

SUMMARY

[0004] The present ~~invention~~disclosure relates to organ and tissue preservation solutions also referred to as Lazarus and Somah formulations having improved stability and increased shelf life when compared to the original formulations. Also described are methods of using the improved formulations. In an aspect, there is provided a kit for preserving the function of a tissue or organ comprising: a first container containing a first solution, wherein the first solution is comprised of water, a balanced salt solution, a sugar, adenosine, orotic acid, malic acid, and L-carnitine and has a pH of at least 7; a second container containing a second solution, wherein the second solution is comprised of water, an antioxidant, a reducing agent, L-citrulline, creatine, L-carnosine, and L-arginine and has a pH of below 7. In another aspect, there is provided a method of preparing a formulation for preserving the function of a tissue or organ comprising: providing a first solution wherein the first solution includes water, a balanced salt solution, a sugar, adenosine, orotic acid, malic acid, and L-carnitine and has a pH of at least 7; providing a second solution, wherein the second solution includes water, an antioxidant, a reducing agent, L-citrulline, creatine, L-carnosine, and L-arginine and has a pH of below 7; and mixing the first solution with the second solution to form the complete formulation for preserving the function of a tissue or function. In yet another aspect, there is provided a method of preserving the function of a tissue or organ comprising: providing a first solution wherein the first solution includes water, a balanced salt solution, a sugar, adenosine, orotic acid, malic acid, and L-carnitine and has a pH of at least 7; providing a second solution, wherein the second solution includes water, a reducing agent, and an antioxidant, L-citrulline, creatine monohydrate, L-carnosine, and L-arginine and has a pH of below 7; mixing the first solution with the second solution to form the complete formulation for preserving the function of a tissue or function; and contacting a tissue or organ with the complete formulation.

[0005] According to the present ~~invention~~disclosure, Lazarus and Somah formulations with extended shelf lives can be prepared by forming a first solution having a pH of at least 7 and a second solution having a pH of less than 7. The first solution includes components with improved stability when stored at a pH of 7 or above, and the second solution includes components with improved stability when stored at a pH below 7. The first solution includes water, a balanced salt solution, a sugar such as D-glucose, mannose, and fructose, adenosine, orotic acid, malic acid, L-carnitine, and insulin at a pH of at least 7 and preferably at a pH that ranges from pH 7 to about pH 9. The first solution may optionally include sodium dichloroacetate. Formulations intended for use with cardioplegia may also include an additional amount of KCL in the first solution. The second solution includes water, an antioxidant such as ascorbic acid, a reducing agent such as reduced glutathione, L-citrulline, creatine, L-carnosine, and L-arginine at a pH of less than 7.0 and preferably from pH 6.8 to about pH 6.4. At the point of use, the

first and second solutions are mixed together to form a final formulation that can be used at a physiological pH of around pH 7.4 to preserve the function of the tissue or organ.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate various embodiments of the invention and, together with a general description of the invention given above and the detailed description of the embodiments given below, serve to explain the embodiments of the invention.

[0007] FIG. 1 is a perspective view of a multi-chamber bag in accordance with embodiments of the invention.