Post doctoral positions at
The Pennsylvania State University
Department of Anthropology

Post-doctoral opportunities:
The complex genomic architecture of biological traits and their evolution, with application to craniofacial development and evolution

The Penn State Department of Anthropology involves a widely recognized research program in developmental and evolutionary genetics. We collaborate with local bioinformatics, computational biology, genomics, and neuroscience centers. We are searching for post-doctoral research scientists in three areas. The positions will integrate biological insight and analysis involving existing software and programming of new applications (Linux & MacOS):

1. *Evolutionary simulation and analysis of complex genetic architecture.* This project involves the use of a forward evolutionary simulation package (*ForSim*) that we have developed to simulate the genomic architecture and evolution of complex traits such as neurologic disease and the morphogenesis of craniometric traits. How well can this architecture be inferred by current methods such as whole-genome sequence or marker-based GWAS or family data? Are there better criteria than statistical significance for understanding complex genomic causation? Script writing is essential, C++ programming desirable.

2. *Simulation of quantitative developmental morphogenesis.* We are developing morphometric simulations of the intercellular signaling interaction interactions among tissues in craniofacial development and its evolution. The goal is to generate ‘movies’ of simulated tissue interactions and their resulting overall shape, that can be compared to morphometric data from high-resolution MRI and CT imaging of normal and transgenic mouse models generated in our laboratories. This position involves programming (current modeling is in C++).

3. *Bioinformatics/Genomic data analysis and modeling.* We are doing genomewide mapping on normal craniofacial variation in mouse and baboon models. This project involves the dissection of implicated genome regions by integrating results from different species and other sources of externally derived information such as regulatory networks and genomic sequence conservation. We relate these results to our other work in neurologic and craniofacial dysgenesis (Down syndrome, craniosynostosis). Ability to use genome database and other bioinformatics resources is required.

These integrated research projects have existing NSF and NIH funding. We will be filling 1-year appointments, that can be extended to 2 or more years. Salary will be NIH/NSF post-doctoral levels based on experience, and starting date can be any time. Penn State is committed to affirmative action, equal opportunity and the diversity of its workforce and our group is already an appealing and successful mixture of different but collaborative people of various genders and cultural backgrounds. Contact Ken Weiss (kenweiss@psu.edu) or Joan Richardsmeier (jta10@psu.edu) for information, or to apply submit CV and names of 3 potential persons we could contact as references.

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