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DISSERTATION TITLE:	*Study of the role of CTCF and FOXA1 in breast cancer*

Breast cancer is a disease characterized by aberrant growth of the mammary epithelial cells. Its outcome can be affected by specific genetic components and by the activity of proteins influencing cell proliferation and death. In her PhD work, Elisa Fiorito aimed to understand the role of a specific genetic variant and of the transcription factors CTCF and FOXA1 in breast cancer.

Breast cancer is the most common female malignancy in the world, representing the first cause of cancer death among women. In particular, this disease is characterized by uncontrolled proliferation and migration of mammary epithelial cells. Clinical studies have shown that 70% of breast cancer cases express Estrogen Receptor α (ER), which is the main driver of cell proliferation. Upon the interaction with its ligand estrogen, ER binds the chromatin in the nucleus, where it activates a specific transcriptional program resulting in cell proliferation. Decades of research have improved our knowledge of ER functions and prompted the development of inhibitors commonly used in breast cancer therapy. Moreover, recent studies have characterized a new class of transcription factors, named ER cooperating factors, which tightly modulate ER mediated transcription. Alterations in the functions of these factors and of their chromatin interactions can affect ER activity and breast cancer outcome.

Elisa Fiorito's PhD work aimed at elucidating the functions of ER cooperating factors in breast cancer cells. By employing genomic methods, this study shed light on the molecular mechanism through which a common genetic variant influences ER-positive breast cancer risk. Moreover, Elisa Fiorito's work showed that the transcription factor CTCF can repress a subset of genes related to breast cancer poor prognosis by influencing the formation of long-range chromatin interactions. In addition, in her PhD activity, Elisa Fiorito contributed to the study of FOXA1 role in the activation of genes promoting breast cancer aggressiveness and estrogen-independent cell growth.

All in all, these findings highlight the importance of cooperating transcription factors and open clinical perspectives on the prediction of breast cancer outcome. Moreover, the development of drugs able to modulate the functions of these factors might be crucial to overcome anti-estrogen resistance and prevent breast cancer progression.