Lynch syndrome is a hereditary cancer disorder that can lead to the development of many types of cancers including colorectal and endometrial cancers [1]. Lynch syndrome is caused by a mutation in the DNA mismatch repair pathway which leads to an accumulation of mutations that can contribute to the development of cancer [2]. Mutations in the mismatch repair protein MSH6 account for 10% of cases of Lynch syndrome [3]. MSH6 has a role in the recognition of mismatched base pairs [4]. It is currently debated whether MSH6 mutation leads to a higher risk of breast cancer potentially through an interaction with BRCA1.

My **primary goal** is to determine if MSH6 is associated with a higher risk of breast cancer and whether it interacts with BRCA1 or other variants associate with breast cancer. I will use yeast (*Saccharomyces cerevisiae*) as a model organism as DNA repair pathways are well conserved between yeast and humans [5]. My **hypothesis** is that MSH6 does play a role in breast cancer development. My **long-term goal** is to discover If PD-1 blockade may be an effective treatment for breast cancer associated with mismatch-repair deficiency.

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