

WHAT IS CLAIMED IS:

1. An ErbB3 gastrointestinal cancer detecting agent comprising a polynucleotide reagent capable of specifically binding to an ErbB3 mutation codon in an ErbB3 nucleic acid sequence, wherein the mutation codon encodes an amino acid substitution mutation in SEQ ID NO:2 at a position selected from the group 104, 809, 232, 262, 284, 325, 846, 928, 60, 111, 135, 295, 406, 453, 498, 1164, and 193.

2. The cancer detecting agent of claim 1, wherein the ErbB3 nucleic acid sequence comprises SEQ ID NO:230 or 1.

3. The cancer detecting agent of claim 1, wherein the polynucleotide reagent is complementary to a polynucleotide of formula

5' Xa-Y-Zb 3' Formula I,

wherein

X is not present when a is 0, or X is a nucleic acid sequence comprising 1 to 250 nucleotides of the ErbB3 nucleic acid sequence when a is between 1 and 250;

Y is the ErbB3 mutation codon; and

Z is not present when b is 0, or Z is a nucleic acid sequence comprising 1 to 250 nucleotides of the ErbB3 nucleic acid sequence when b is between 1 and 250.

4. The cancer detecting agent of any one of claims 1-3, wherein the detecting agent is conjugated with a detectable label.

5. The cancer detecting agent of claim 4, wherein the detectable label is selected from the group radioisotope label, fluorescent label, bioluminescent label, and enzymatic label.

6. The cancer detecting agent of any one of claims 1-5, wherein the amino acid substitution mutation is selected from V104M, V104L, Q809R, A232V, P262H, P262S, G284R,

G325R, S846I, E928G, M60K, Y111C, R135L, V295A, M406K, M406T, R453H, T1164A, and a stop codon at position 193.

7. A method of determining the presence of ErbB3 gastrointestinal cancer in a subject comprising detecting in a biological sample, which is a gastrointestinal tissue sample obtained from the subject, a substitution mutation in a nucleic acid sequence encoding ErbB3, wherein the substitution mutation results in an amino acid change at a position of SEQ ID NO:2 selected from the group V104M, V104L, Q809R, A232V, P262H, P262S, G284R, G325R, S846I, E928G, M60K, Y111C, R135L, V295A, M406K, M406T, R453H, K498I, T1164A, and a stop codon at position 193 and wherein the mutation is indicative of an ErbB3 gastrointestinal cancer in the subject.

8. The detecting agent of claim 1, wherein the gastrointestinal cancer is gastric cancer or colon cancer.

9. The method of claim 7, wherein the gastrointestinal cancer is gastric cancer or colon cancer.

10. The method of claim 7, wherein the detecting comprises amplifying or sequencing the mutation and detecting the mutation or sequence thereof.

11. The method of claim 10, wherein the amplifying comprises admixing an amplification primer or amplification primer pair with a nucleic acid template isolated from the sample.

12. The method of claim 11, wherein the primer or primer pair is complementary or partially complementary to a region proximal to or including said mutation, and is capable of initiating nucleic acid polymerization by a polymerase on the nucleic acid template.

13. The method of claim 11, further comprising extending the primer or primer pair in a DNA polymerization reaction comprising a polymerase and the template nucleic acid to generate an amplicon.

14. The method of claim 10, wherein the mutation is detected by a process that includes one or more of: sequencing the mutation in a genomic DNA isolated from the biological sample, hybridizing the mutation or an amplicon thereof to an array, digesting the mutation or an amplicon thereof with a restriction enzyme, or real-time PCR amplification of the mutation.

15. The method of claim 10, comprising partially or fully sequencing the mutation in a nucleic acid isolated from the biological sample.

16. The method of claim 10, wherein the amplifying comprises performing a polymerase chain reaction (PCR), reverse transcriptase PCR (RT-PCR), or ligase chain reaction (LCR) using a nucleic acid isolated from the biological sample as a template in the PCR, RT-PCR, or LCR.

17. Use of an ErbB inhibitor for the manufacture of a medicament for treating gastrointestinal cancer in a subject in need comprising

a) detecting in a biological sample obtained from the subject a mutation in a nucleic acid sequence encoding ErbB3, wherein the mutation results in an amino acid change at a position of SEQ ID NO:2 selected from the group consisting of V104M, V104L, Q809R, A232V, P262H, P262S, G284R, G325R, S846I, E928G, M60K, Y111C, R135L, V295A, M406K, M406T, R453H, K498I, T1164A, and a stop codon at position 193 and wherein the mutation is indicative of an ErbB3 gastrointestinal cancer in the subject; and

b) wherein the ErbB inhibitor is to be administered to the subject identified as having Erb3 gastrointestinal cancer.

18. The use of claim 17, wherein the ErbB inhibitor is selected from the group consisting of an EGFR antagonist, an ErbB2 antagonist, an ErbB3 antagonist, an ErbB4 antagonist, and an EGFR/ErbB3 antagonist.

19. The use of claim 18, wherein the antagonist is a small molecule inhibitor.
20. The use of claim 18, wherein the antagonist is an antagonist antibody.
21. The use of claim 20, wherein the antibody is selected from the group consisting of a monoclonal antibody, a bispecific antibody, a chimeric antibody, a human antibody, a humanized antibody and an antibody fragment.
22. The use of claim 17, wherein the gastrointestinal cancer is gastric cancer or colon cancer.