

Preventing damage to shared use slide scanners: A systematic study of factors that affect curing of commercially-available hard set mounting medias

Imaging

Laura Lewis-Tiffin (lewistiffin.laura@mayo.edu), Mayo Clinic, **Brandy Edenfield**, Mayo Clinic, **Anneliese Hill**, Mayo Clinic

Many digital pathology applications rely on whole slide scanning of tissue sections stained by Immunohistochemistry (IHC) or Immunofluorescence (IF). Different slide scanners vary in how they handle samples, with some scanning slides in a horizontal position, and others in a vertical position. When scanning slides vertically, fully-cured, hard-set mounting media is required to prevent damage to both slides and scanner. Recently, our facility noticed an increase in slides that were not fully cured despite client claims of using hard-set mounting media with standard coverslipping protocols. For IF samples, these protocols include post-cure storage in the dark, at or below four degrees Celsius. In an effort to provide standardized sample-preparation guidance, we compared performance of four mounting medias that are vendor-defined as hard-curing. We investigated parameters that might affect curing to a permanent solid state, including thickness of coverslipped tissue, mounting media curing time at room temperature, and subsequent sample storage time at 4 degrees Celsius. Testing at each time point consisted of manual attempts to push the coverslip off the tissue. Samples passed to the next testing phase if the coverslip could not be displaced beyond the boundary of the slide. The four mounting medias performed unequally, with two failing all tests despite being sold as hard-set. For the remaining two, we determined that sample thickness had no effect, and curing time at room temperature was the most important factor. However, we repeatedly observed that fully cured samples stored at 4 degrees Celsius would re-soften and then fail subsequent push tests. None of the investigated factors affected this outcome, which the vendors also could not explain. As a result of this study, our facility has instituted strict rules for vertical slide scanning sample preparation, which include a mandatory two day, room temperature re-curing step for slides stored at 4 degrees.