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Use of quantitative immunohistochemistry to evaluate marker expression in breast cancer

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Breast cancer is a heterogenous disease and there is a great need for further individualized treatment. Due to extensiv intertumor and intratumor heterogeneity, immunohistochemistry provides valuable spatially resolved marker analysis at the tissue level. Pathologists typically evaluate protein marker expression visually in formalin- xed para n-embedded tumor sections by chromogenic immunohistochemistry. However, pathologist scoring of chromogen staining intensity is subjective and provides only reduced data that is discrete, either ordinal (e.g. 1, 2, 3) or nominal (negative/positive). In contrast, emerging digital pathology platforms allow quanti cation of chromogen or uorescence signals by computer-assisted image analysis, providing continuous signal intensity values. Fluorescence-based immunohistochemistry (IF-IHC) provides greater dynamic signal range than chromogen-immunohistochemistry. Combined with image analysis so ware, uorescence-based immunohistochemistry holds potential for enhanced sensitivity and greater analytic resolution resulting in more robust quanti cation. However, commercial uorescence scanners and image analysis so ware di er in features and capabilities. Vendors' claims of objective quantitative immunohistochemistry are di cult to validate since pathologist scoring is subjective and, importantly, there is no accepted gold standard to measure against. We will present validation studies and progres with quantitative immunohistochemistry on large cohorts of breast cancer using di erent technologies. e path towards implementation of objective tumor marker quanti cation in pathology laboratories will be discussed.

Biography

Hallgeir Rui is a PhD holder and serves as the WBCS Endowed Professor of Breast Cancer Research in the Department of Pathology at the Medical College of Wisconsin, Milwaukee, WI. He has previously held positions at Thomas Jefferson University, Philadelphia, PA, Georgetown University, Washington DC, and 8QLIRUPHG 6HUYLFHV 8QLYHUVLW\ %HWKHVGD 0' +H FRPSOHWHG KLV 3RVW GRFWRUDO WUDLQLQJ DW his MD and PhD degrees at the University of Oslo, Norway. His laboratory research is centered on analyses of human breast cancer to improve tailored therapy.

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