

# CHAPTER 1: INTRODUCTION

## 1.1 BREAST CANCER

Breast cancer is a cancer that begins in the breast tissue, most commonly in the milk ducts, or the lobules of the breast. Most breast cancers are carcinomas, which is cancer that begins in epithelial cells in organs and tissues. Breast cancer can also be sarcomas, which begin in cells of fat, muscle, and connective tissue [1,2]. Most invasive breast cancers start out as Ductal Carcinoma in Situ (DCIS), often referred to as a precursor to breast cancer. In DCIS the cells lining the ducts are abnormal, but are not yet invasive and have not spread outside the milk duct. DCIS can become Invasive Ductal Carcinoma (IDC), the most common type of breast cancer. Breast cancer can also begin in the milk-producing lobules of the breast. Lobular breast cancer begins as Lobular Carcinoma in Situ (LCIS), and can become Invasive Lobular Carcinoma (ILC) [3]. Other, more rare types of breast cancer include inflammatory breast cancer, paget disease of the nipple, Phyllodes tumor, and angiosarcoma that together encompass 1-3% of all breast cancer diagnoses. Both IDC and ILC, and other breast cancers such as inflammatory breast cancer, can progress into metastatic breast cancer, where cancer cells spread beyond the breast into surrounding lymph nodes and distinct tissues [4].

Treatment for patients with breast cancer is individualized depending on the immunohistochemistry of the patient's breast cancer, as well as the stage of breast cancer. When a patient is diagnosed with breast cancer, their cancer is tested for three receptors: estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor