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Short Communication

CelLock™: A Neoteric Standardized Cell-Block Procedure

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ABSTRACT

An innovative standardized method for collecting individual cells and small tissue fragments for subsequent routine, immunohistochemical and molecular pathology diagnostic and investigative techniques has been reported. The CelLock™ method, which utilizes a novel product CelLGel™, results in the collection and retention of 99.9% of the original specimen within a paraffin embedded cell-block. The resulting tissue sections retain all of the morphologic, proteomic and genomic information necessary for pathological diagnosis and investigation.

Keywords: CelLock™; CelLGel™; Molecular pathology; Cytology; Histology; Fine needle aspiration; *In situ* hybridization; Immunohistochemistry; Cell-block

DESCRIPTION

Molecular biology and pathology methods continue to be developed at a rapid pace. These techniques are used to identify molecular biomarkers which can be used to not only diagnose diseases, but to help establish specific individualized treatment protocols which can improve prognosis [1].

Lung adenocarcinoma is an example in which a specimen obtained by fine needle aspiration or bronchoalveolar lavage can be processed into a cell-block and the resulting stained slides used to render an accurate histopathological diagnosis [2]. Additional slides from the cell-block can be stained with immunohistochemical methods to determine such diagnostic and predictive immunomarkers as TTF1 and TS, respectively [3].

Endometrial carcinoma exists in at least three different subtypes. Each subtype represents a different prognosis and treatment for the patient. Several different genes are involved and include mutations of *PTEN* and *c-erB-2*, among others. Many of these mutations can be detected using immunohistochemical techniques. The information provided to the clinician by the endometrial biopsy pathology diagnosis can be used to assist the determination of the prognosis [4].

In order to obtain this valuable and critical molecular information, it is imperative that histopathology laboratories employ the very best techniques for receiving and processing these specimens into cell-blocks that contain the entirety of the patient specimen. Additionally, the specimen must retain all histopathological, genomic and proteomic information. Currently, there is not a standardized cell-block method that is utilized by all laboratories. Most laboratories use in-house procedures [5]. While each of these procedures varies, they all have one thing in common: none of the current cell-block methods preserves the entire original specimen in its entirety [6-8]. A portion of the original specimen is lost or discarded during the cell-block procedure. One study calculated that the percentage of cell-block cases signed out as "Quantity Not Sufficient" (QNS) was found to be as high as 64% [9]. Clearly the myriad of in-house different cell-block preparation procedures are not optimal and there is a need for standardization of the methodology [10].

The CelLock procedure for preparing cell-blocks is simple [11], inexpensive and effective. The procedure can be used for cytology, fine needle aspirates, cell suspensions and tiny histology specimens. It makes use of an initial manual filtration apparatus whereby 99.9% of the total submitted specimen is collected and retained on a proprietary filter. The specimen is then immobilized on top of the filter using CelLGel™ a proprietary gelatin based material that is applied after liquefaction using heat, and then allowed to cool (2-5 minutes) into a gelatin consistency.

The entire filter, with the entire specimen locked into the CelLGel™, is placed into a tissue processing cassette and processed using a standard closed system tissue processor for routine paraffin processing and embedding. During the embedding

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process, the filter is included in the resulting paraffin block to ensure that the entire specimen is present within. Additionally, the filter serves as a visual cue to the histologist to assist embedding and to indicate when to begin taking sections after facing off the paraffin block during microtomy. The resulting sections are picked up on coated microscope slides and can be stained using Hematoxylin and Eosin (H&E), special stains (including enzyme stains), immunohistochemistry stains and in situ staining methods.

CONCLUSION

The review of the Original Research article contained herein confirms that the author has developed a novel standardized method for the preparation of cell-blocks. This method provides optimal receipt, collection and preservation of 99.9% of the total of the specimen submitted to the laboratory. Existing, routine histopathological methods can then be used to process and embed the specimen into a cell-block. The resulting cell-block sections can be consistently and reproducibly stained with immunohistochemical and *in situ* staining methods, as well as the usual routine H&E and special stains. The histopathological, proteomic and genomic information contained within the cells of the cell-block sections is optimally preserved for any protein or nuclear assays which need to be conducted.

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