

# MOLECULAR SYSTEMATICS OF FISHES OF ORDER CYPRINIFORMES

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## Description:

Order Cypriniformes (minnows, carps, suckers, barbs, loaches) is the most diverse groups of fishes on the planet, with an estimated 3,285 described species. Cypriniforms are found throughout North America, Eurasia and Africa and are almost entirely confined to freshwater habitats. Tulane University is part of an international, collaboration to describe diversity and resolve relationships among major groups of cypriniform fishes in conjunction with the National Science Foundation's Tree of Life Project.

In this project, a student will use techniques of molecular systematics to investigate phylogenetic relationships of species representing families and subfamilies of cypriniform fishes. Study methods will include DNA extraction, PCR amplification and sequencing of select nuclear and mitochondrial genes. The student will also learn how to search databases of DNA sequences of other fish species via the Internet, as well as methods of aligning new DNA sequences against these data. Finally, methods of phylogenetic systematics will be used to analyze the data and produce phylogenetic trees. For additional background on this project, please visit: <http://bio.slu.edu/mayden/cypriniformes/home.html>.

## Objectives:

During the 10-week period, participants will gain experience with:

- Formulating and testing scientific hypotheses;
- Methods of molecular systematics;
- Computer analysis of data, scientific report writing and presentation of results

## Prerequisites:

Completion of sophomore year, GPA of 3.00 or higher, introductory chemistry laboratory, aptitude and motivation for advanced study in fish biology.