CLAIMS

1. An isolated mitochondrial fusion protein, the fusion protein having an amino acid sequence resulting from the translation of a mitochondrial fusion transcript corresponding to a mutation in mitochondrial DNA, wherein the fusion protein has an amino acid sequence as set forth in SEQ ID NO: 58.

2. A method of detecting the presence of a cancer in a mammal, the method comprising assaying a tissue sample from the mammal for the presence of at least one mitochondrial fusion protein, the fusion protein having an amino acid sequence resulting from the translation of a mitochondrial fusion transcript corresponding to a mutation in mitochondrial DNA, wherein the fusion protein has an amino acid sequence as set forth in SEQ ID NO: 58.

3. The method of claim 2, wherein the cancer is selected from the group consisting of prostate cancer, testicular cancer, ovarian cancer, breast cancer, colorectal cancer, lung cancer and melanoma skin cancer.

4. The method of claim 2 or 3, wherein said assaying comprises an immunological assay, and wherein said assaying is conducted with an antibody, or an antigen-binding fragment thereof, having a specificity to the fusion protein of claim 1.

5. A kit for conducting an assay for detecting the presence of a cancer in a mammal, said kit comprising an antibody, or an antigen-binding fragment thereof, having specificity to a binding site of the fusion protein of claim 1 and instructions for using the kit, wherein the binding site is an amino acid sequence resulting from translation of the fusion transcript corresponding to the mutation in mitochondrial DNA.

6. A kit according to claim 5, wherein the cancer is selected from the group consisting of prostate cancer, testicular cancer, ovarian cancer, breast cancer, colorectal cancer, lung cancer and melanoma skin cancer.

7. An isolated mitochondrial fusion transcript having a nucleic acid sequence as set forth in SEQ ID NO: 56.

8. An isolated mtDNA encoding the fusion transcript of claim 7.

9. The isolated mtDNA of claim 8 having a sequence as set forth in SEQ ID NO: 57.

10. A method of detecting the presence of a cancer in a mammal, the method comprising assaying a tissue sample from the mammal for the presence of the mitochondrial fusion transcript according to claim 7, by quantifying the amount of the fusion transcript in the sample and comparing the quantity detected with a reference value.

11. The method of claim 10, wherein the cancer is selected from the group consisting of prostate cancer, testicular cancer, ovarian cancer, breast cancer, colorectal cancer, lung cancer and melanoma skin cancer.

12. The method of claim 4, wherein the antibody is a polyclonal or monoclonal antibody.

13. The kit of claim 5, wherein the antibody is a polyclonal or monoclonal antibody.

14. The method of claim 4 or 12, wherein the method is conducted with a kit comprising the antibody or antigen-binding fragment thereof and instructions for using the kit.