

The military provider-‘ome. Preparing the air force medical service for ‘omic-informed, personalized medicine

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The evaluation of the clinical utility of systems biology data for personalized medicine will require an evaluative framework that can handle multiple ‘omics technologies, alongside all available patient data, family history, and lifestyle information. Of the ‘omic technologies, genomic information is the most imminent, with direct-to-consumer sources offering cheap genotyping, and soon cheap whole genome sequencing. We are implementing the US Air Force Patient-Centered Precision Care Program, or PC2-Z to begin to lay the foundation for genomic, and later other ‘omic implementation in the military. The PC2-Z Program's overarching goal is to gather clinical knowledge and experience translating genome-informed medicine into personalized healthcare for DoD personnel and beneficiaries. Thrust areas include informatics, education, research, and policy. The center piece of PC2-Z is a 10-year prospective clinical utility study of a community cohort of Air Force Medical Service (AFMS) volunteers and support staff, which is evaluating the utility and effect of their genomic information on their personalized care and on their behavior. Genomic information is collected alongside family history, lifestyle choices, environmental, and all available medical data, and so risk is reported using all available risk factors collected for only actionable and preventable conditions, as well as selected pharmacogenomic drug/gene variant pairs. The involvement of AFMS volunteers is a pedagogical educational approach and provides them with initial experience in genome-informed clinical care. The infrastructure built in this program will be scalable, eventually utilizing and reporting other systems biology data such as proteomics and metabolomics. The data, evidence, and infrastructure developed in the PC2-Z program is also planned to be implemented by the sister services.

Biography

Christopher Bradburne has BS degrees in Biology and Biochemistry, an MS in Biochemistry, and a Ph.D. in Functional Genomics. Until 2010, he was a National Research Council post-doc at the Naval Research Laboratory. He is the Research Lead for the USAF PC2-Z Personalized Medicine Program, which is sponsored by the USAF Surgeon General's Office of Innovation, and also leads the APL Biosecurity Sequencing and Informatics Center. He has published more than 40 papers in peer-reviewed journals, and currently leads research projects in wide-ranging topics from Biodefense to Astrobiology.

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