression and/or activity of PPP2R2B, or decreasing expression and/or activity of PDK1, or both, in or of the cell.

8. A method of treating or preventing cancer in an individual suffering or suspected to be suffering from cancer, the method comprising increasing expression and/or activity of PPP2R2B, or decreasing expression and/or activity of PDK1, or both, in or of the individual.

9. A method according to Claim 7 or 8, in which expression of PPP2R2B is increased by decreasing methylation of the PPP2R2B promoter, such as by exposing the cell to, or administering to a patient, a demethylating agent such as 5-aza-dC or Azacitidine.

10. A method according to any of Claims 7 to 9, which comprises exposing the cell to, or administering to a patient, a PDK1 inhibitor such as BX912 (CAS Accession Number: 702674-56-4) or BX795 (CAS Accession Number: 702675-74-9).

11. A method of treating or preventing cancer in an individual suffering or suspected to be suffering from cancer, the method comprising administering an inhibitor of PDK1 expression and/or activity together with an mTOR inhibitor.

12. A combination of an inhibitor of PDK1 expression and/or activity and an mTOR inhibitor for use in a method of treatment or prevention of cancer.

13. Use of a combination of an inhibitor of PDK1 expression and/or activity and an mTOR inhibitor in the manufacture of a medicament for the treatment or prevention of cancer.

14. Use of PPP2R2B or PDK1, or both, as a biomarker for sensitivity of a cancer cell to an mTOR inhibitor or for colorectal cancer (CRC), such as rapamycin resistance colorectal cancer.

15. A method or composition according to any preceding claim, in which the mTOR inhibitor comprises rapamycin or a derivative thereof, or in which the PDK1 inhibitor comprises a shRNA, BX912 (CAS Accession Number: 702674-56-4) or BX795 (CAS Accession Number: 702675-74-9), or any combination thereof.

16. PDK1 or an antagonist thereof for use in a method of treating colorectal cancer (CRC).

17. A method or composition according to any preceding claim, in which the cancer is selected from the group consisting of: colorectal cancer (CRC), bladder cancer, brain cancer and oesophageal cancer, preferably colorectal cancer (CRC).

18. A method, combination, or use substantially as hereinbefore described with reference to and as shown in Figures 1 to 31 of the accompanying drawings.

CLAIMS

1. A thing.