-continued

<400> SEQUENCE: 6

cgcctcaaag tgctgggatt acaggcg 27

What is claimed is:

1. A method for quantifying a human genomic double stranded DNA target in a sample fluid containing or suspected of containing said target, comprising:

combining in a microfluidic channel (i) the sample fluid and (ii) at least one molecular beacon probe capable of binding to at least one repetitive human Alu sequence said probe further comprising a signaling moiety; to form a test fluid, wherein said target in the sample fluid has not been amplified;

heating said test fluid to denature the double stranded DNA and cooling said test fluid to facilitate binding of the molecular beacon probe to said target so that the molecular beacon probe becomes bound to said target;

locating the test fluid in a detector region in the microfluidic channel;

detecting the signaling moiety; and

quantifying said target in the sample fluid within 1 minute of combining the sample fluid and the molecular beacon probe.

2. The method of claim 1, wherein the quantifying step comprises determining the concentration of said target in the test fluid.

3. The method of claim 1, wherein the molecular beacon probe has a unique specificity for said at least one repetitive human Alu sequence.

4. The method of claim 1, wherein the locating step comprises flowing the test fluid to the detector region in the microfluidic channel.

5. The method of claim 4, wherein the locating step comprises flowing the test fluid through the detector region of the microfluidic channel during detection.

6. The method of claim 1, wherein the locating step comprises maintaining the test fluid stationary at a region in the microfluidic channel and moving a detector into alignment with the region to transform the region into the detector region.

7. The method of claim 1, wherein the microfluidic channel is located in a biochip comprising a plurality of microfluidic channels and areas for sample manipulation; and wherein the method further comprises after the quantifying step, a step comprising directing a selected quantity of the sample fluid to an area of the biochip, wherein said selected quantity is determined, at least in part, based on the results of the quantifying step.

8. The method of claim 1, wherein detecting the signaling moiety comprises irradiating the signaling moiety with a laser.

9. The method of claim 8, wherein the microfluidic channel is contained in a biochip and wherein the laser is a component of a system coupled to the biochip comprising the microfluidic channel.

10. The method of claim 1, wherein detecting the signaling moiety comprises detecting fluorescence.

11. The method of claim 1, wherein said target, if present, has a concentration less than 1 nanogram per microliter or is present in a total amount in the sample fluid of less than 1 nanogram.

12. The method of claim 1, wherein the sample fluid comprises a forensic sample.

13. The method of claim 1, wherein the sample fluid further comprises non-human, non-target nucleic acid.

14. The method of claim 1 wherein the quantifying step comprises determining the total amount of the target in the test fluid.

15. The method of claim 1 wherein the molecular beacon probe comprises SEQ ID NO: 5 or SEQ ID NO: 6.

16. A method for quantifying a human genomic double stranded DNA target in a sample fluid containing or suspected of containing said target, comprising:

combining in a microfluidic channel (i) the sample fluid and (ii) at least one molecular beacon probe capable of binding to at least one repetitive human Alu sequence, said probe further comprising a signaling moiety to form a test fluid, wherein said target in the sample fluid has not been amplified;

heating said test fluid to denature the double stranded DNA and cooling said test fluid to facilitate binding of the molecular beacon probe to said target so that the molecular beacon probe becomes bound to said target;

locating the test fluid in a detector region in the microfluidic channel;

detecting the signaling moiety; and

quantifying said target in the sample fluid within 1 minute of combining the sample fluid and the molecular beacon probe;

wherein said target has a concentration less than 1 nanograms per microliter or is present in a total amount in the sample fluid of less than 1 nanogram.

17. The method of claim 16, wherein the quantifying step comprises determining the concentration of said target in the test fluid.

18. The method of claim 16, wherein the quantifying step comprises determining the total amount of said target in the test fluid.

19. The method of claim 16, wherein the molecular beacon probe has a unique specificity for said at least one repetitive human Alu sequence.

20. The method of claim 16, wherein the locating step comprises flowing the test fluid to the detector region in the micro fluidic channel.

21. The method of claim 20, wherein the locating step comprises flowing the test fluid through the detector region of the micro fluidic channel during detection.

22. The method of claim 16, wherein the locating step comprises maintaining the test fluid stationary at a region in the microfluidic channel and moving a detector into alignment with the region to transform the region into the detector region.

23. The method of claim 16, wherein the microfluidic channel is located in a biochip comprising a plurality of microfluidic channels and areas for sample manipulation; and wherein the method further comprises after the quantifying step, a step comprising directing a selected quantity of the sample fluid to an area of the biochip, wherein said selected quantity is determined, at least in part, based on the results of the quantifying step.

24. The method of claim 16, wherein detecting the signaling moiety comprises irradiating the signaling moiety with a laser.