ID HUMN.06

Artificial Intelligence in Microscope-Based Imaging: Automation of the Buccal Micronucleus Cytome Assay?

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Artificial intelligence (AI) has become a key factor for automated microscope-based image analysis. The power of artificial neural networks in the evaluation of digital image content opens unimagined possibilities for automating even complex assays.

MetaSystems uses Deep Neural Networks (DNN) in its scanning software Metafer to classify objects based on criteria determined by the algorithm. These networks are trained with large amounts of pre-classified image data (supervised learning).

The Buccal Micronucleus Cytome Assay is increasingly used in epidemiological studies to investigate the influences of nutrition, lifestyle, and exposure to genotoxins. The assay looks at many different cell classes and markers, and evaluation of a very large number of cells is required for a significant result. Automation of the assay would therefore be highly desirable.

We would like to take advantage of the HUMN workshop to discuss with the participants the different possible approaches for automation of the Buccal Micronucleus Cytome Assay using DNN.

Keywords:
Artificial Intelligence; Buccal Micronucleus Cytome Assay; Automation; DNN.