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White Paper

Shelf-Stable Schiff's Reagent: Saving Time Without Compromise

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Background

The Periodic Acid Schiff (PAS) stain is a helpful and widely used special stain in the histology lab. The PAS stain can be used in a diverse range of diagnoses mainly in routine lab diagnostic procedures. This improved staining method is used for the detection of aldehyde and mucosubstances in microscopy, for example, histological sections of the intestine or liver. Schiff's reagent, an important part of the PAS stain, is available from most vendors as a refrigerated reagent. One of the most time consuming parts of the PAS protocol, is the time spent allowing the Schiff's reagent to come to room temperature prior to its use in the stain. This study analyzes a shelf-stable Schiff's reagent (Schiff's Reagent Intense) and compares the staining results and potential time savings this reagent allows with other storage conditions.

Design

Kidney and intestinal tissue samples (Figures 1A and 1B) representing positive PAS staining controls, were stained by the same protocol using the PAS stain and the Schiff's Reagent Intense. Three temperature groups, 4°C (control refrigerated), 25°C (room temp) and 40°C (hot), had staining evaluated over a 36 month period. Each sample was microscopically evaluated by a pathologist and given a staining score of both signal and background using the following 0-4 scale: 0 = negative, 0.5-2.5 = low intensity and 3-4 = moderate to high intensity.

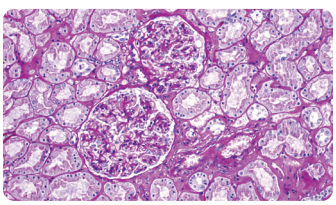


Figure 1A: Kidney

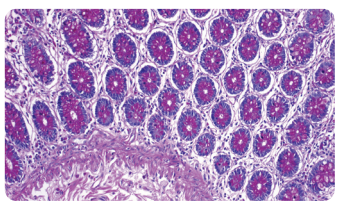


Figure 1B: Intestine

Figure 2A:

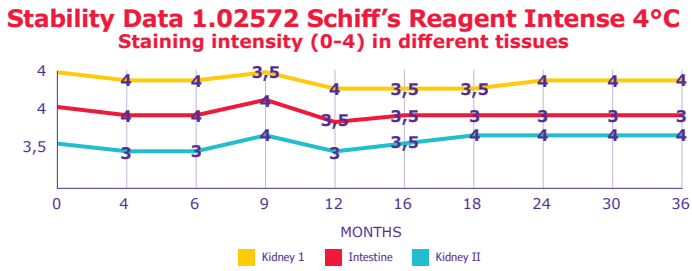


Figure 2B:

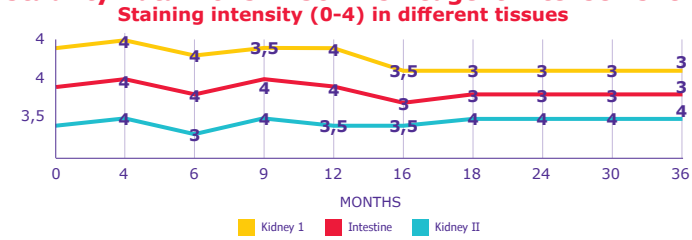
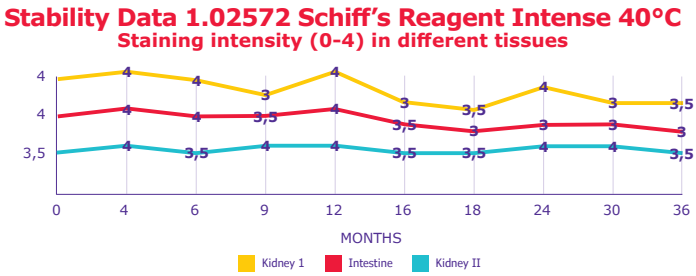


Figure 2C:



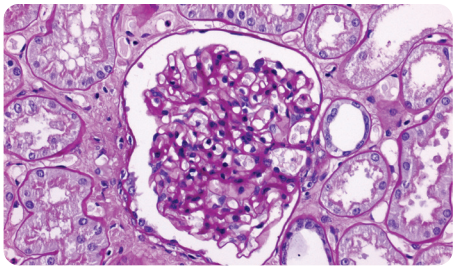


Figure 3A: 4°C

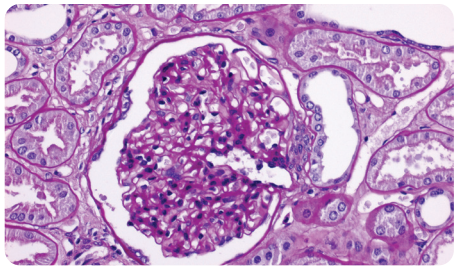


Figure 3B: 25°C

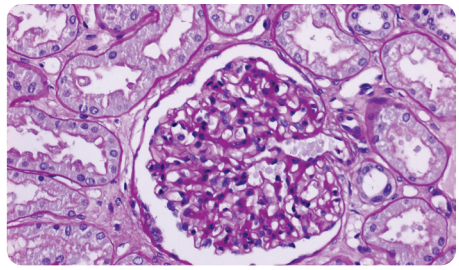


Figure 3C: 40°C

Results

Each of the three temperature groups had strong positive staining throughout the span of the study (Figures 2A, 2B and 2C). The staining in the kidney control is comparable for each of the temperature ranges (Figures 3A, 3B and 3C). The protocol from start to coverslip totaled 42 minutes. When comparing the protocol from the non-room temperature storage conditions, both the 4°C and the 40°C utilized the same 42 minute active protocol but had an added 9 hours and 14 minutes and 6 hours and 36 minutes respectively for the Schiff's reagent to fully normalize to room temperature.

Conclusion

The PAS stain is a useful special stain regardless of reagents and storage; however the time difference in overall protocol length using a shelf-stable Schiff's reagent is valuable. The Schiff's Reagent Intense not only provided strong, consistent staining across multiple tissues and storage conditions, it did so over the course of 36 months. Considering storage conditions, with refrigeration, without refrigeration, and heated storage, the only notable difference was the overall procedure time, created from the Schiff's reagent temperature normalization. The shelf-stable Schiff's provided a reagent and protocol, ready to stain at the technician's discretion, and an overall time savings.

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