CLAIMS

1. VHZ for use in a method of treatment, prophylaxis or alleviation of a cancer, such as breast cancer, in an individual.

2. An anti-VHZ agent for the treatment, prophylaxis or alleviation of cancer such as breast cancer, for example an invasive or metastatic cancer such as Invasive Ductal Carcinoma (IDC), preferably in which the anti-VHZ agent is capable of down-regulating any combination of the expression, amount or activity of a VHZ sequence shown as GenBank accession number NM_017823 or NP_060293, or a sequence which has at least 90% sequence identity to that sequence, the anti-VHZ agent preferably comprising an anti-VHZ antibody such as an anti-peptide antibody generated against RRLRPGSIEYEQEK corresponding to amino acid residues (126-140) of human VHZ, such as chicken anti-human VHZ antibody (catalogue numbers LS-C32281, amino acids 35 to 90, LS-C42458, LS-A6806 and LS-A6803, LS-C32281, LifeSpan Inc, Seattle, Washington, USA), rabbit anti-human VHZ antibody (catalogue number DS-PB-00676, RayBiotech Inc, Norcross, Georgia, USA), chicken anti-human VHZ antibody (catalogue number XW-7857, ProSci Incorporated, Poway, California, USA), rabbit anti-human VHZ antibody (catalogue number F4560 and D9840-66A, United States Biological, Swampscott, Massachusetts, USA), chicken anti-human VHZ antibody (catalogue number D9840-66, United States Biological, Swampscott, Massachusetts, USA), rabbit anti-human VHZ antibody (catalogue number AHP1142, AdB Serotec, Oxford, United Kingdom), rabbit anti-human VHZ antibody (catalogue number NB110-40452, Novus Biologicals, Littleton, Colorado, USA), chicken anti-human VHZ antibody (catalogue number NB100-75328, Novus Biologicals, Littleton, Colorado, USA), or is capable of downregulating VHZ by RNA interference, such as comprising a Small Interfering RNA (siRNA), Short Hairpin RNA (shRNA), or Chimera RNAi such as a DUSP23 Pre-design Chimera RNAi (catalogue number H00054935-R01, Novus Biologicals, Littleton, Colorado, USA).

3. A kit for detecting breast cancer in an individual or susceptibility of the individual to breast cancer comprising means for detection of VHZ expression in the individual or a sample taken from him or her, preferably in which the means for detection is selected from the group consisting of: a VHZ polynucleotide or a fragment thereof; a complementary nucleotide sequence to VHZ nucleic acid or a fragment thereof; a VHZ polypeptide or a fragment thereof, or an anti-VHZ antibody or an anti-VHZ agent according to Claim 2, and optionally

instructions for use, preferably further comprising a therapeutic drug for treatment, prophylaxis or alleviation of breast cancer, such as comprising Tamoxifen or Herceptin.

4. A method of detecting a cancer cell such as a breast cancer cell, such as invasive or metastatic cancer cell such as Invasive Ductal Carcinoma (IDC), the method comprising detecting modulation (preferably up-regulation) of expression, amount or activity of VHZ in the cell, preferably in which the expression of VHZ is compared to the expression, amount or activity of VHZ in a control cell known to be non-cancerous.

5. A method according to Claim 4, in which the method comprises detecting a VHZ nucleic acid, such as by means of a probe comprising at least a portion of a nucleic acid having a sequence shown as GenBank accession number NM_017823 or NP_060293 or a sequence having at least 90% sequence identity to such a sequence, or in which the method comprises detecting a VHZ polypeptide, such as by means of an anti-VHZ antibody set out in Claim 2.

6. A method according to Claim 4 or 5, which further comprises histological grading, such as by using the Elston-Ellis modified Scarff, Bloom, Richardson grading system (Nottingham Grading System (NGS)).

7. A method of determining the proliferative state of a cell, or determining the likelihood that a cell will become invasive or aggressive, the method comprising detecting modulation of expression, amount or activity of VHZ in the cell.

8. A method of predicting a survival rate of an individual with cancer, the method comprising detecting modulation of expression of VHZ in a cell of the individual

9. A method of choosing a therapy for an individual with cancer, the method comprising detecting modulation of expression of VHZ in a cell of the individual choosing an appropriate therapy, such as an anti-VHZ agent, based on the aggressiveness of the cancer.

10. A method of determining the likelihood of success of a particular therapy in an individual with a cancer, the method comprising comparing the therapy with a therapy determined by a method according to Claim 9.

11. A method according to any of Claims 4 to 10, further comprising a feature set out in any of Claims 1 to 3.

12. A method of manipulating a cancer cell, such as a breast cancer cell, such as an invasive or metastatic cancer cell such as Invasive Ductal Carcinoma (IDC), the method comprising modulating (preferably down-regulating) the expression, amount or activity of VHZ in the cell, for example by exposing the cell to an siRNA, shRNA or Chimera RNAi capable of specifically binding to VHZ, or by exposing the cell to an anti-VHZ antibody set out in Claim 2, preferably such that the cancer cell becomes non-cancerous or the invasive or metastatic cancer cell becomes non-invasive or non-metastatic as a result of the manipulation.

13. A method of manipulating a cell, the method comprising the steps of: (a) detecting increased VHZ expression, amount or activity in a cell; and (b) reducing the level of VHZ in the cell.

14. A method of identifying a molecule capable of binding to a VHZ polypeptide, the method comprising contacting a VHZ polypeptide or a sequence having at least 90% sequence identity thereto with a candidate molecule and determining whether the candidate molecule binds to the VHZ polypeptide or sequence having at least 90% sequence identity thereto.

15. A method of identifying a modulator of VHZ, the method comprising contacting a cell with a candidate molecule and detecting elevated or reduced expression, amount or activity of VHZ in or of the cell.

16. A method of identifying a molecule suitable for the treatment, prophylaxis or alleviation of cancer, the method comprising determining if a candidate molecule is an agonist or antagonist of VHZ or a sequence having at least 90% sequence identity thereto, preferably by exposing a candidate molecule to a VHZ polypeptide or a cell expressing a VHZ polypeptide in order to determine if the candidate molecule is an agonist or antagonist thereof.

17. A method of identifying an agonist or antagonist of a VHZ or a sequence having at least 90% sequence identity thereto, the method comprising administering a candidate molecule to an animal and determining whether the animal exhibits increased or decreased expression, amount or activity of VHZ.

18. A method of treatment, prophylaxis or alleviation of a cancer (for example, breast cancer, such as invasive or metastatic cancer such as Invasive Ductal Carcinoma (IDC)) in an individual, the method comprising modulating the expression, amount or activity of a VHZ in

a cell of an individual, preferably in which the expression, amount or activity of VHZ is decreased in a breast cell of the individual.

19. A method of diagnosis of a cancer or susceptibility to cancer (for example, breast cancer, such as invasive or metastatic cancer such as Invasive Ductal Carcinoma (IDC)) in an individual or prognosis of an individual with cancer, the method comprising detecting modulation of expression, amount or activity of VHZ in a cell of the individual.

20. A method of determining whether a tumour in an individual is, or is likely to be, an invasive or metastatic tumour, the method comprising detecting modulation of expression, amount or activity of VHZ in a tumour cell of the individual.

21. A method of treatment, prophylaxis or alleviation of cancer (for example, breast cancer, such as invasive or metastatic cancer such as Invasive Ductal Carcinoma (IDC)) in an individual, the method comprising detecting modulation of expression, amount or activity of VHZ in a cell of the individual and administering an appropriate therapy, such as an anti-VHZ agent, to the individual based on the aggressiveness of the tumour.

22. A method according to any of Claims 18 to 22, in which the diagnosis, prognosis or choice of therapy is further determined by assessing the size of the tumour, or the lymph node stage, or both, optionally together or in combination with other risk factors, preferably in which the diagnosis, prognosis or choice of therapy is further determined by assessing the oestrogen receptor (ER) status of the tumour.

23. A molecule, agonist or antagonist of a VHZ polypeptide identified by a method or use according to any of Claims 14 to 17.

24. A molecule capable of modulating, such as down-regulating, the expression of a VHZ for use in the treatment, prophylaxis or alleviation of cancer, such as an anti-peptide antibody generated against RRLRPGSIETYEQEK corresponding to amino acid residues (126-140) of human VHZ.

25. A method or thing as hereinbefore described with reference to and as shown in Figures 1 to 14 of the accompanying drawings.

CLAIMS:

1. Use of an anti-VHZ agent in the manufacture of a medicament for the treatment, prophylaxis or alleviation of cancer.

2. The use according to claim 1 wherein the cancer is breast cancer.

3. The use according to claim 1 or claim 2 wherein the anti-VHZ agent is capable of down-regulating any combination of the expression, amount or activity of a VHZ sequence shown as GenBank accession number NM_017823 or NP_060293, or a sequence which has at least 90% sequence identity to that sequence,

4. The use according to claim 1 or claim 2 wherein the anti-VHZ agent is an anti-VHZ antibody.

5. The use according to claim 4 wherein the anti-VHZ antibody is a humanised antibody.

6. The use according to claim 4 wherein the anti-VHZ antibody is an anti-peptide antibody generated against RRLRPGSIETYEQEK corresponding to amino acid residues (126-140) of human VHZ.

7. The use according to claim 4 wherein the antibody is selected from the group consisting of:

chicken anti-human VHZ antibody (catalogue numbers LS-C32281, amino acids 35 to 90, LS-C42458, LS-A6806 and LS-A6803, LS-C32281, LifeSpan Inc, Seattle, Washington, USA);

rabbit anti-human VHZ antibody (catalogue number DS-PB-00676, RayBiotech Inc, Norcross, Georgia, USA);

chicken anti- human VHZ antibody (catalogue number XW-7857, ProSci Incorporated, Poway, California, USA);

rabbit anti-human VHZ antibody (catalogue number F4560 and D9840-66A, United States Biological, Swampscott, Massachusetts, USA);

chicken anti-human VHZ antibody (catalogue number D9840-66, United States Biological, Swampscott, Massachusetts, USA);

rabbit anti-human VHZ antibody (catalogue number AHP1142, AdB Serotec, Oxford, United Kingdom);

rabbit anti-human VHZ antibody (catalogue number NBII0-40452, Novus Biologicals, Littleton, Colorado, USA); and

chicken anti-human VHZ antibody (catalogue number NB100-75328, Novus Biologicals, Littleton, Colorado, USA).

8. The use according to claim 1 or claim 2 wherein the anti-VHZ agent is capable of downregulating VHZ by RNA interference

9. The use according to claim 8 wherein the anti-VHZ agent is a Small Interfering RNA (siRNA), Short Hairpin RNA (shRNA), or Chimera RNAi, or a DUSP23 Pre-design Chimera RNAi (catalogue number H00054935-ROI, Novus Biologicals, Littleton, Colorado, USA).

10. A method of detecting a cancer cell, the method comprising detecting modulation (preferably up-regulation) of expression, amount or activity of VHZ in a cell in a sample obtained from an individual.

11. The method of claim 10 in which the expression of VHZ is compared to the expression, amount or activity of VHZ in a control cell known to be non-cancerous.

12. The method according to Claim 10, in which the method comprises detecting a VHZ nucleic acid or a VHZ polypeptide.

13. The method according to claim 10 wherein the VHZ nucleic acid is detected by means of a probe comprising at least a portion of a nucleic acid having a sequence shown as GenBank accession number NM_017823 or

NP_060293 or a sequence having at least 90% sequence identity to such a sequence, or in which the method comprises detecting a VHZ polypeptide by means of an anti-VHZ antibody.