

Summer Research Fellowship Proposal for 2020

FACULTY INFORMATION:

NAME: Joseph Su, PhD, MPH

DEPARTMENT: Epidemiology – College of Public Health

LOCATION: Rahn 6201E

PROJECT INFORMATION:

TITLE: Genetic variability in DHFR and folic acid supplementation as novel risk factors for aggressive prostate cancer

LOCATION OF THE PROJECT: Cancer Institute 11-174

BRIEF DESCRIPTION OF THE PROJECT: Folate and its synthetic form, folic acid, is a water-soluble B vitamin which is involved in DNA synthesis and repair, and in regulation of gene expression through DNA methylation as a methyl donor. Despite of confirmed beneficial effect of folate/folic acid supplementation on the prevention of neural tube defect, concerns have been raised recently that folic acid food fortification and high prevalence of folic acid intake with multivitamins and supplements may lead to excessively high intakes, which may promote carcinogenesis or cancer progression. Circulating unmetabolized folic acid (cUMFA) is a by-product of high intake of folic acid, and has been associated with reduction of cytotoxicity of natural killer cells, which may be a mechanism by which high levels of folic acid promote carcinogenesis. Study has shown that participants with dihydrofolate reductase (*DHFR*) 19bpdel/del were at increased risk of having elevated levels of cUMFA, particularly when daily folic acid intake exceeded 500 micrograms. African Americans (AAs) are diagnosed with aggressive prostate cancer more often and have more than twice the prostate cancer mortality rates as European Americans (EAs). Studies have demonstrated that *DHFR* 19bpdel/del frequency is more prevalent among AAs than EAs, which may partially explain the elevated prostate cancer rates among AAs. Therefore, the hypothesis of this application is that excess folic acid intake, as measured by both diet/supplement intake and plasma cUMFA, will be associated with increased odds of high aggressive prostate cancer, and that this effect will be modified by the *DHFR* polymorphism.

STUDENT'S RESPONSIBILITIES-DUTIES IN THE PROPOSED PROJECT: Student will assist in basic laboratory work, genetic polymorphism analysis, and statistical analysis

ESTIMATED TIME FOR PROJECT COMPLETION: 8-12 weeks

DOES THE WORK INVOLVE ANIMAL RESEARCH? YES
NO