DEFINIENS®
the tissue phenomics company

Power of Tissue Phenomics®: Morphological Features Associated with Survival

Morphological data can only be quantitatively assessed with automated image analysis technologies. Interpreting the data and correlating it with patient information often requires advanced data processing and mining tools. Using Definiens technology to capture and mine morphological data, researchers are making discoveries that may predict survival times in many patient populations.

Study Synopsis

- Researchers used Definiens technology (automated image analysis and data mining) to identify morphological features of breast cancer that are associated with survival in a large retrospective cohort (n=400).
- Using automated detection, H&E stained tissue was differentiated into tumor and stroma regions. These regions were analyzed with regards to morphological characteristics and the distribution of these features.
- Data mining and machine learning was used to identify a set of morphological features from the quantitative data that predicted survival times.
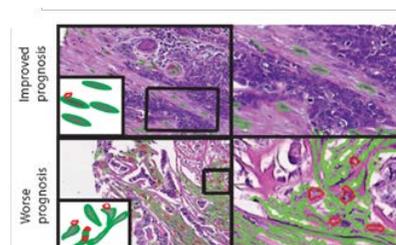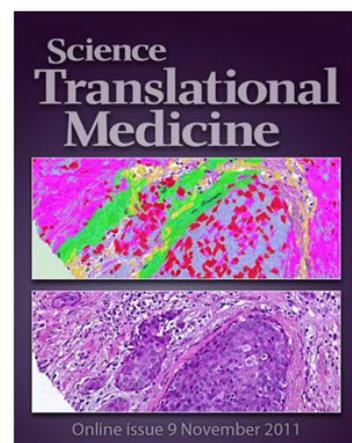
Benefits

- Discovery of meaningful morphological features: The data generated with Definiens technology enables quantification of all tissue features in context and then combine this information with other data types to mine the data for patterns and predictive signatures.
- Fast track from translational to diagnostic tests: this approach can be applied to develop morphology-based diagnostic tests for many different cancer types using readily-available H&E stained tissue and retrospective survival data.

Implications

- With the possibility to measure different tissue features, Definiens enables a big data approach for mining tissue data for novel and meaningful signatures.
- This work demonstrates that the detection of tumor regions can be automated on H&E stained tissue and comprehensive morphological profiles can be obtained enabling a diagnostic test development.

Science Translational Medicine

Online issue 9 November 2011

Examples of the automated morphological segmentation of the tissue samples. Cell organization in the stroma differs between patients with good and poor prognosis.

Additional Information

This work was published in Science Translational Medicine and featured on the journal cover. Images courtesy of Andrew Beck, Ph.D., Harvard Medical School.