

What is claimed is:

1. A composition comprising:

a mixture comprising:

an RNA stabilization buffer comprising:

- (a) guanidine hydrochloride at a concentration of at least 4.5 M;
- (b) t-Octylphenoxypolyethoxyethanol at a concentration of at least 0.1% (v/v);
- (c) EDTA at a concentration of at least 20 mM;
- (d) citric acid at a concentration of at least 80 mM;
- (e) sodium citrate at a concentration of at least 120 mM;

wherein the pH of the RNA stabilization buffer is between 4.05 and 4.11;
and

a biological sample isolated from a subject,

wherein the mixture comprises the biological sample and the RNA stabilization buffer at a ratio of 1:2 (v:v),

wherein the mixture is in a sample collection tube that is pre-coated with K2-EDTA such that the concentration of EDTA in the mixture is at least 40 mM.

2. A method of stabilizing RNA in a biological sample from a subject, the method comprising contacting the biological sample and an RNA stabilization buffer at a ratio of 1:2 (v:v),

wherein the RNA stabilization buffer comprises:

- (a) guanidine hydrochloride at a concentration of at least 4.5 M;
- (b) t-Octylphenoxypolyethoxyethanol at a concentration of at least 0.1% (v/v);
- (c) EDTA at a concentration of at least 20 mM;
- (d) citric acid at a concentration of at least 80 mM;
- (e) sodium citrate at a concentration of at least 120 mM;

wherein the pH of the RNA stabilization buffer is between 4.05 and 4.11,

wherein the biological sample and the RNA stabilization buffer are contacted in in a sample collection tube pre-coated with K2-EDTA such that the final concentration of EDTA is at least 40 mM.

3. The composition of claim 1 or the method of claim 2, wherein the RNA stabilization buffer comprises:

- (a) guanidine hydrochloride at a concentration of 4.5 M;
- (b) t-Octylphenoxypolyethoxyethanol at a concentration of 0.1% (volume/volume);
- (c) EDTA at a concentration of 20 mM;
- (d) citric acid at a concentration of 80 mM; and
- (e) sodium citrate at a concentration of 120 mM,

wherein the pH of the stabilization buffer is between 4.05 and 4.11.

4. The composition of claim 1 or 3, or the method of claim 2 or 3, wherein the biological sample comprises blood, plasma, serum, urine, breast milk, cerebrospinal fluid, mucus, gastric juice, peritoneal fluid, pleural fluid, saliva, sebum, semen, sweat, tears, vaginal secretion, vomit, endolymph, perilymph or any combination thereof.

5. The composition or the method of claim 4, wherein the biological sample is a blood sample, preferably wherein the blood sample is:

- a) a whole blood sample obtained by venipuncture; or
- b) a blood sample obtained by finger prick.

6. The composition or the method of claim 4, wherein the biological sample is a saliva sample.

7. The composition of any one of claims 1 and 3-6 or the method of any one of claims 2-6, wherein the sample collection tube is a 6ml, 16x100 mm sample collection tube.

8. The composition of any one of claims 1 and 3-7 or the method of any one of claims 2-7, wherein the biological sample comprises at least one RNA transcript, wherein the expression level of the at least one RNA transcript in the stabilized biological sample measured after incubating the stabilized biological sample for at least 24 hours at room temperature is within 5% ($\pm 5\%$), preferably within 1% ($\pm 1\%$), preferably within 0.5% ($\pm 0.5\%$) of the expression level of the at least one RNA transcript as measured no more than 1 hour after the sample was collected.

9. The composition or method of claim 8, wherein the expression level of the at least one RNA transcript is measured using quantitative PCR.