CLAIMS

1. A composition comprising a set of polynucleotides selected from the group consisting of Set 29, and Set-1 through Set-28.

2. The composition of claim 1, further comprising a probe, wherein preferably the probe comprises a label, more preferably the probe is a labeled polynucleotide, and even more preferably said labeled polynucleotide comprises:

(a) a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 6-33 of SEQ ID NO: 135, nucleotides 6-30 of SEQ ID NO: 136, nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 143, nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, nucleotides 8-30 of SEQ ID NO: 146, 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-32 of SEQ ID NO: 151, nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 7-25 of SEQ ID NO: 159, nucleotides 8-22 of SEQ ID NO: 160, nucleotides 6-22 of SEQ ID NO: 161, nucleotides 3-22 of SEQ ID NO: 162, nucleotides 8-28 of SEQ ID NO: 163, nucleotides 3-28 of SEQ ID NO: 164, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 3-22 of SEQ ID NO: 170, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 4-23 of SEQ ID NO: 177, nucleotides 4-34 of SEQ ID NO: 178, nucleotides 3-27 of SEQ ID NO: 179, nucleotides 2-27 of SEQ ID NO: 180, nucleotides 5-33 of SEQ ID NO: 181, nucleotides 3-30 of SEQ ID NO: 182, nucleotides 9-34 of SEQ ID NO: 183;

(b) a sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183.

3. The composition of claim 1 or 2, wherein the label is a fluorophore, wherein optionally the fluorophore is covalently attached to a terminus of the polynucleotide.

4. The composition of any one of clams 1-3, further comprising a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 9-34 of SEQ ID NO: 183, and nucleotides 8-28 of SEQ ID NO: 184, and wherein the set of polynucleotides is selected from the group consisting of Set 29, Sets 22-28, Sets 9-12, and Set-17, wherein optionally:

(a) the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 184, SEQ ID NO: 147, SEQ ID NO: 148, SEQ ID NO: 149, SEQ ID NO: 150, SEQ ID NO: 155, SEQ ID NO: 156, SEQ ID NO: 165, SEQ ID NO: 166, SEQ ID NO: 167, SEQ ID NO: 168, SEQ ID NO: 169, SEQ ID NO: 171, SEQ ID NO: 172, SEQ ID NO: 173, SEQ ID NO: 174, SEQ ID NO: 175, SEQ ID NO: 176, and SEQ ID NO: 183; and/or

(b) the sequence of the labeled polynucleotides is SEQ ID NO: 184, and the set of polynucleotides is Set-29.

5. The composition of any one of claims 1-4, further comprising:

(a) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, and nucleotides 1-23 of SEQ ID NO: 154, and wherein the set of polynucleotides is selected from the group consisting of Sets 9-11, Set-17, and Sets 23-29, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 152, SEQ ID NO: 153, and SEQ ID NO:154;

(b) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, and nucleotides 8-30 of SEQ ID NO: 146, and wherein the set of polynucleotides is selected from the group consisting of Set-4, Sets 9-12, Set-17, and Sets 22-26, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 144, SEQ ID NO: 145, and SEQ ID NO: 146;

(c) a labeled polynucleotide comprising nucleotides 3-22 of SEQ ID NO: 170, and wherein the set of polynucleotides is selected from the group consisting of Set-5, Set-12, Set-17, and Sets 22-25, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 170.

(d) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 2-27 of SEQ ID NO: 180 and nucleotides 3-30 of SEQ ID NO: 182, and wherein the set of polynucleotides is selected from the group consisting of Sets 6-8, Set-15, and Set-16, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 180 and SEQ ID NO: 182;

(e) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 4-34 of SEQ ID NO: 178 and nucleotides 5-33 of SEQ ID NO: 181, and wherein the set of polynucleotides is selected from the group consisting of Sets 6-11 and Sets 28-29, wherein optionaly the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 178 and SEQ ID NO: 181;

(f) a labeled polynucleotide comprising nucleotides 3-27 of SEQ ID NO: 179, and wherein the set of polynucleotides is selected from the group consisting of Sets 6-9 and Set-11, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 179;

(g) a labeled polynucleotide comprising nucleotides 4-23 of SEQ ID NO: 177, and wherein the set of polynucleotides is selected from the group consisting of Sets 6-9, Set-11, and Set-28, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 177;

(h) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 7-25 of SEQ ID NO: 159 and nucleotides 8-22 of SEQ ID NO: 160, and wherein the set of polynucleotides is selected from the group consisting of Sets 13-15, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 159 and SEQ ID NO: 160;

(i) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 6-22 of SEQ ID NO: 161, and nucleotides 3-22 of SEQ ID NO: 162, and wherein the set of polynucleotides is selected from the group consisting of Sets 13-16, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 157, SEQ ID NO: 158, SEQ ID NO: 161, and SEQ ID NO: 162;

(j) a labeled polynucleotide comprising a sequence selected from the group of nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 151, and nucleotides 4-24 of SEQ ID NO: 153, and wherein the set of polynucleotides is Set-3, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 137, SEQ ID NO: 138, SEQ ID NO: 139, SEQ ID NO: 140, SEQ ID NO: 141, SEQ ID NO: 142, SEQ ID NO: 151, and SEQ ID NO: 153;

(k) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 163 and nucleotides 3-28 of SEQ ID NO: 164, and wherein the set of polynucleotides is selected from the group consisting of Set-1, Set-2, and Sets 18-20, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 163 and SEQ ID NO: 164; and/or

(l) a labeled polynucleotide comprising a sequence selected from the group consisting of nucleotides 6-33 of SEQ ID NO: 135 and nucleotides 6-30 of SEQ ID NO: 136, and wherein the set of polynucleotides is selected from the group consisting of Set-1, Set-2 and Sets 18-21, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 135 and SEQ ID NO: 136.

6. The composition of any one of the preceding claims, which comprises a probe that is a molecular beacon comprising a fluorophore, a quencher, and a polynucleotide, wherein preferably the molecular beacon comprises a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 6-33 of SEQ ID NO: 135, nucleotides 6-30 of SEQ ID NO: 136, nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 143, nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, nucleotides 8-30 of SEQ ID NO: 146, 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-32 of SEQ ID NO: 151, nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 7-25 of SEQ ID NO: 159, nucleotides 8-22 of SEQ ID NO: 160, nucleotides 6-22 of SEQ ID NO:

161, nucleotides 3-22 of SEQ ID NO: 162, nucleotides 8-28 of SEQ ID NO: 163, nucleotides 3-28 of SEQ ID NO: 164, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 3-22 of SEQ ID NO: 170, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 4-23 of SEQ ID NO: 177, nucleotides 4-34 of SEQ ID NO: 178, nucleotides 3-27 of SEQ ID NO: 179, nucleotides 2-27 of SEQ ID NO: 180, nucleotides 5-33 of SEQ ID NO: 181, nucleotides 3-30 of SEQ ID NO: 182, and nucleotides 9-34 of SEQ ID NO: 183; more preferably the molecular beacon comprises a sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183, and even more preferably, said polynucleotide sequence consists of SEQ ID NO: 184.

7. A molecular beacon comprising a fluorophore, a quencher, and a polynucleotide, wherein the polynucleotide comprises a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 6-33 of SEQ ID NO: 135, nucleotides 6-30 of SEQ ID NO: 136, nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 143, nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, nucleotides 8-30 of SEQ ID NO: 146, 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-32 of SEQ ID NO: 151, nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 7-25 of SEQ ID NO: 159, nucleotides 8-22 of SEQ ID NO: 160, nucleotides 6-22 of SEQ ID NO: 161, nucleotides 3-22 of SEQ ID NO: 162, nucleotides 8-28 of SEQ ID NO: 163, nucleotides 3-28 of SEQ ID NO: 164, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 3-22 of SEQ ID NO: 170, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 4-23 of SEQ ID NO: 177, nucleotides 4-34 of SEQ ID NO: 178, nucleotides 3-27 of SEQ ID NO:

179, nucleotides 2-27 of SEQ ID NO: 180, nucleotides 5-33 of SEQ ID NO: 181, nucleotides 3-30 of SEQ ID NO: 182, and nucleotides 9-34 of SEQ ID NO: 183.

8. The molecular beacon of claim 7, wherein:

(a) the polynucleotide comprises or consists of a sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183; and/or

(b) (i) the fluorophore is FAM and the quencher is BHQ1, or (ii) the fluorophore is ATTO 565 or Alexa 594 and the quencher is BHQ1 or BHQ2.

9. A method of detecting β-actin in a test sample, the method comprising:

(a) extracting nucleic acid from the test sample;

(b) amplifying a target sequence by reacting the nucleic acid extracted in step (a) with a reaction mixture comprising a strand displacement DNA polymerase and a sequence specific primer set, wherein said sequence-specific primer set is selected from the group consisting of Set 29 and Set-1 through Set-28; and

(c) detecting the presence or absence of an amplified product of step (b); wherein the presence of said amplification product is indicative of the presence of β-actin in the test sample.

10. The method of claim 9, wherein

(A) the amplification in step (b) of the target sequence is performed between 60°C and 67°C for less than 30 minutes, preferably for less than fifteen minutes, more preferably for less than twelve minutes, even more preferably for less than nine minutes;

(B) the reaction mixture further comprises a reverse transcriptase;

(C) detecting the presence or absence of the amplification product comprises hybridizing the amplified product with a probe comprising a polynucleotide attached to a label, wherein optionally:

(a) the label is a fluorophore, preferably wherein the fluorophore is covalently attached to a terminus of the polynucleotide;

(b) the labeled polynucleotide comprises (i) a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 6-33 of SEQ ID NO: 135, nucleotides 6-30 of SEQ ID NO: 136, nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140,

nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 143, nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, nucleotides 8-30 of SEQ ID NO: 146, 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-32 of SEQ ID NO: 151, nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 7-25 of SEQ ID NO: 159, nucleotides 8-22 of SEQ ID NO: 160, nucleotides 6-22 of SEQ ID NO: 161, nucleotides 3-22 of SEQ ID NO: 162, nucleotides 8-28 of SEQ ID NO: 163, nucleotides 3-28 of SEQ ID NO: 164, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 3-22 of SEQ ID NO: 170, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 4-23 of SEQ ID NO: 177, nucleotides 4-34 of SEQ ID NO: 178, nucleotides 3-27 of SEQ ID NO: 179, nucleotides 2-27 of SEQ ID NO: 180, nucleotides 5-33 of SEQ ID NO: 181, nucleotides 3-30 of SEQ ID NO: 182, and nucleotides 9-34 of SEQ ID NO: 183; (ii) a sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183;

(c) the labeled polynucleotide comprises a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, and nucleotides 9-34 of SEQ ID NO: 183, and wherein the sequence specific primer set is selected from the group consisting of Set 29, Sets 22-28, Sets 9-12, and Set-17, wherein preferably the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 184, SEQ ID NO: 147, SEQ ID NO: 148, SEQ ID NO: 149, SEQ ID NO: 150, SEQ ID NO: 155, SEQ ID NO: 156, SEQ ID NO: 165, SEQ ID NO: 166, SEQ ID NO: 167, SEQ ID NO: 168, SEQ ID NO: 169, SEQ ID NO: 171, SEQ ID NO: 172, SEQ ID NO: 173,

SEQ ID NO: 174, SEQ ID NO: 175, SEQ ID NO: 176, and SEQ ID NO: 183, and more preferably the sequence of the labeled polynucleotide is SEQ ID NO: 184, and the sequence-specific primer set is Set-29.

11. The method of claim 9 or 10, wherein the labeled polynucleotide comprises:

(a) a sequence selected from the group consisting of nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, and wherein the sequence-specific primer set is selected from the group consisting of Sets 9-11, Set-17, and Sets 23-29, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 152, SEQ ID NO: 153, and SEQ ID NO:154;

(b) a sequence selected from the group consisting of nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, and nucleotides 8-30 of SEQ ID NO: 146, and wherein the sequence-specific primer set is selected from the group consisting of Set-4, Sets 9-12, Set-17, and Sets 22-26, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 144, SEQ ID NO: 145, and SEQ ID NO: 146;

(c) nucleotides 3-22 of SEQ ID NO: 170, and wherein the sequence-specific primer set is selected from the group consisting of Set-5, Set-12, Set-17, and Sets 22-25, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 170;

(d) a sequence selected from the group consisting of nucleotides 2-27 of SEQ ID NO: 180 and nucleotides 3-30 of SEQ ID NO: 182, and wherein the sequence-specific set is selected from the group consisting of Sets 6-8, Set-15, and Set-16, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 180 and SEQ ID NO: 182;

(e) a sequence selected from the group consisting of nucleotides 4-34 of SEQ ID NO: 178 and nucleotides 5-33 of SEQ ID NO: 181, and wherein the sequence-specific primer set is selected from the group consisting of Sets 6-11 and Sets 28-29, wherien optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 178 and SEQ ID NO: 181;

(f) nucleotides 3-27 of SEQ ID NO: 179, and wherein the sequence-specific primer set is selected from the group consisting of Sets 6-9 and Set-11, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 179;

(g) nucleotides 4-23 of SEQ ID NO: 177, and wherein the sequence-specific primer set is selected from the group consisting of Sets 6-9, Set-11, and Set-28, wherein optionally the labeled polynucleotide comprises SEQ ID NO: 177;

(h) a sequence selected from the group consisting of nucleotides 7-25 of SEQ ID NO: 159 and nucleotides 8-22 of SEQ ID NO: 160, and wherein the sequence-specific primer set is selected from the group consisting of Sets 13-15, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 159 and SEQ ID NO: 160;

(i) a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 6-22 of SEQ ID NO: 161, and nucleotides 3-22 of SEQ ID NO: 162, and wherein the sequence-specific primer set is selected from the group consisting of Sets 13-16, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 157, SEQ ID NO: 158, SEQ ID NO: 161, and SEQ ID NO: 162;

(j) a sequence selected from the group consisting of nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 151, and nucleotides 4-24 of SEQ ID NO: 153, and wherein the sequence-specific primer set is Set-3, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 137, SEQ ID NO: 138, SEQ ID NO: 139, SEQ ID NO: 140, SEQ ID NO: 141, SEQ ID NO: 142, SEQ ID NO: 151, and SEQ ID NO: 153;

(k) a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 163 and nucleotides 3-28 of SEQ ID NO: 164, and wherein the sequence-specific primer set is selected from the group consisting of Set-1, Set-2, and Sets 18-20, wherein optionally the labeled polynucleotide comprises a sequence selected from the group consisting of SEQ ID NO: 163 and SEQ ID NO: 164; and/or

(l) the labeled polynucleotide comprises a sequence selected from the group consisting of nucleotides 6-33 of SEQ ID NO: 135 and nucleotides 6-30 of SEQ ID NO: 136, and wherein the sequence-specific primer set is selected from the group consisting of Sets 1-2 and Sets 18-21, wherein optionally the labeled polynucleotide comprises a sequence from the group consisting of SEQ ID NO: 135 and SEQ ID NO: 136.

12. A kit comprising a composition according to any one of claims 1-6 and further comprising a strand displacement polymerase.

13. The kit of claim 12, further comprising a molecular beacon comprising a fluorophore, a quencher, and a polynucleotide, wherein the polynucleotide comprises a sequence selected from the group consisting of nucleotides 8-28 of SEQ ID NO: 184, nucleotides 6-33 of SEQ ID NO: 135, nucleotides 6-30 of SEQ ID NO: 136, nucleotides 7-27 of SEQ ID NO: 137, nucleotides 7-26 of SEQ ID NO: 138, nucleotides 1-26 of SEQ ID NO: 139, nucleotides 7-26 of SEQ ID NO: 140, nucleotides 7-30 of SEQ ID NO: 141, nucleotides 6-30 of SEQ ID NO: 142, nucleotides 8-32 of SEQ ID NO: 143, nucleotides 8-30 of SEQ ID NO: 144, nucleotides 6-31 of SEQ ID NO: 145, nucleotides 8-30 of SEQ ID NO: 146, 8-22 of SEQ ID NO: 147, nucleotides 8-24 of SEQ ID NO: 148, nucleotides 7-27 of SEQ ID NO: 149, nucleotides 8-21 of SEQ ID NO: 150, nucleotides 8-32 of SEQ ID NO: 151, nucleotides 1-24 of SEQ ID NO: 152, nucleotides 4-24 of SEQ ID NO: 153, nucleotides 1-23 of SEQ ID NO: 154, nucleotides 8-26 of SEQ ID NO: 155, nucleotides 7-29 of SEQ ID NO: 156, nucleotides 8-28 of SEQ ID NO: 157, nucleotides 8-29 of SEQ ID NO: 158, nucleotides 7-25 of SEQ ID NO: 159, nucleotides 8-22 of SEQ ID NO: 160, nucleotides 6-22 of SEQ ID NO: 161, nucleotides 3-22 of SEQ ID NO: 162, nucleotides 8-28 of SEQ ID NO: 163, nucleotides 3-28 of SEQ ID NO: 164, nucleotides 5-25 of SEQ ID NO: 165, nucleotides 5-26 of SEQ ID NO: 166, nucleotides 5-20 of SEQ ID NO: 167, nucleotides 4-22 of SEQ ID NO: 168, nucleotides 7-22 of SEQ ID NO: 169, nucleotides 3-22 of SEQ ID NO: 170, nucleotides 7-28 of SEQ ID NO: 171, nucleotides 6-27 of SEQ ID NO: 172, nucleotides 7-29 of SEQ ID NO: 173, nucleotides 5-27 of SEQ ID NO: 174, nucleotides 7-29 of SEQ ID NO: 175, nucleotides 6-28 of SEQ ID NO: 176, nucleotides 4-23 of SEQ ID NO: 177, nucleotides 4-34 of SEQ ID NO: 178, nucleotides 3-27 of SEQ ID NO: 179, nucleotides 2-27 of SEQ ID NO: 180, nucleotides 5-33 of SEQ ID NO: 181, nucleotides 3-30 of SEQ ID NO: 182, and nucleotides 9-34 of SEQ ID NO: 183,

wherein preferably the polynucleotide comprises or consists of a sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183, and more preferably wherein the polynucleotide consists of SEQ ID NO: 184 and the set of polynucleotides is Set-29.

14. The method of detecting β-actin of any one of claims 9-12, wherein step (b) comprises amplifying a target sequence by reacting nucleic acid extracted in step (a) for less than ten minutes with a reaction mixture comprising a strand displacement DNA polymerase and a

sequence specific LAMP primer set; and wherein said sequence-specific primer set is selected from the group consisting of Set-29 and Set-1 through Set-28.

15. The method of claim 14, wherein:

(a) detecting the presence or absence of the amplification product comprises hybridizing the amplified product with a molecular beacon comprising a polynucleotide sequence selected from the group consisting of SEQ ID NO: 184 and SEQ ID NO: 135 through SEQ ID NO: 183; or

(b) detecting the presence or absence of the amplification product comprises hybridizing the amplified product with a molecular beacon comprising a polynucleotide sequence selected from the group consisting of SEQ ID NO: 184, SEQ ID NO: 147, SEQ ID NO: 148, SEQ ID NO: 149, SEQ ID NO: 150, SEQ ID NO: 155, SEQ ID NO: 156, SEQ ID NO: 165, SEQ ID NO: 166, SEQ ID NO: 167, SEQ ID NO: 168, SEQ ID NO: 169, SEQ ID NO: 171, SEQ ID NO: 172, SEQ ID NO: 173, SEQ ID NO: 174, SEQ ID NO: 175, SEQ ID NO: 176, and SEQ ID NO: 183.