

University of Idaho Budget Justification

Senior Personnel

The University of Idaho has determined the salary year for senior personnel to be based on the calendar year.

Paul Rowley, Principal Investigator, 1 calendar month

Dr. Rowley is the contact PI for the project. Dr. Rowley's primary responsibility will be to advise and guide the empirical approach detailed in objective 2 of the proposal. This will involve mentoring staff in techniques that are relevant to human tissue culture, mammalian virology, molecular cloning, and protein expression. Dr. Rowley will also be responsible for training staff and students in safe laboratory practices and techniques pertinent to biological safety level 2. Dr. Rowley will be responsible for the writing of manuscripts and the communication of data to stakeholders. Requested amount is \$8,131.

Jagdish Patel, Co-Principal Investigator, 3.5 calendar months

Dr. Patel will be responsible for implementing molecular modeling studies as described in objective 1, prioritizing laboratory work with experimentalists, and coordinating bioinformatics pipelines with help from undergraduate research students. Dr. Patel will also take the lead on the data management aspects of this study, which includes compiling experimental data, refining molecular modeling protocols, performing simulations, data analysis, and preparing manuscripts for publication. He will also be responsible for reporting the study's findings. Requested amount is \$24,649.

James VanLeuven, Co-Principal Investigator, 1 calendar month

Dr. Van Leuven will be primarily responsible for compiling ACE2 sequences from diverse animal species from public databases, perform and clean sequence alignments from unassembled genomic datasets, and calculate measures of diversity and selection across ACE2. Dr. Van Leuven will be assisted in these computation tasks by undergraduate students who he will train in these techniques. Dr. Van Leuven will also assist in the dissemination of results through publication and outreach activities.. Requested amount for is \$6,937.

Other Personnel

Angela Crabtree, Research Technician, 4.5 calendar months

Ms. Crabtree will be primarily responsible for the creation and handling of SARS-CoV2 spike protein pseudotyped lentivirus particles created in tissue culture. Ms. Crabtree has been extensively trained in the creation of pseudoviruses with ebolavirus or vesicular stomatitis virus glycoproteins. She will also be responsible for design and molecular cloning of animal ACE2 receptors by Gateway™ cloning. With the PIs, Ms. Crabtree will also mentor Mr. Fredericks, who is a more junior member of the research team, in techniques pertinent to the culture of human cells and the expression of ACE2 in human cell lines. Ms. Crabtree, as the laboratory manager, will also be primarily responsible for the administration of the project to ensure that all health and safety protocols are being followed to maintain biosafety and containment as well as ordering supplies and maintaining equipment. Requested amount for is \$13,322.

Lance Fredericks, Research Technician, 6 calendar months

Mr. Fredericks will be spearheading the ectopic expression of ACE2 in human cell lines and

the validation of their expression using immunostaining/flow cytometry and Western blotting. Mr. Fredericks will also use pseudoviruses created by Ms. Crabtree to infect transfected cell lines to measure cell susceptibility to SARS-CoV2 spike protein pseudotyped virus. As Mr. Fredericks is the most junior member of the research team, he will be expected to shadow Ms. Crabtree to receive additional training on pseudovirus construction and molecular cloning techniques, respectively. Requested amount for is \$16,817.

Two Undergraduate Students, 9 calendar months

The project will be supported on by two undergraduate research students that will be involved across all levels of the project from computational approaches to empirical virology. The requested funds include 10 hours per week during the fall/spring semester. Both students will be responsible for performing data manipulation and curation of ACE2 receptor sequences from animals under the supervision of Dr. Van Leuven. Students will also be trained in basic computational pipelines of molecular modeling simulations under the supervision of Dr. Patel. Towards the end of the project students will also be given the opportunity to assay SARS-CoV2 cell entry via animal ACE2 receptors and gain experience in mammalian tissue culture techniques. Requested amount \$9,000.

Fringe Benefits

Fringe benefit rates according to University of Idaho guidelines is 30.7% for faculty, 41.8% for staff, and 2.1% for students. Total fringe benefits for this project is estimated to be \$24,980.

Other Direct Costs

Materials and Supplies:

- Requesting \$14,482 for reagents.
 - The requested budget is requested for consumable materials associated with human tissue culture experiments with pseudotyped viruses. The expenses were calculated based on comparable experiments and associated costs for a similar project initiated for studying ebolavirus cell entry inhibitors (~\$10,000 per year). Additional funds are requested for Gateway™ cloning reagents and reagents and cells for molecular cloning of ACE2 (competent cells, PCR reagents, bacterial cell transformation and culture).
- Requesting \$15,000 for gene synthesis.
 - The DNAs received will encode ACE2 from 50 diverse animal species verified for sequence accuracy. Clones will come in a format that is amenable for direct Gateway™ cloning into a mammalian protein expression vector.

Facilities fees

- Requesting \$2,000 for one standard IBEST Computational Resources Core account.
 - The IBEST Computational Resources Core provides access to state-of-the-art high-performance computing facilities and very large data storage capacity for use in analyzing and managing large volumes of research data. Our simulation jobs will use hundreds of processors in parallel or hundred-Gigabyte memory allocations and may require weeks to complete.

Indirect Costs

Calculated at the University of Idaho Federally Negotiated Indirect Cost Rate as Modified Total Direct Cost excluding participant support costs, equipment > \$5,000, tuition, and those amounts of sub awards in excess of \$25,000. 47.50% rate applied. Total F&A for this project is estimated to be \$64,276.