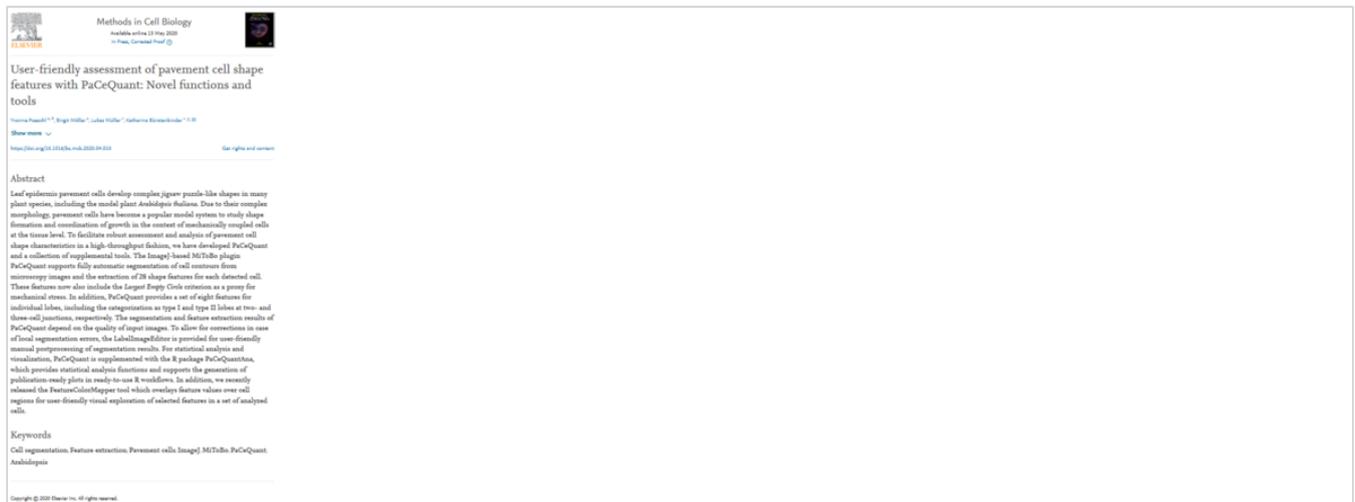


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+++ News Ticker Science #39 +++ Cell Biology



User-friendly assessment of pavement cell shape features with PaCeQuant: Novel functions and tools

Scientists led by Katharina Bürstenbinder (IPB), together with bioinformaticians from the Halle University and the German Centre for Integrative Biodiversity Research iDiv, have optimized their epidermis pavement cell measurement program [PaCeQuant](#) and provided it with further useful tools. PaCeQuant is an ImageJ-based [MiToBo](#) plug-in that automatically records specific parameters of several hundred epidermal cells simultaneously. The program is therefore ideally suited for a solid analysis of epidermal cells in a high-throughput process. PaCeQuant supports fully automatic segmentation of cell contours from microscopy images and the extraction of 28 shape features for each detected cell. These features now also include the Largest Empty Circle criterion as a proxy for mechanical stress.

In addition, PaCeQuant provides a set of eight features for individual lobes, including the categorization of lobes at two- and three-cell junctions. To allow for corrections in case of local segmentation errors, the LabelImageEditor is provided for user-friendly manual postprocessing of segmentation results. For statistical analysis and visualization, PaCeQuant is supplemented with the R package PaCeQuantAna, which provides statistical analysis functions and supports the generation of publication-ready plots in ready-to-use R workflows. With the new FeatureColorMapper tool it is possible to overlay feature values over cell regions for user-friendly visual exploration of selected features in a set of analyzed cells.

Due to their complex morphology, leaf epidermis pavement cells have become a popular model system to study shape formation and coordination of growth in the context of mechanically coupled cells at the tissue level. The PaCeQuant program developed by the Halle scientists will be a great help in this respect. The results were recently published in *Methods in Cell Biology*.

Publication:

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