Award ID:
RP160795

Project Title:
A "Pap smear" for ovarian cancer

Award Mechanism:
High Impact/High Risk

Principal Investigator:
Yen, Laising

Entity:
Baylor College of Medicine

Lay Summary:

Ovarian cancer is the most lethal gynecologic malignancy, and women with ovarian cancer continue to have an unacceptable 5-year survival rate of only 31%. This low survival rate has barely changed during the last three decades, indicating that we have not yet made the major advances necessary to win the "War on Ovarian Cancer". The major reason for the low rates of survival is that most patients are diagnosed at an advanced stage, because there is no useful screening test for ovarian cancer. None! Detecting the cancer early enough to be surgically treatable would greatly reduce mortality. Our proposal is designed with this in mind. We aim to leverage the existing cervical Pap smear screening strategy and combine it with the specificity of cancer fusion genes to create a "Pap smear" test for ovarian cancer.A fusion gene is a mutation containing portions of two different genes, and is very useful for cancer diagnosis. By using modern genomic methods, we identified a list of ovarian cancer–specific fusion genes. Finding the cancer-specific fusion genes in Pap smears that are also found in primary tumors would indicate the presence of a malignancy in patients. Our approach offers several unique advantages. First, Pap smear is well-established, routinely carried out in clinics, and tolerable for women. Second, because the fusion gene is cancer-specific, sensitive molecular tests can yield a clear "yes or no" result. This eliminates the ambiguity in cut-off levels associated with over-expressed biomarkers, such as CA-125, that are not cancer-specific. These advances are critical, given that ovarian cancer kills 140,200 women worldwide each year, and no method is available for routine detection. Our team includes an expert with ovarian cancer fusion genes (Dr. Yen), experience in Pap smear analyses (Dr. Michael Scheurer), and in Gynecologic Oncology (Drs. Benedict Benigno and John McDonald) to establish an effective collaboration for addressing an urgent medical need.