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Cascade Reaction in Human Live Tissue Allows Clinically Applicable Diagnosis of Breast Cancer Morphology

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Abstract

© 2018 The Authors. Published by WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim Clean operating margins in breast cancer surgery are important for preventing recurrence. However, the current methods for determining margins such as intraoperative frozen section analysis or imprint cytology are not satisfactory since they are time-consuming and cause a burden on the patient and on hospitals with a limited accuracy. A “click-to-sense” probe is developed based on the detection of acrolein, which is a substance released by oxidatively stressed cancer cells and can be visualized under fluorescence microscopy. Using live breast tissues resected from breast cancer patients, it is demonstrated that this method can quickly, selectively, and sensitively differentiate cancer lesion from normal breast gland or benign proliferative lesions. Since acrolein is accumulated in all types of cancers, this method could be used to quickly assess the surgical margins in other types of cancer.

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Keywords

acrolein, breast cancer, breast-conserving surgery, imaging, TAMRA phenyl azide

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