

BUDGET JUSTIFICATION – Washington University

Senior Personnel:

Li Ding, Ph.D. (PD/PI; 1.80 calendar, 15% effort):

Dr. Ding is an Associate Professor of Medicine and Genetics at Washington University School of Medicine, Director of Computational Biology in Oncology, and Assistant Director of The McDonnell Genome Institute. She has a unique combination of in-depth understanding of software development, integrated data analysis, and biological science. Her research team has developed a collection of computational tools, including VarScan, SomaticSniper, SciClone, BreakDancer, BreakFusion, MSIsensor, Pindel-C, GenomeVIP, HotSpot3D, PathScan, and MuSiC, all widely used by the research community for analyzing high-throughput sequencing data. In particular, her team established a robust analysis pipeline that has been used for 1000 Genomes Project (including 1000G SV project), the Cancer Genome Atlas (TCGA) project, Clinical Proteomic Tumor Analysis Consortium (CPTAC), and other medical genomics projects. Dr. Ding plays significant roles in TCGA and ICGC, co-chairing TCGA PanCanAtlas Oncogenic Process group, Sarcoma AWG, and ICGC mutation calling group (PCAWG-1). Dr. Ding also serves on the Steering Committee for NCI Genomic Data Commons (GDC). Dr. Ding has successfully led many large-scale, multi-institute studies on the genomics of lung adenocarcinomas, AML, and breast cancer. Building on this foundation, her lab has produced a series of seminal publications in the fields of cancer genomics research and cancer biology, including 1) the discovery of 127 cancer genes across over 3,000 tumors from 12 major cancer types; 2) the report of 13 significant germline susceptibility genes in over 4,000 cancer cases; 2) the identification of pre-existing mutations in 19 leukemia and/or lymphoma-associated genes in people without overt hematological malignancies; and 4) the development of advanced computational tools for detecting druggable complex indels often missed by the existing approaches in cancer patients; and 5) the discovery of druggable targets validated experimentally using modern global proteomics approaches. Dr. Ding will be responsible for providing leadership on computational tool and pipeline development as well as association studies for this application.

Michael Wendl, Ph.D. (Co-Investigator; 1.20 calendar, 10% effort):

Dr. Michael Wendl is a mathematical biologist whose expertise is in statistical data analysis, statistical genomics and pathway/network analysis, project design and optimization, databases, and algorithms. Dr. Wendl will work with Dr. Ding to direct the development of association pipeline and association analysis in Aim 3.

Other Personnel:

Adam Scott, Ph.D. (Analyst; 9.60 calendar, 80% effort):

Dr. Adam Scott is a computational scientist and physicist whose expertise is in clustering and data modeling. Dr. Scott will be responsible for developing burden analysis approaches by integrating impact scores.

Matthew Wyczalkowski, Ph.D. (Research Associate; 2.40 calendar, 20% effort):

Dr. Wyczalkowski is a computational scientist whose expertise is in software development and data analysis. Dr. Wyczalkowski will be responsible for association analysis.

Travel: (\$9,000)

We are requesting funding of \$3,000 per year for 2 project members to participate in annual scientific conferences and meetings.

Consumable Supplies:

Computer Supplies: (\$18,000)

We are requesting fund of \$6000 per year for purchasing 1 laptop and 1 workstation.

Other Expenses:

Computing: (\$30,391)

We are requesting \$12,985 in year 1, \$10,000 in year 2, and \$7,406 in year 3 for cloud computing and cloud pipeline development.

Publication: (\$9,311)

We plan to publish 2 papers a year with the cost of \$3000 in year 1, \$3,311 in year 2, and \$3,000 in year 3.