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Applications: Sequencing

BIOL 432

Group assignments

Group 1: puRple loosesRife: #93748a

Hayley, Vivian, Sehaj, Anish, Minji

Group 2: GitGood: #ffooff

Kai, Pallavi, Liam, Sarah, Nikita

Group 3: Lustrous Loosestrifes: #9900cc

Claire, Jamie, Nestor, Zoe, Jonas

Research Background

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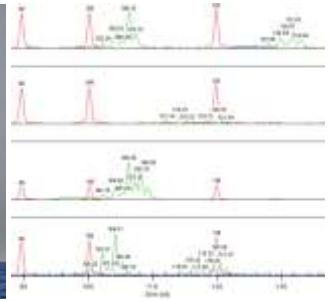
University of Windsor & GLIER – Bsc (Hs), MSc

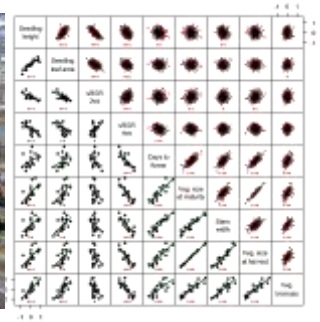


Hugh MacIsaac Dan Heath

University Toronto – PhD



Spencer Barrett

Research Background

@ColauttiLab

Duke University – Postdoc

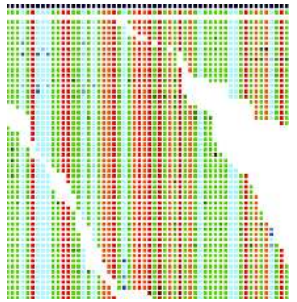



Tom Mitchell-Olds

Jill Anderson

University of British Columbia – Postdoc

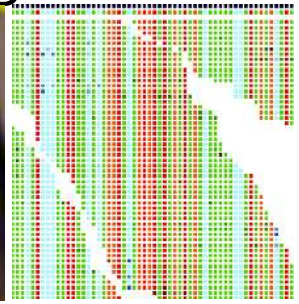


Loren Rieseberg

University of Tuebingen – Postdoc





Oliver Bossdorf

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Rapid Evolution
in novel environments

Ecology & Evolution in the Anthropocene

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Environment --> Natural Selection --> Genome Evolution

Photos by Ed Burtynsky

Invasion Genetics

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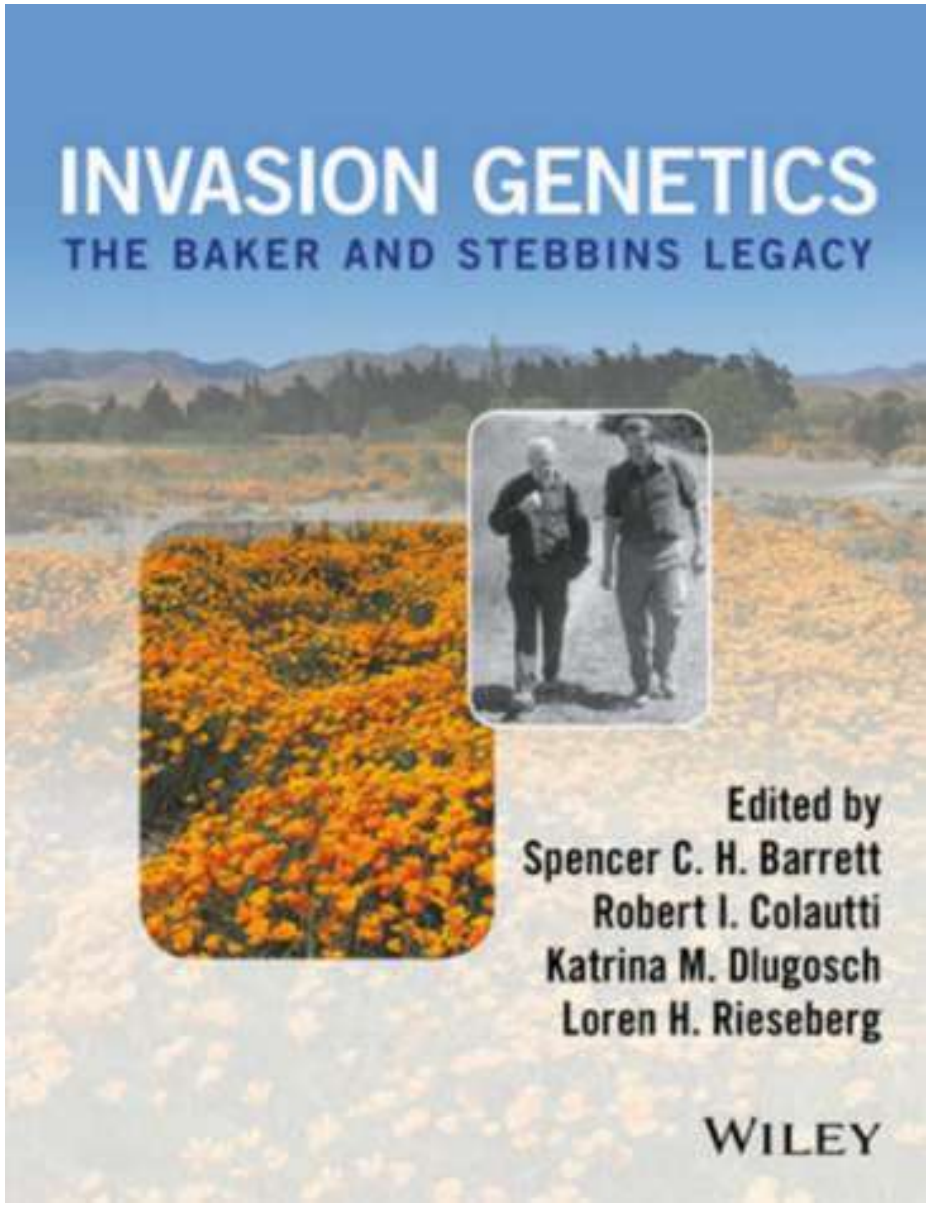

"Invasion genetics of the spiny waterflea"
– Colautti et al. 2005

"Invasion genetics is a relatively new discipline that investigates patterns of genetic variation in populations of invasive species and their ecological and evolutionary consequences."
– SCH Barrett 2016

Ecological and environmental genomics

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"**Invasion genetics** is a relatively new discipline that investigates patterns of genetic variation in populations of invasive species and their ecological and evolutionary consequences."
– SCH Barrett 2016

Ecological & environmental genomics investigate patterns of genome-wide variation in natural populations or species communities, to address ecological and environmental questions.

Methods

Field experiments

Muzz Abdur-Razak

Sierra Klueppel

Eugene Sit

Computation, bioinformatics and data science

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```
> install.packages("baRcodeR")
> library(baRcodeR)
```

eDNA & DNA barcodes for environmental monitoring

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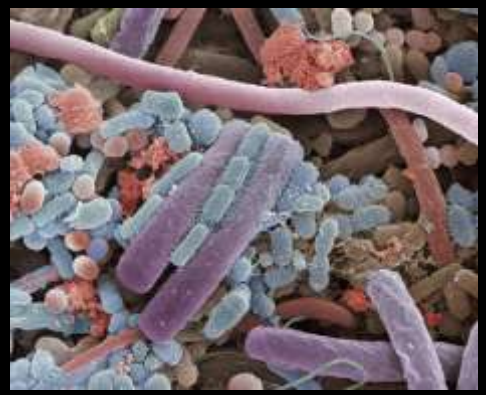
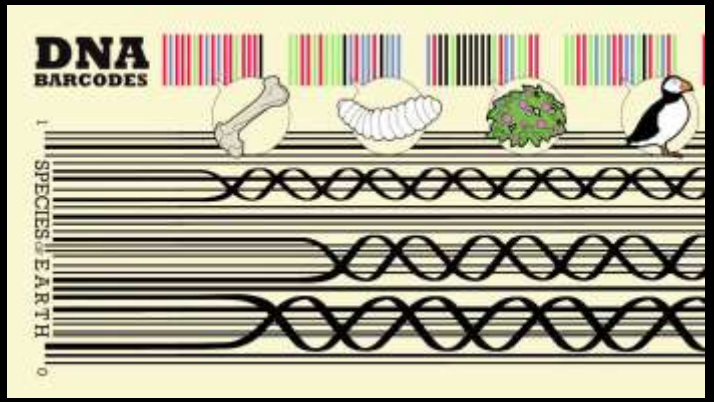


Barcode of Life Project
www.boldsystems.org



https://www.youtube.com/watch?v=ZImiXgU6bCk

Metagenomics of the soil microbiome

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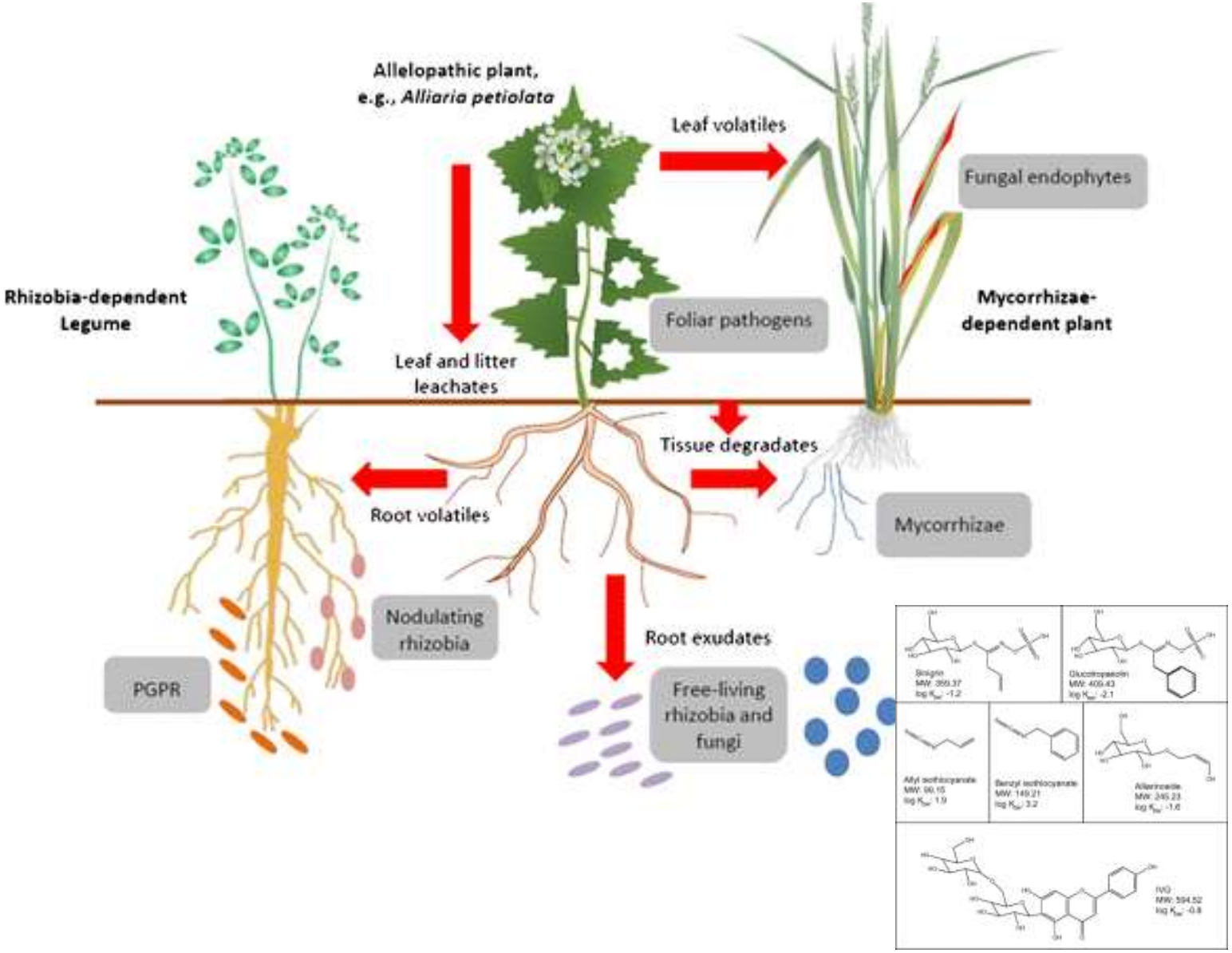

Metagenomics of ticks & their microbiomes

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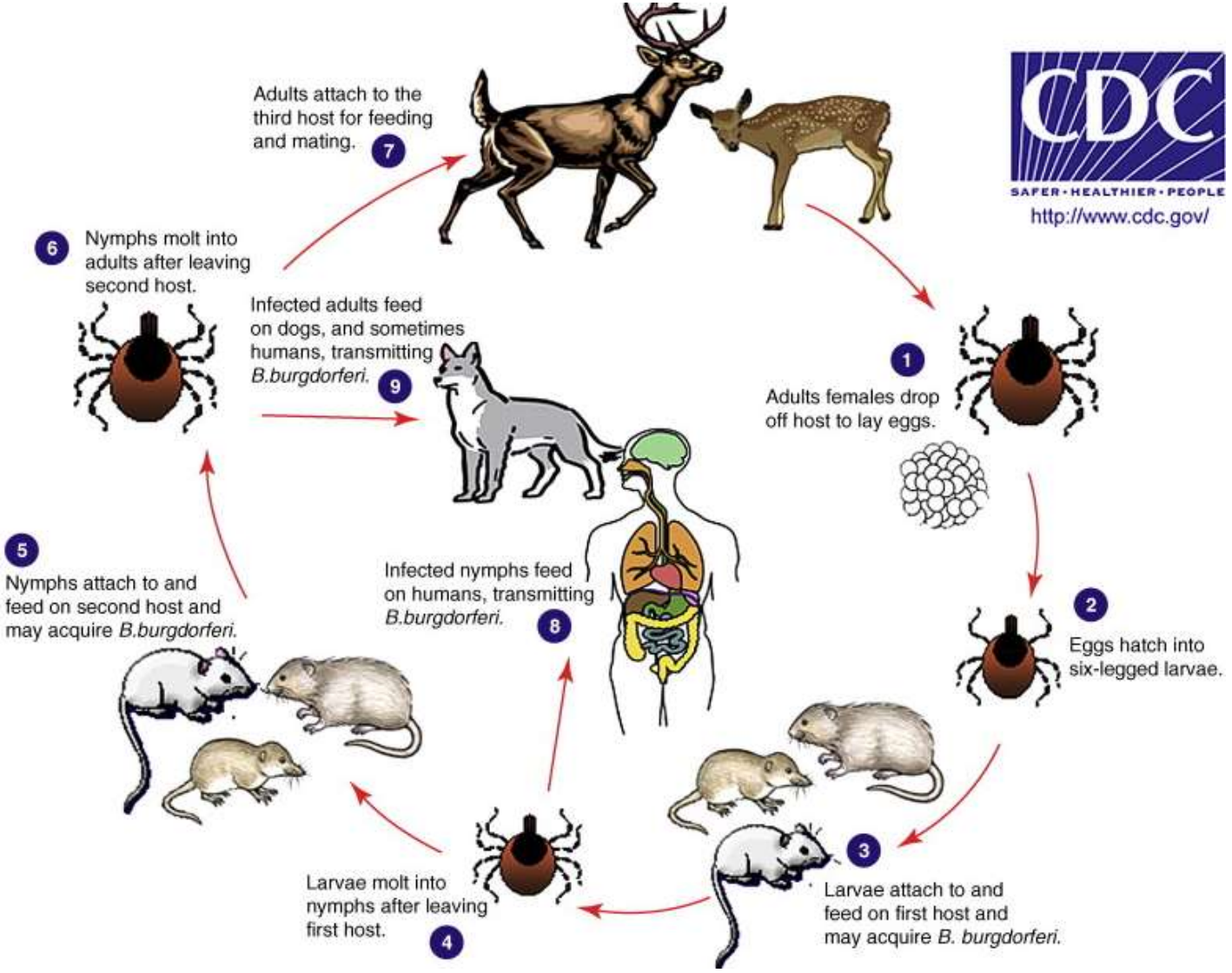
Queen's University



Population genomics

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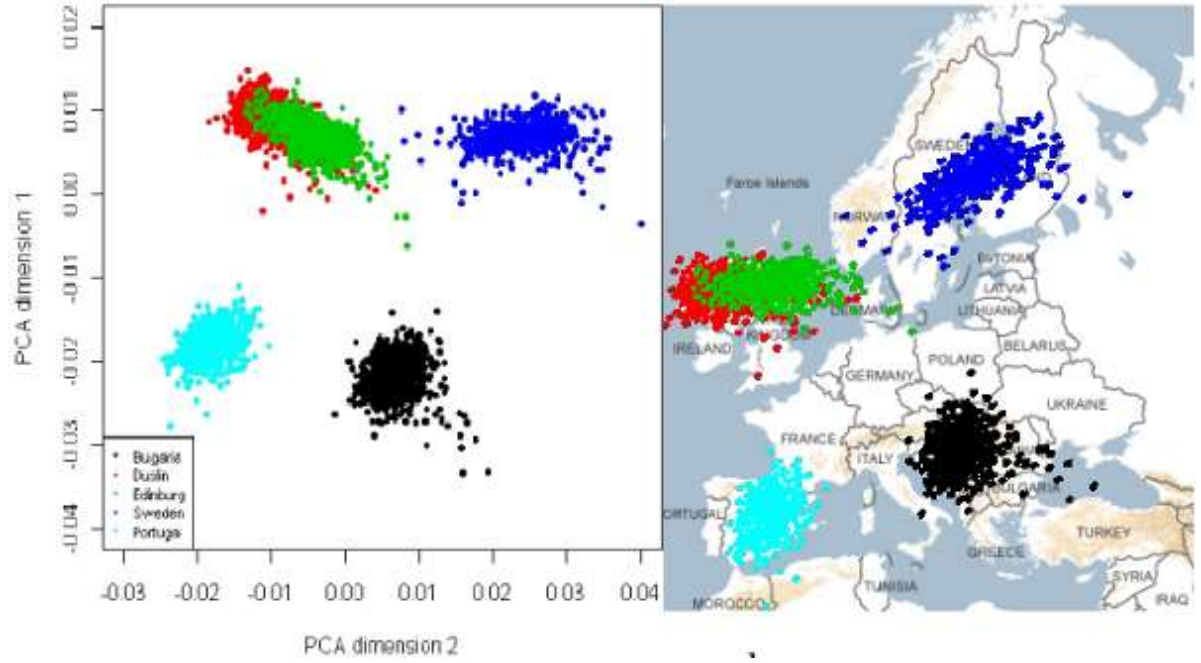

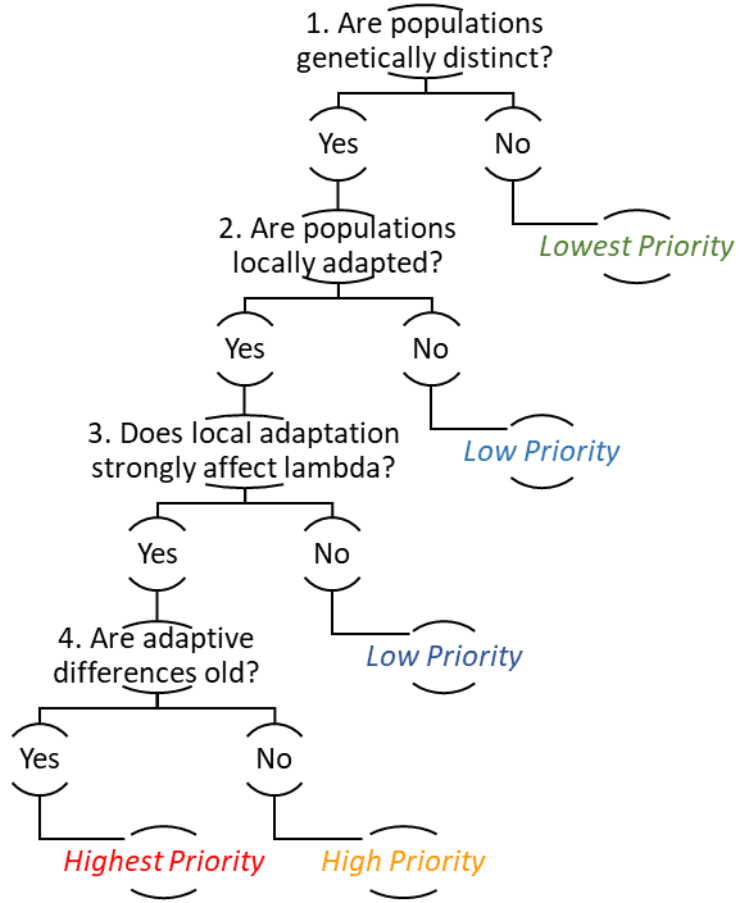

Teaching approach – 3 pillars

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1. **Learn by doing**
    - Hands-on tutorials
    - Independent assignments
    - Group project
2. **Emphasis on transferrable skills**
    - Coding
    - Data Science (collect → manage → visualize → analyze → report)
    - Communication
    - Teamwork
3. **Cumulative learning** – each day builds on previous activities/tutorials

QUIZ – What are the three pillars of our approach?

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1.

2.

3.

Group Introductions

Name

Program

Future Goals (short-term and long-term)

Group team name and hexadecimal colour code

Group member who speaks the most languages