- Faculté des sciences
- www.unine.ch/sciences

Landscape genetics (3BL2263)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en biologie	**Cours: 2 ph**	**controle continu: 1**	2

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante:

Christian Parisod

Objectifs:

This course brings an advanced overview of micro-evolutionary processes shaping variation within species, with a focus on interactions between landscape elements, gene flow and adaptation. It offers a rich toolbox that is central to the evolutionary ecology and the management of natural and agricultural populations.

Contenu:

1. Reminders on the origin of genetic variation and population genetics
1.1. Genome organization and evolution
1.2. Genotyping approaches
1.3. Genetic drift, gene dispersal, selection
1.4. Evaluation of spatial patterns of genetic variability (Fstat, SPAGeDi, STRUCTURE)

2. From population genetics to landscape genetics
2.1. Putting the landscape in population genetics
2.2. Handling of environmental datasets (ArcGIS spatial toolkits)
2.3. Introduction to Approximate Bayesian Computing
2.4. Scale issues: phylogeography vs population genomics (synthesis)

3. Inference of gene flow in real landscapes
3.1. Landscape distance/resistance
3.2. Overlay techniques
3.3. Contemporary gene flow and multiple regressions
3.4. Problems and prospects (synthesis)

4. Inference of adaptation in real landscapes
4.1. Methods to detect selection at the molecular level (SamBada, BayeScan, BayEnv)
4.2. Taking population subdivision and demography into account
4.3. Integrating evolutionary and functional approaches to infer loci adaptation
4.4. Problems and prospects (synthesis)

Forme de l'évaluation:

Short individual essay (ca. 2000 words, excluding 5-10 references, tables and figures) to be delivered max. 2 weeks after the course. A focal topic will be selected from a provided list highlighting relevant starting-point publications.