CLAIMS

1. A process for detecting breast cancer in a human individual comprising determining in vitro the presence or absence of chromosome interactions in a sample from the individual, wherein the presence or absence of:

(i) all of the chromosome interactions represented by the following probes (Marker Set 1) is determined;

- ATTTCTTTCTTCTTCCCATTTTCTAAAATCGATTTTTAAATTAAAGGTACAAGTTAAGGC,
- GGATGGAGGAAGAGGAGGAATTCAAGACTCGAACTAAACAAAAAGGAGATGATCCTGGGT,
- AGCTCAAATTCTTTTACTAATTGTTACATCGAAAGTTCAAAATTAAATTTTAAACGTTTT,
- CCAAAGACAGCCAAGGAAAAACTAAAGATCGAAAGTTTTTATTACTTCCAAATTAGTAAA,
- AATTTAGAGGAACTCTATATAAACAACATCGAAACTTTGCTTCATGCACAAAATTTAAAA,
- TTGGAGGGAAAAGTAATTACGTTCAACTTCGACTGTATTCTACAAAGTGCTGGGATTACA,
- ATACTCATCATAAATGTCAGATTTATAATCGAGATCACAGTGAGCTGAGATTGCACCACT,
- AGGATCTCATGATGCTTTGAATACTTTCTCGATACCTTATTATAAAATCAGCTTTGTGTT;

or

(iii) all of the chromosome interactions represented by the following probes (Marker Set 2) is determined;

- TTGGAGGGAAAAGTAATTACGTTCAACTTCGACTGTATTCTACAAAGTGCTGGGATTACA,
- GGAGGAGGCCAGAGAAAAGAGAATGTGATCGATTTCTAAAATACTGTGTGTGTGTATGTA,
- GGATGGAGGAAGAGGAGGAATTCAAGACTCGAACTAAACAAAAAGGAGATGATCCTGGGT,
- AGGATCTCATGATGCTTTGAATACTTTCTCGATACCTTATTATAAAATCAGCTTTGTGTT,
- AGCTCAAATTCTTTTACTAATTGTTACATCGAAAGTTCAAAATTAAATTTTAAACGTTTT,
- AATTTAGAGGAACTCTATATAAACAACATCGAAACTTTGCTTCATGCACAAAATTTAAAA,
- CAGAAATGCACGCACAGGCACAACAGCATCGAAACCGGTTCTTTGGAGGCTCAGTTTTTG,
- CCTACATATACATGGAATATTCCTGGTATCGAAATATTTTAGGTAATCATTATTTGTCTA;

wherein the determining of the presence or absence of each chromosome interaction comprises:

(i) cross-linking in the sample of chromosome interactions of the individual,

(ii) subjecting the cross-linked DNA to cutting,

(iii) ligating the cross-linked cleaved DNA ends to form ligated nucleic acid, and

(iv) detecting the presence or absence of ligated nucleic corresponding to each chromosome interaction using the said probe that represents that chromosome interaction.

2. A process according to claim 1 wherein detecting the presence or absence of the ligated nucleic acid is by quantitative PCR (qPCR) which uses primers capable of amplifying the ligated nucleic acid and the probe binds the ligation site during the PCR reaction.

3. A process according to claim 2 wherein said probe comprises a quencher covalently attached to the 3’ end of the probe.

4. A process according to claim 2 or 3 wherein said probe comprises a fluorophore covalently attached to the 5’ end of the probe.

5. A process according to claim 4 wherein said fluorophore is selected from HEX, Texas Red and FAM.