

## **Evaluation of HER2 oncogene in breast cancer through the Silver In Situ Hybridization (SISH) technique.**

**Introduction:** Breast cancer is a heterogeneous disease characterized by one to twenty separate histological subtypes and at least four different molecular subtypes, each with distinct presentations, response to treatment and clinical outcomes. Accumulation of genetic or epigenetic mutations by various factors and the disruption of this balance leads to the development of breast tumor. Enhancement of the HER2 proto-oncogene and its protein overexpression is seen in 20-40% of breast cancer patients and plays a key role in biological behavior. Immunohistochemistry is the most commonly used, simpler and cost effective initial screening for HER2 protein expression. The American Drug Agency (FDA) recommends HER2 immunohistochemical effects with 0+ and 1+ score to be considered HER2 negative, and HER2 (3+) individuals should be considered as HER2 positive whereas HER2 ambiguous invasive breast cancer is he scored HER2 (2+). That is something that needs to be further evaluated by the fluorescence hybridization technique (FISH), which as a process is more accurate and more reliable than immunohistochemistry. However, its disadvantages are the need for a skilled operator, the long process, the special equipment and the non-maintenance of the samples for later review. A fully automated method, Silver In Situ Hybridization (SISH) can overcome the disadvantages of FISH and have the same precision as the FISH technique.

**Purpose:** Confirmation of the ambiguous HER2 immunohistochemical oncogene with a 2+ score as a predictor marker with the SISH molecular technique.

**Materials and Methods:** 150 cases of invasive breast cancer will be studied and the exact expression of the HER2 oncogene in those of the immunohistochemistry scores is 2+ by the SISH technique.

**Expected results:** There are indications for confirmation of the ambiguous HER2 immunohistochemical oncogene with a 2+ score as a predictive marker with the SISH molecular technique.

**Conclusions:** This study will attempt to evaluate HER2 oncogene in breast cancer by the SISH technique when it is ambiguous with 2+ immunohistochemically