



ORAL PRESENTATION

Pathology workflow and the integration of image analysis

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In today's pathology lab, understanding and optimizing the workflow becomes more and more important. The integration of image analysis into the workflow requires special considerations for generating correct results. Currently, image analysis in pathology is used primarily for the quantification of IHC slides like Her2.

Pathology laboratories can choose from a number of image analysis systems which scan complete slides at different magnifications and generate virtual slides for review by pathologists. Pathologists can mark regions of interest on virtual slides for quantification. Specific algorithms can then be applied to each region, generating results/scores that are calculated for these regions. The resulting data is then, together with pre-selected images, compiled into a customizable report.

There are four key components for image analysis:

- Staining quality
- Image quality
- Algorithm
- Region selection

Staining quality can be improved through the use of automated staining with defined staining protocols. Additionally, linking specific pre-treatment, antibody, and staining protocols to an image algorithm is key for consistent results. Having consistent staining is necessary for successful image analysis because differences in staining lead to differences in acquired digital images thereby affecting image analysis. Image quality can be achieved through automation and calibration. Algorithms need to be specific to the antibody used to generate the appropriate results. Region selection relies on the pathologist's expertise. Thus, image analysis is used as an aid to the pathologist.

A key component to image analysis is the integration of the image analysis system into the overall lab workflow. For example, Dako Link is used to connect different

instruments in the IHC laboratory and to capture data from different steps in the slide preparation process, which are stored and can be retrieved. In this workflow, the first step is accessioning, where case information is captured together with the requested staining protocol. The automated staining instrument uses this information (including the antibody and the staining protocol) to stain the slide. The actual information for a specific slide is then stored. Once the slides are stained and ready, they are loaded onto the ACIS[®] III, which accesses the Dako Link database and retrieves information about the slide. The information is then used to select the appropriate algorithm, which will be used to process regions on the slide.

By linking automated staining systems with image analysis systems, the user is not required to re-enter information and therefore the opportunity for errors is lowered, while at the same time it is guaranteed that the correct algorithm is used for the slide.

This concept could be used to connect other image analysis systems to laboratory workflow, improving overall workflow and reducing the number of opportunities for transcription and other errors.

In the future, digital pathology will include digitization of the complete workflow. Information will be generated in the lab, including staining information and digitization of the slide and the process will be completed by image analysis.

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