**Biodiversity and Systematics of Nemerteans**

Most people are unaware that the vast majority of living organisms on Earth remain undiscovered and unnamed. In the face of current biodiversity crisis biologists are challenged to quickly discover and describe hundreds of thousands of species to establish a baseline, in order to monitor how ecosystems are altered due to climate change and other impacts of human activity. The vast amount of undescribed diversity, vanishing taxonomic expertise, and the slow pace of traditional morphology-based taxonomy necessitates an alternative approach to biodiversity assessments and species descriptions. Application of molecular methods such as DNA-barcoding promises to expedite species discovery and description. Dr. Svetlana Maslakova is an expert on the biology and systematics of nemerteans, a phylum of marine invertebrates with ~ 1300 described species. Nemerteans are important in marine ecosystems as top predators, and some species are economically significant as predators of commercially important species of crustaceans and clams. Nemerteans also have biomedical potential as toxin producers. To learn more about these beautiful and fascinating worms watch these short videos produced by Dr. Maslakova in collaboration with a professional videographer from the Smithsonian Institution: http://bocasarts.weebly.com/nemertean-tools.html

REU interns in the Maslakova lab will have the opportunity to participate in the project ***Describing the nemertean diversity of the NE Pacific***. When people think about undescribed species, they usually imagine remote or tropical regions, with high levels of diversity and few studies. But much of the undescribed diversity is found right under our noses, in parts of the world that are thought to be well studied. For example, while only ~65 intertidal species of nemerteans are reported from the Oregonian Biogeographic Province, members of the Maslakova lab found that the actual local diversity in this group is nearly double, with many undescribed and cryptic species. Cryptic species look alike, but are separately-evolving lineages, which can be differentiated using DNA-sequence data. REU interns working on this project will have the opportunity to participate in intertidal field-work in Southern Oregon, practice documenting the morphology of nemerteans worms for new species descriptions, learn about modern practices in systematics and biodiversity research, and get hands-on experience with universally applicable molecular techniques such as DNA extraction, PCR, gel electrophoresis, and DNA sequence analysis.