Award ID:
RP130090

Project Title:
Personalized risk assessment for families with Li-Fraumeni Syndrome

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

The Li-Fraumeni syndrome (LFS) involves an inherited mutation in the p53 tumor suppressor gene, which allows different types of tumors to develop relatively early in life. This syndrome can be confused with others, especially the hereditary breast and ovarian cancer syndrome, making it difficult to counsel in high-risk clinics. Our objective is to improve the identification and screening of families with early-onset cancer at multiple sites by providing physicians and genetic counselors with tools to comprehensively assess both an individual's chance of carrying the p53 mutation before he/she is tested, and the risk projection that an individual with this mutation will develop specific forms of cancer. Our rationale is that the model we develop will lead to more effective genetic counseling and screening. Our significant contribution will be an easy-to-use computer application that will enhance genetic counseling by improving the detection of p53 mutations in families with early-onset breast cancer and other cancer types, and providing cancer risk projection for individuals with p53 mutations. Our computer application, LFSpro, will be the first mathematical model for assessing the risk of the hereditary p53 mutations associated with LFS. It will help families when deciding whether to undergo the LFS surveillance protocol that has been shown to reduce LFS-related deaths. The model will include different risk effects for different types of early-onset cancer based on the p53 mutations and other variables. Consequently, the model will more accurately predict who is at risk. We will integrate LFSpro into the existing BayesMendel and CancerGene software packages, which are already in wide use for risk assessment and counseling at high-risk clinics, in particular breast clinics. This project takes advantage of data from hundreds of families provided by multiple clinics and made available through the LFS consortium.