

The Mandate for Tissue Preservation †

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† Presented at 1st OncoHub Conference – Connecting Scientists for Next Generation Cancer Management (13-15 October 2021, virtual)

Received: 25.10.2021; Accepted: 5.02.2022; Published: 14.02.2022

Abstract: Preservation of tissue structure and its molecular components and specifically of the antigenic features and the nucleic acid sequences, is a prerequisite to undergoing study and diagnostic analysis of pathological tissues. The use of formalin fixation, once regarded as the gold standard, must now be adapted and modified to meet new requirements. The most critical steps potentially affecting tissue preservation are: 1) The Cold ischemia time, i.e., the time interval between removal of the biopsy from the body and the completion of the fixation process, and 2) the fixation mechanism. When tissues are immersed in a fixative, the penetration process is rather lengthy. It derives that small specimens (such as core biopsies) are immediately fixed, while in surgical specimens, the inner areas undergo a lytic process which can, however be monitored by reducing the temperature. In our experience, the under-vacuum sealing and cooling procedure allows optimal tissue preservation and should be recommended for transferring surgical specimens. Formaldehyde is still adopted by pathologists as the fixative of choice, despite its toxicity and carcinogenicity. Special care is demanded in managing this reagent, and its substitution is desirable, provided that a similar fixation is reached. We have found that Glyoxal, a non-toxic aldehyde, provides morphological and molecular results similar to those obtained using formaldehyde, provided that deleterious acids are removed. We have now conducted a European Trial and reached the validated conclusion that the glyoxal acid-free (GAF) fixative is “not inferior” to formalin.

Keywords: tissue preservation; fixation; formalin; glyoxal acid-free;

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Funding

Not applicable.

Acknowledgments

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.