

The application of AQIX® RS-I solution in a Kit Method for Storage and Transport of Isolated Tissue Biopsy Samples

Preamble:

It is important to note that AQIX® RS-I, is a **NON** phosphate buffered solution. Therefore, for *in vitro* experimentation, the dilution, preparation, and utilization processes are different to conventional phosphate-buffered saline solutions.

The following information is intended to assist the operator to maximize the performance of AQIX® RS-I solution for the storage, transportation and, ultimate normothermic perfusion using AQIX® RS-I, of isolated animal and human cadaver biopsied tissues and organs utilized in physiological and pharmacological research. Good laboratory practice must be adhered to throughout the complete process.

1. Storage of AQIX® RS-I solution

Ready-to-use (1x) solutions of AQIX® RS-I have a pH of 7.25 ± 0.05 @ RTP and can be stored at 3 - 8 °C in suitable sealed, glass or plastic polymer containers for periods of up to 8 weeks without any change in pH or precipitation of calcium or magnesium salts.

Ready-to-use (1x) solutions of **carbogenated** AQIX® RS-I solutions prepared under sterile conditions can be kept for up to **two weeks** when stored in suitable, sealed containers at 3 - 8 °C.

Storage of non-aerated or aerated (**carbogenated**) AQIX® RS-I solution for periods in excess of **2 weeks** will depend upon the addition of suitable antibiotic and antifungal agents.

2. Procedures for the Storage/Transportation of Organ and Tissue Biopsies

2.1 Hypothermic [3 – 10 °C] Procedure:

2.1.1 Organs;

a) Whole cadaver organs (e.g., heart; kidney; liver; brain; pancreas) should be flushed via the vasculature with ‘warm’ [+30 °C] AQIX® RS-I solution or, more preferably, with ‘warm’ AQIX® RS-I solution, previously aerated for 30 minutes with **carbogen** [95% O₂ / 5% CO₂], to remove any residual blood and cell debris.

b) The perfused organs may then be either:

i) totally immersed in ‘cold’ [3 - 10 °C] AQIX® RS-I solution within a suitable, sealed container during transportation in a polystyrene, outer container over ‘wet’ ice [0 - 4 °C], or,

ii) continuously, machine perfused with AQIX® RS-I solution at 10 - 15 °C during storage.

c) Transportation times of 24 – 120 hours are permissible if temperatures of 4 - 15 °C are maintained throughout this procedure and dependant upon the storage and transportation methods deployed.

2.1.2 Organ Segments;

- a) Segments of cadaver organs (e.g., lobes/bronchi of lung, liver; colon; intestine; atria; bronchi) should be flushed with 'cold' [3 - 10 °C] AQIX® RS-S solution or, more preferably, with 'cold' AQIX® RS-I solution previously aerated for 30 minutes with *carbogen* [95% O₂ / 5% CO₂] to remove any residual blood and cell debris.
- b) The organ segments are then totally immersed in 'cold' [3 - 10 °C] AQIX® RS-I solution within a suitable, sealed container during transportation in a polystyrene, outer container over 'wet' ice [0 - 4 °C].

2.2 Mild-Hypothermic [15 – 25 °C] Procedure:

- a) Organ segment biopsies [2-4 cm²] or small [0.5 - 2 cm] tissue biopsies should be rinsed thoroughly with AQIX® RS-I solution at ambient temperatures conditions and then placed into a suitable, sealed container containing fresh, carbogenated AQIX® RS-I solution for transportation under ambient temperature conditions [15 – 25 °C].
- b) Transportation times of 24 – 36 hours are permissible if storage/transportation temperatures of < 25 °C are maintained throughout this procedure.

3. Re-animation of Tissue Biopsy Samples using AQIX® RS-I solution

Biopsy tissue preparations previously stored and transported in AQIX® RS-I (1x) solution are re-animated in 5-20mL organ bath chambers under normothermic conditions using AQIX® RS-I (1x) solution. A perfusion rate of **1 – 4** ml/minute at 32 – 38 °C is recommended. Resumption of functional activity of the biopsied preparations occurs within 30 – 60 minutes of normothermic perfusion.

Important information

In comparing AQIX® RS-I to other perfusate solutions it is important to note that the majority of conventional perfusion solutions utilize phosphate ions as a pH buffering agent. Although there may be some apparent short-term benefit, the presence of inorganic phosphate ions has been reported to cause deleterious and irreversible alterations in cell structure and numerous biochemical processes over time.

One of the unique, patented features of AQIX® RS-I solution is the absence of inorganic phosphate ions and to use instead, natural pH buffering, namely, the P_{CO₂}/HCO₃⁻ mechanism. It is therefore vital to ensure that in any comparative test no trace contamination of phosphate ions exists by replacing all containers, line-feeds and other apparatus when changing to AQIX® RS-I perfusate.

For further information on this preservation and perfusion solution and other AQIX® solution products refer to www.AQIX.com or contact:

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