**Senior Personnel**

CoPI MacManes is responsible for the genetic and bioinformatic components of this proposal. Specifically, he will oversee the design and execution of the genetic component AIM1 and AIM2, which involves extraction of RNA from tissue samples, generation of mRNA sequencing libraries, sequencing on the Illumina HiSeq 2500 platform, and all bioinformatic analysis. MacManes will train graduate students, and will interact with other project participants (undergraduate students). Two months of summer salary per year is requested for all three years of the project, during which 100% effort will be committed to this project. Salary is increased annually by 3% to account for inflation.

**Other Personnel**

3 years of summer salary ($7,000, increased by 3% annually) and 1 year of academic year salary and tuition ($17,595 and $5,338 respectively) are requested for a graduate student. The graduate student will conduct animal experiments, make sequencing libraries and perform bioinformatic analyses. The graduate student will be encouraged to travel to summertime scientific meetings, and will participate in other activities, which include interacting with the public and the mentoring of underrepresented groups. Manuscripts related to the genetic component will be co-authored by the graduate student.

Funding is also requested for one undergraduate student per summer. This student, who will participate in research activities year-round, will be paid $4,500 for full-time summer work, and will receive University credit during the academic year.

**Travel**

$2,000 per year in years 2 and 3 is requested to cover travel to scientific conferences for the PI and graduate student. Both personnel will present findings related to this research.

**Publication Charges**

$1800 per year in years 2 and 3 is requested to cover fees relating to the publication of research results in peer-reviewed journals.

**Materials and Supplies**

Funds are being requested for RNA/DNA extraction and Illumina sequencing library generation for approximately 240 samples (120 RNAseq, 120 Bisulfite seq - $15,000, split over first 2 years). Funds are requested sequencing these libraries to a depth of approximately 30M 100nt paired-end sequencing reads each. Sequencing will be done at the UNH Hubbard Center for Genome Studies, a core facility of which PI MacManes is an affiliate. Based on current machine throughput, this is approximately 40 lanes of sequence data. The cost of sequencing will be: year 1 ($35,000), year 2 ($34,000), and year 3 ($20,000). $4000 is being requested for the purchase of five enterprise-grade 6TB hard drives and hard drive enclosure, which will serve as a secure storage backup of genomic data. $2,000 per year is requested for maintenance of the large Linux workstation, owned by the MacManes lab on which all genetic analyses will be done. Though this computer resource supports other ongoing research in the MacManes lab, the proposed work is expected to occupy a large amount of this computer’s CPU time and storage capacity, which will allow multiple analyses to be done in parallel. The amount of money requested is proportional to it’s usage relative to other projects, and it far less expensive than purchasing a comparable, dedicated system. $10,000 per year is requested for general research supplies. $5,000 per year is requested to cover animal care costs.

**Facilities and Administration**

Facilities and Administration is charged at 47.5% of MTDC based UNH’s federally negotiated rate.

**Fringe Benefits**

Fringe benefits for summer salaries are calculated at 7.7% per UNH’s federally negotiated rates.