Locking Tissue Orientation from Grossing Through Review with Tissue-Tek® Paraform® Tissue Orientation Gels

Continuous Innovation For Pathology

Douglas T. Yamanishi PhD, Lydia E. Figueroa HTL(ASCP), Cliff Hom, Carlos Sanchez HT, Luis Chavez HT, Julie A. Galindo HT(ASCP), Erico von Bueren PhD MD MOR

Sakura Finetek USA, Inc., Torrance, CA

Introduction

Background

Pathologists, Pathologist Assistants, and Histologists are challenged with orienting and locking small tissue specimens in cassettes at grossing and embedding. If not oriented correctly, the tissue sections may not be adequate for the Pathologist to diagnose and require time consuming re-work. Sakura developed Tissue-Tek® Paraform® Tissue Orientation Gels for locking location and orientation of specimens at the time of grossing; thus eliminating the need to orient the processed specimens downstream during manual or fully automated embedding. The grossed biopsies and small specimens such as shaves, arteries, or nerves are placed into the precast gels in the desired orientation. The oriented cassette is processed and embedded without further manipulation.

Design

A study was performed to confirm that the Tissue Orientation Gels lock the location and orientation of specimens from grossing to review. Small biopsies were processed and embedded. The specimen blocks were sectioned, stained and coverslipped. The location and orientation of the specimens were documented and reviewed throughout the sequential stages.

Results

Tissue Orientation Gels were used with the Tissue-Tek® Paraform® Biopsy Cassettes to lock the location and the orientation of specimens by keeping them in one plane, and preventing specimen loss or migration (movement) and preventing re-embedding.

Conclusion

The use of the Tissue Orientation Gels in combination with the Paraform Sectionable Cassette System may become a new tool in the hands of the Pathologist to prevent tissue loss, reduce re-embedding, save costs and time, and increase slide review efficiency.

Materials and Methods

Tissue Processing and Embedding

Skin, kidney, or gastrointestinal specimens were fixed. Tissue was grossed using blades, a 17 gauge needle or a 2.5-mm punch. Tissue Orientation Gels (only available for evaluation in the USA) were placed into Paraform Biopsy Cassettes with Frames preprinted using the Tissue-Tek® AutoWrite® Cassette Printer (Sakura Finetek USA, Torrance, CA), then the specimens were placed into the Tissue Orientation Gels. Cassettes were soaked in Tissue-Tek Xpress® Pre-Processing Solution (Sakura Finetek USA, Torrance, CA) for 30 minutes and then in Tissue-Tek Xpress® Molecular Fixative (Sakura Finetek USA, Torrance, CA) for 2 minutes. Cassettes were loaded into the Tissue-Tek Xpress® *x120* Rapid Tissue Processor and the standard protocol was run. The cassettes were embedded using the Tissue-Tek AutoTEC® *a120* Automated Embedder (Sakura Finetek USA, Torrance, CA) and sectioned using the Tissue-Tek AutoSection® Fully Automated Microtome (Sakura Finetek USA, Torrance, CA).

Tissue Staining

Tissue sections were Hematoxylin and Eosin (H&E, Medical Chemical Corp., Torrance, CA) stained using Tissue-Tek Prisma® Automated Slide Stainer (Sakura Finetek USA, Torrance, CA) and the slides were coverslipped using the Tissue-Tek Film® Coverslipper (Sakura Finetek USA, Torrance, CA). Some tissue sections were immunohistochemically (IHC) stained using antibodies to pan-cytokeratin (Genemed, South San Francisco, CA) with a Hematoxylin counterstain. The slides were dehydrated and coverslipped, then images of them were taken using the VisionTek® Digital Microscope (Sakura Finetek USA, Torrance, CA).

Results

- Spatial location and orientation of specimens was secured and locked from grossing through slide review
- Tissue Orientation Gels accommodate placement of different tissue types and sizes
- Multiple specimens can be placed into one cassette
- Specimens can be aligned into one plane
- They are colorized to maximize the contrast between Tissue Orientation Gels and specimens during grossing; the color is removed prior to slide review
- Cassettes no longer need to be opened after grossing, which minimizes the related risk of specimen loss
- Specimens are no longer manipulated in embedding, preventing the related change of location and orientation

Images of blocks or sections at sequential stages from grossing to slide review

Figure 1. Kidney biopsies placed into Tissue Orientation Gels

Spatial location, orientation, and alignment into one plane is retained from grossing through slide review. Note the contrast between lane and punch and the Tissue Orientation Gel matrix in H&E.

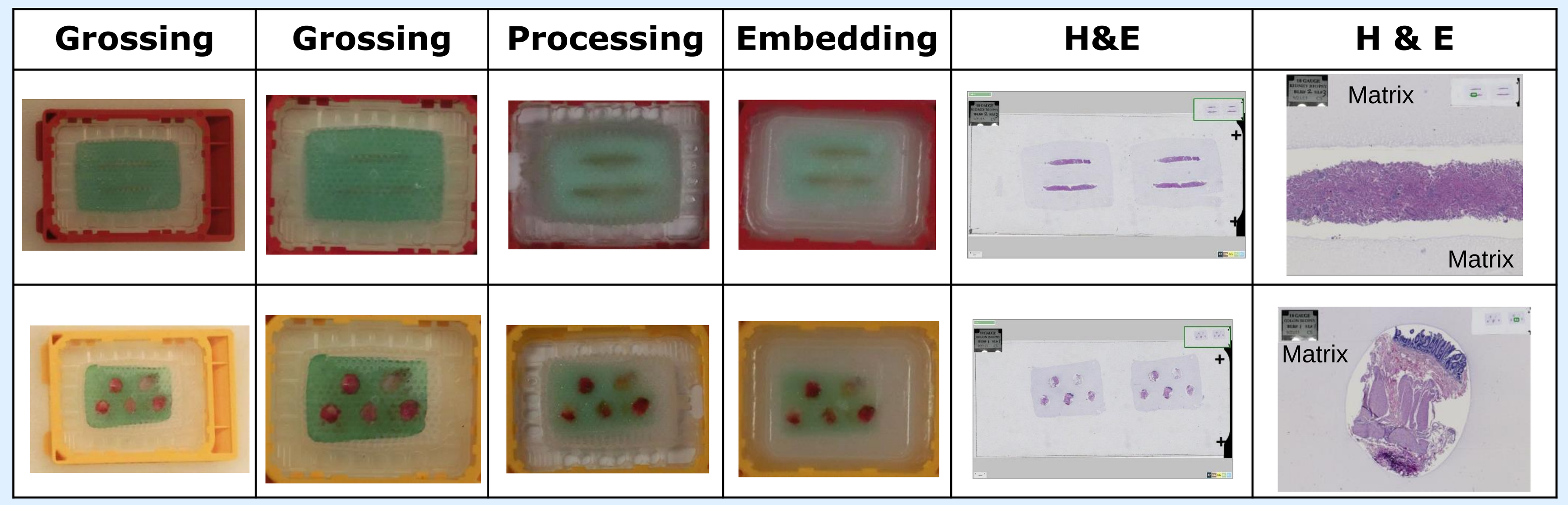
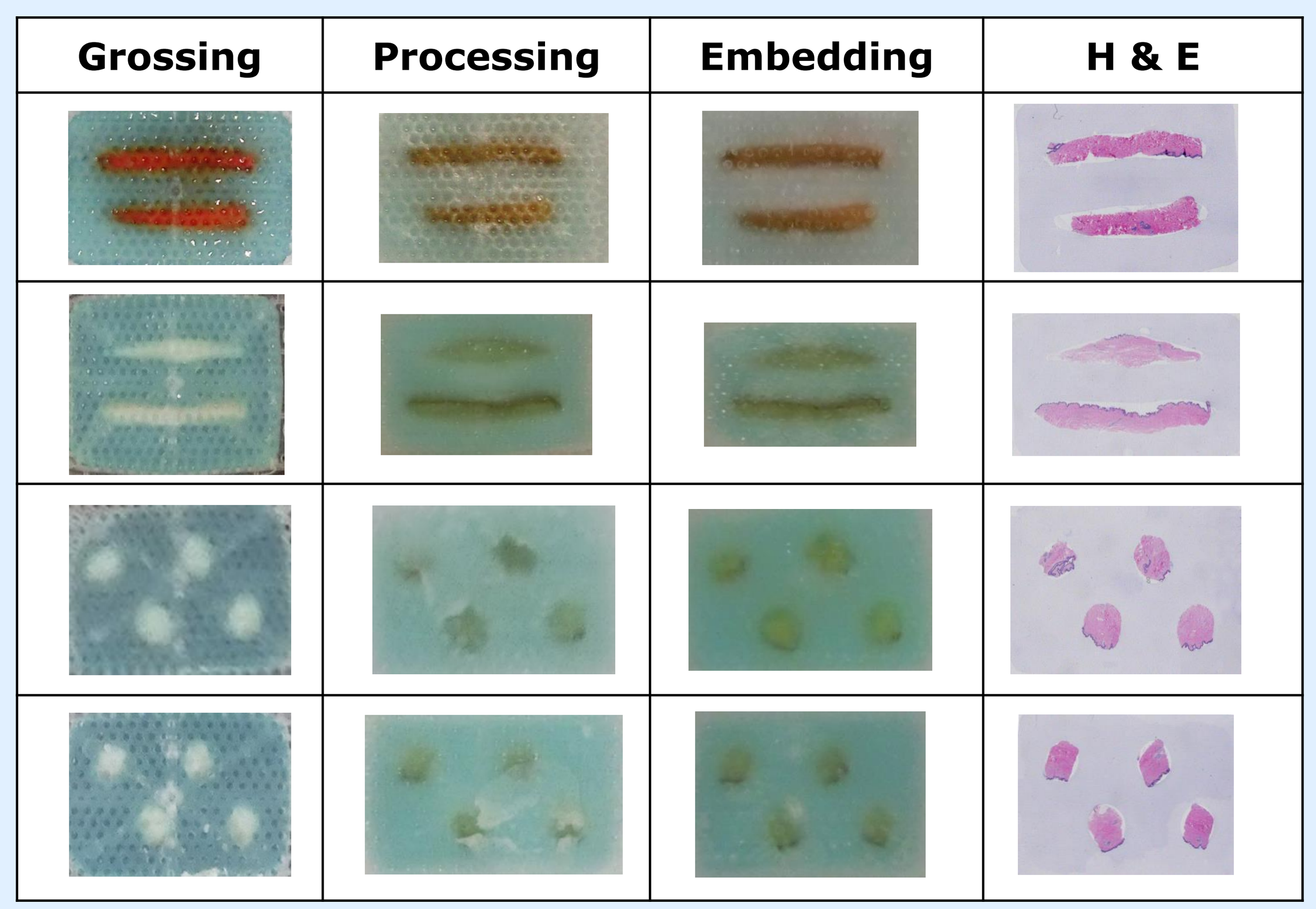


Figure 2. Skin biopsies placed into Tissue Orientation Gels

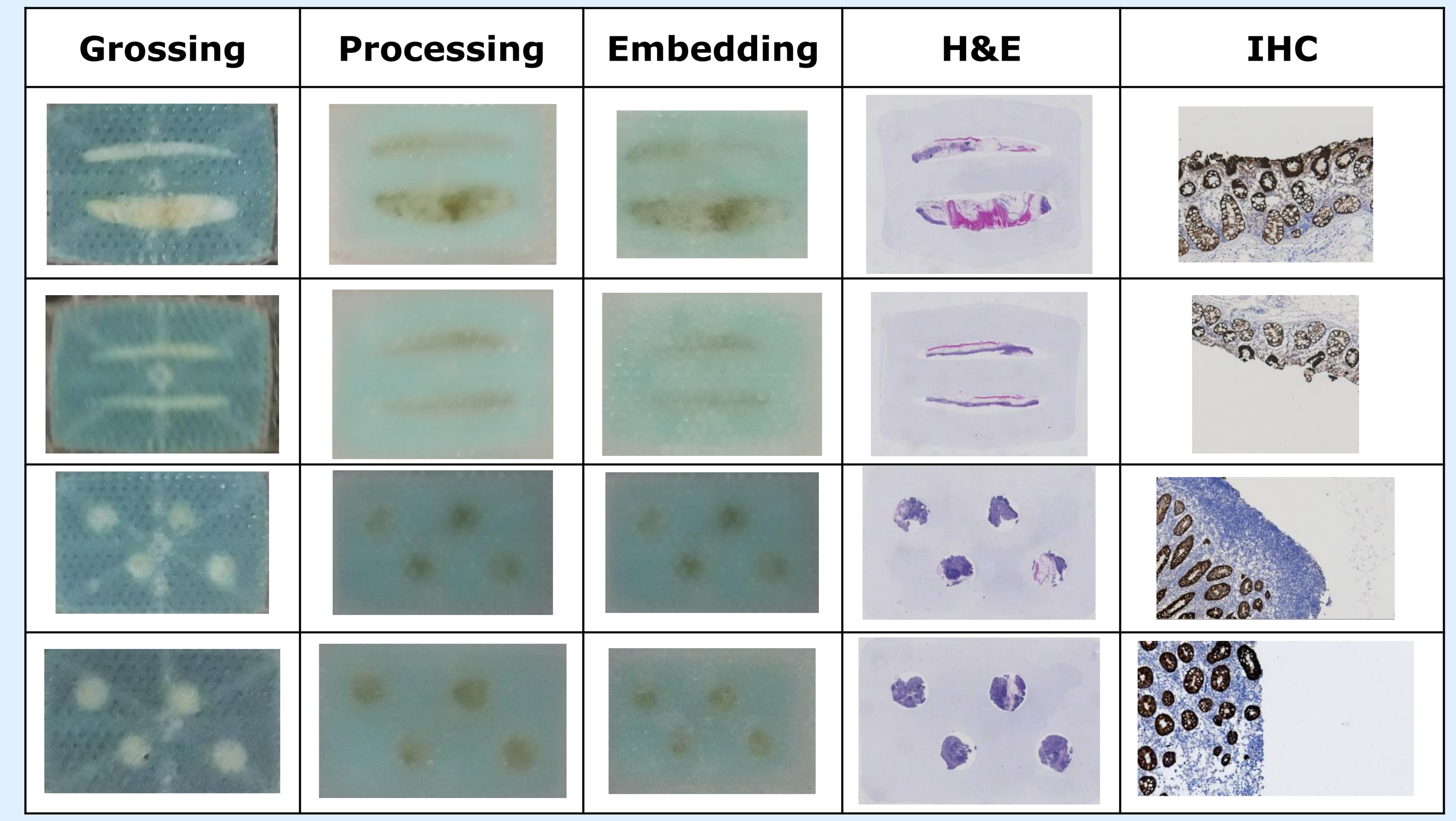
Spatial location, orientation, alignment into one plane and distance between the lanes and punches is retained from grossing through slide review.



Results

Figure 3. Intestine biopsies placed into Tissue Orientation Gels

Spatial location, orientation, and alignment into one plane is retained from grossing through slide review. Note the planar view of the lanes and punches for IHC.



Conclusions

The use of Tissue Orientation Gels in combination with the Paraform Sectionable Cassette System:

- Allows Pathologists and Pathologist Assistants to take full control of spatial location and orientation of specimens at grossing
- Minimizes the risk of specimen loss by locking the specimen at grossing and by removing the need to open the cassette at embedding
- Retains location, orientation, and alignment of the specimens into one plane after grossing
- Decreases Pathologist's review time and laboratory costs[1] by placing multiple specimens into fewer cassettes

References

1. Continuous Specimen Flow Changes Night Shifts To Day Shifts While Reducing Turn-Around-Time (TAT) M. deBram-Hart, E. von Bueren, B. Wander, M. Fussner, C. Scancich, C. Reed, C. Cockerell. Poster at the National Society of Histotechnology Annual Symposium/Convention 2015.

Contact Information

Douglas Yamanishi, PhD
Senior Marketing Manager, Advanced Staining
+1 310-972-7800 x8091
DYamanishi@SakuraUS.com

Booth #1130

Sakura Finetek USA, Inc.
1750 West 214th Street
Torrance, CA 90501

0007829-01 Rev.A