

Automated Section Mounting with the Aquaro ASM™ reduces error and contamination



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Introduction

While much of the histology workflow has options for automation, microtomy — the cutting of histological sections and mounting on microscope slides — has remained a largely manual process. Reliance on manual processes can introduce errors, a lack of consistency, and potential contamination by extraneous paraffin and tissue. Performing the step manually is also a cause of repetitive motion injuries.

Future technologies, especially in imaging, will require error free slides and consistency of section placement. Digital imaging and 3D-reconstruction are two technologies that are best served by slides without folds, extraneous paraffin and/or tissue from the water bath, and slides with consistent section placement.

The Aquaro ASM, a device for Automating Section Mounting, fully automates the microtomy workflow. Utilizing an existing motorized microtome, the device signals the microtome to cut a section, and uses a jet of water to release the section from the blade. Filtered, recirculated water floats the section down the ramp to a “basket” where warm water relaxes the section. Water temperature and time on the water are both controlled by the user and entered into the system via the touch pad interface. Sections are mounted in a pre-determined position on the slide, and mounting is accomplished via a robotic arm. This hands-free microtomy provides a consistency of section thickness through the motorized operation of the microtome, and ensures that each section is treated in exactly the same way when relaxing on the water bath.

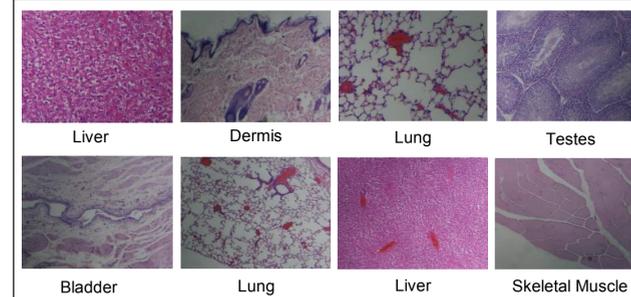


Aquaro ASM utilizes a motorized microtome for automated sectioning and mounting of sections.

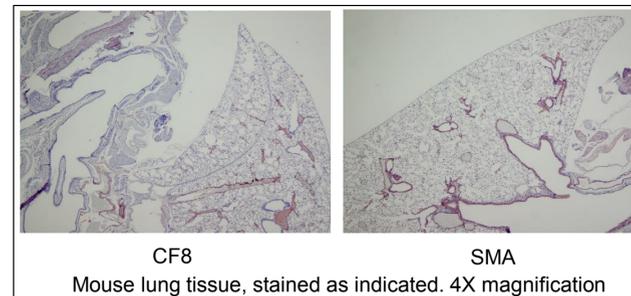
- Programming via an intuitive touch screen
 - Number of sections per slide
 - Number of levels and depth between levels
 - Location of sections: Top, Middle, Bottom
 - Temperature of the water and time on the water for consistent relaxing of the sections
 - Gives visual status updates, along with both audio and visual signals to indicate run status or an error
 - Processes can be paused and restarted, or paused and cleared
 - Stores up to 99 programs which can be saved and moved between devices using a MicroSD storage card
 - Programming of the microtome (e.g. section thickness) is done via the microtome user interface
- Constant filtration of circulating water removes particles of paraffin larger than 20 microns
- Small footprint, 9.5 x 9.5 inches (24.1 x 24.1 cm)
- Useful for all routine work as well as
 - Sectioning whole blocks containing tissue for drug toxicity studies
 - Sectioning with defined levels
 - Preparing control slides
- Fits seamlessly into existing workflows

Examples

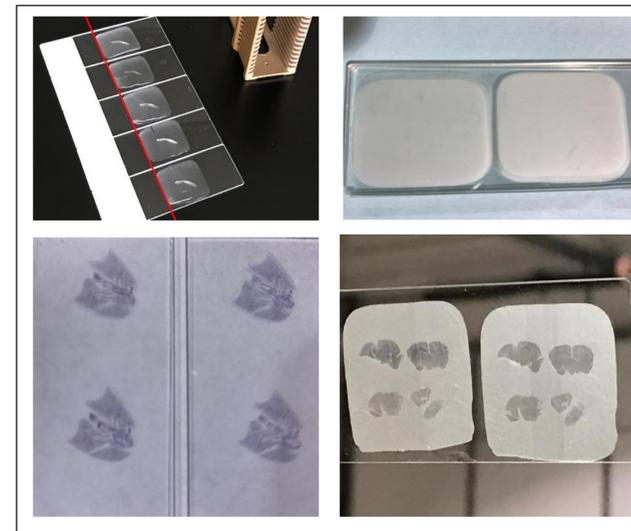
Mouse tissues mounted with Aquaro ASM



Examples of IHC Staining



Consistent placement on slides



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Less Contamination



A coarse filter removes large pieces of wax/tissue; a fine filter (20 um pore size) removes smaller particles. Sections encounter only this doubly filtered water.

Control Paraffin Waste



Paraffin can cause a mess in the lab, and can lead to falls. Aquaro ASM treats discarded sections (i.e. waste created by trimming/facing) much like “good” sections by floating them down the ramp and collecting them on a filter (instead of mounting them) for easy disposal.

Ergonomics

Aquaro ASM eliminates many of the motions that result in repetitive motion injuries including:

- Turning the microtome crank to cut a section
- Transferring sections to the water bath using a paintbrush and forceps
- Mounting the section while floating on the water bath

Conclusions

Aquaro ASM minimizes sectioning and mounting errors, eliminates contamination, and enhances laboratory safety. The device provides hands-free section mounting via user-defined parameters.