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TITTA KIVIKOSKI: Significance of HSD17B1 in breast and ovarian cancer – validation of novel HSD17B1 antibodies

Master Thesis, 83 p.

Drug Discovery and Development

August, 2017

The authenticity of this publication has been reviewed by Turnitin Originality Check – program

Hydroxysteroid (17beta) dehydrogenases (HSD17Bs) are an essential group of enzymes responsible for steroid hormone metabolism. HSD17Bs catalyse the reduction of 17-ketosteroids or the oxidation of 17beta-hydroxysteroids. One of the isoforms, hydroxysteroid (17beta) dehydrogenase type 1 (HSD17B1), is crucial for the conversion of less active estrogen, estrone (E1) to the biologically most potent estrogen, estradiol (E2). Therefore, manipulation of E2 levels by HSD17B1 inhibition potentially controls the development of estrogen responsive diseases such as breast cancer, endometriosis, and ovarian cancer.

HSD17B1 antibodies would be valuable tools for research. In this work, a part of validation work of novel HSD17B1 antibody clones, #39-5-2 and #9-12-3, was carried out. In immunohistochemical (IHC) analysis performed with the antibodies, placenta and ovarian cancer showed strong positivity as expected, whereas breast cancer showed positivity only when stained with the antibody clone #9-12-3. In addition and against the expectations based on previous literature, staining was not exclusively cytoplasmic but also nuclear. HSD17B1 expression was next investigated in breast and ovarian cancer with IHC. Cancer tissue microarrays were stained with the clone #9-12-3, and both cancer types showed remarkable HSD17B1 staining.

Specific HSD17B1 antibodies are important tools to obtain useful information about the HSD17B1 expression in diseases and allow recognition of putative novel indications for HSD17B1 inhibition. Data of the present study suggests that HSD17B1 may have an important role not only in breast cancer, in which a significance of estrogen action is indisputable, but also in ovarian cancer. Further, HSD17B1 may have prognostic value in breast cancer, and thus, HSD17B1 antibodies could have a role in diagnostics as well.

Keywords: Hydroxysteroid (17beta) dehydrogenase type 1, HSD17B1, breast cancer, ovarian cancer