

## Prospective USRA Supervisors

### [Gary Anderson](#)

Research interest – There are two components to Dr. Anderson’s research program on the physiology of ancient fishes. In the first we are examining the impact of early rearing environment on how lake sturgeon develop. In the second we are exploring control of energy balance in sharks, skates, and rays.

### [Kevin Campbell](#)

Research interest – please visit Dr. Campbell’s website for information <https://home.cc.umanitoba.ca/~campbelk/>

### [Gail Davoren](#)

Research interest – please visit Dr. Davoren’s website for information <https://davorenlab.wixsite.com/research>

[Jillian Detwiler](#) website: <https://detwilerlab.weebly.com/>

Research interest – My lab investigates interactions between wildlife hosts and helminth parasites. Our main goals are to characterize host and parasite diversity of aquatic and terrestrial snails and their nematode and trematode parasites as well as explore how parasites alter the behavior of their hosts to increase the likelihood of transmission. We perform work in the field and lab, and use a variety of morphometric, genetic, immunological, behavioural and statistical tools to pursue our research questions.

### [Margaret Docker](#)

Research interest – Dr. Docker’s research uses environmental DNA (eDNA) to monitor fish and other aquatic species of conservation and management concern lends itself nicely to participation by undergraduate students during the summer. eDNA research would involve field work (collecting and filtering water samples) and lab work (DNA extraction, qPCR), and be part of a large Canada-wide eDNA project (see <https://www.genomeprairie.ca/news/gen-fish-harnesses->

[Kevin Fraser](#) website: [www.abclab.ca](http://www.abclab.ca)

Research interest – Dr. Fraser leads the Avian Behaviour Conservation Lab. The lab uses new tracking technologies to investigate how migratory birds time and select their routes and how they respond to climate change.

### [Mark Fry](#)

Research interest – Dr. Fry’s research program focuses on understanding neural circuits that regulate numerous aspects of homeostasis, including blood pressure and appetite. The lab uses molecular, biological and electrophysiological techniques to investigate how circulating signals regulate the electrical activity neurons in homeostasis control centres of the mammalian brain.

### [Darren Gillis](#)

Research interest - Dr. Gillis' research focuses on relationships between fishing success, vessel movement, species selection, and information exchange. His lab develops analyses and models that reflect fish harvester's behavior. These can be used to better interpret historical fisheries data and improve estimates of fish abundance.

#### [Ken Jeffries](#)

Research interest – Dr. Jeffries' lab examines the effects of environmental stress on aquatic organisms. We look at how climate change or pollution-related stressors affect gene expression in ectotherms in the lab and in the wild.

#### [Az \(Ashley\) Klymiuk](#)

Research interest – Dr. Klymiuk studies contemporary wetland ecosystems with the aim of better interpreting fossil wetland assemblages. Work in their lab includes both paleomycology (fossil fungi) and characterizing the diversity of endogenous fungi inhabiting the rooting structures of living wetland plants, using culture – and sequencing-based methods.

[Jeff Marcus](#) website: <http://home.cc.umanitoba.ca/~marcus/>

Research interest – Dr. Marcus and his lab study the evolution of butterfly species and the diversification of butterfly colour patterns using molecular tools and techniques. Recent work has employed next generation sequencing to reconstruct complete mitochondrial genome sequences, which have been used to reconstruct evolutionary trees and explore how these organelles evolve in response to high altitude conditions.

[John Markham](#) website: <https://www.researchgate.net/profile/John-Markham-2>

Research interest – Dr. Markham is interested in the species interactions in communities. In particular, he examines how carnivores and forest floor species affect resource distribution and modify plant communities.

#### [Particia Ramey-Balci](#)

Research interest – the Ramey-Balci lab is interested in how physical and biological processes, both natural and anthropogenic, affect marine invertebrate species diversity, community structure, and population dynamics over space and time. Research questions linking pattern with process and addressed by combining quantitative field studies with experiments. Topical areas: benthic ecology, biodiversity, invasive species, environmental change, environmental health/biotic indices

#### [Sylvie Renault](#)

Research interest – research focus is to investigate the physiological and biochemical changes in plants associated with salinity stress and to determine how these changes can alter the plant responses to other stresses (insect herbivory).

#### [Jason Treberg](#)

Research interest – Dr. Treberg's group applies techniques used to study metabolism to better understand how animals respond or tolerate environmental change and challenges from the scale of electron transport to whole organismal adaptation. Opportunities for undergraduate researchers

include i) mechanistic studies of mitochondrial reactive oxygen species metabolism and ii) the influence of temperature on biological energetics.

#### [Byron Van Nest](#)

Research interest – please visit Dr. Van Nest’s website for information <http://vannestlab.com/>

#### [Jane Waterman](#)

Research interest – Dr. Waterman’s research program focuses on the behavior and ecology of African ground Squirrels, particularly factors influencing the evolution of sociality and mating systems. More recently the lab has started to use their long term data base to examine changes in the morphology, population ecology and behaviour with changing environmental conditions.

#### [Dirk Weihrauch](#)

Research interest – investigating mechanisms related to crucial acid base regulatory mechanisms in aquatic invertebrates, including horseshoe crabs, lobster, and highly invasive green crabs and local endangered Northern crayfish. In our integrative approach we look at physiology and gene expression changes on the animals’ physiology and gene expression patterns, but we also characterize newly discovered transporters involved in the transport mechanism of acid-base equivalents in heterologous expression systems.

#### [Steve Whyard](#)

Research interest – Molecular genetics of insect development; Genetic basis of sex differentiation in insects; Insect olfaction; Biotechnologies to control pest insects; Biotechnologies to protect crop plants from pathogens; Gene silencing technologies; Gene editing technologies.

#### [Olivia Wilkins](#)

Research interest – The Wilkins lab studies climate change resilient plants. We use high throughput sequencing technologies to study functional genomic responses to stress in the field conditions.

[Anne Worley](#) website: <https://sci.umanitoba.ca/biological-sciences/profiles/anneworley/>

Research interest- Evolution and ecology of plant reproduction. 1) Pollination biology in the tall grass prairie, with a focus on rewardless Lady’s slipper orchids. 2) Natural selection by diverse pollinators on subalpine herbs (genus *Polemonium*) in the Rocky Mountains