



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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| <b>Name(s)</b><br><br><b>Maya Khurana</b>   | <b>Project Number</b><br><br><b>S1213</b> |
| <b>Project Title</b><br><br><b>Occult Breast Cancer: Does Molecular Profile Matter in Treatment?</b>  |   |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b><br/>In this study, I aimed to describe the hormonal profile of occult breast cancers and also to evaluate the relationship between progesterone receptor and grade of the occult breast cancer. Additionally, I compared occult breast cancer patients with typical breast cancer patients in order to understand the molecular subtypes of occult breast cancer in relation to breast cancer and to improve treatment options for both groups. To my knowledge, the prevalence of progesterone receptor expression in occult breast cancer has not been investigated. In addition, the relationship of progesterone receptor and the cancer grade has not been studied in occult breast cancer. I hypothesized that patients with lower PR prevalence would have a higher grade, and that occult breast cancer patients, overall, would have adverse prognostic features compared to breast cancer patients.</p> <p><b>Methods</b><br/>I conducted a review of both typical breast cancer and occult breast cancer cases from Kaiser Permanente Los Angeles Medical Center spanning the years 2008-2018. The search was conducted through the use of ICD-9 codes. The obtained data were then delinked from all patient medical identifiers such as medical record numbers, name of the patient and surgical pathology case numbers. New lists of cases were then created, and each case was assigned a number: BC 1-28 and OBC1 - OBC31. Using the patient data that we had acquired, I compared trends in breast cancer patients to trends in occult breast cancer patients; I then arranged the information into various graphs and tables (see figures below) in order to study the correlation between isolated variables such as the PR percentage and the grade. This study is IRB approved.</p> <p><b>Results</b><br/>This molecular profile comparison revealed that between breast cancer and occult breast cancer patients, there were 16 Luminal A breast cancer patients compared to 5 Luminal A occult breast cancer patients. Because Luminal A patients tend to have better prognoses, the lower frequency of Luminal A in occult breast cancer patients indicates an adverse prognosis. Additionally, including Luminal B patients, there were 19 HER2 positive occult breast cancer patients compared to the 9 HER2 positive breast cancer patients in the study. There were over two times as many occult breast cancer patients with the more aggressive profile of HER2 than there were breast cancer patients. And, 4 triple negative occult breast cancer patients compared to the 3 triple negative breast cancer patients. Furthermore, of the 31 occult breast cancer patients studied, 8 of them, or 25.8%, died over a 10 year period, from 2008 to present. No breast cancer patients</p> |   |
| <b>Summary Statement</b><br><br>This project aimed to determine how the molecular profiles of occult breast cancer affect patients' prognoses and potential treatments.   |   |
| <b>Help Received</b><br><br>I was mentored by Dr. Victoria O'Connor, a surgical oncologist at Kaiser Permanente in Los Angeles.   |   |