

# Jessica Barbe

## Ecophysiolgist Ph.D. Student



UMR 5023 – CNRS – LEHNA Laboratoire d’Ecologie des  
Hydrosystèmes Naturels et Anthropisés  
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18/12/1994  
 French, Swiss, Spanish  
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### Research interests:

Mitochondrial bioenergetics, efficiency, endotherms, phylogeny, body mass, individual performances

## CURRENT STATUS

2020 – 2023 **Ph.D. in Ecophysiology – University of Lyon, France**  
**Flexibility of muscle mitochondrial efficiency in birds and mammals**  
Supervision: Prof. Damien Roussel and Prof. Yann Voituron (Team Ecophysiology, Behaviour, Conservation)

## EDUCATIONAL BACKGROUND

2019–2020: 2nd year Master of Science Degree “Integrative Physiology in Extreme Conditions PICE” (2/7) Lyon 1

2018–2019: 1st year Master of Science Degree “Integrative and Physiology Biology BIP” (3/46) Savoie Mont Blanc

2015–2018: Bachelor of Science Degree in Ecology (2/61) Savoie Mont Blanc

2014–2015: 1st year Bachelor of Science Degree in Medicine Université de Genève

## RESEARCH EXPERIENCES

2020: Internship (2nd year of MSc) – LEHNA – University of Lyon  
Allometric relationships in birds: mitochondrial energy fluxes and body mass. Prof. Damien ROUSSEL and Prof. Yann VOITURON

2019: Internship (1st year of MSc) – LEHNA – University of Lyon  
Muscle ontogeny of energy metabolism in the king penguin chick (*Aptenodytes patagonicus*). Prof. Damien ROUSSEL

2018: Internship (3rd year of BSc) – UMR 5533 LECA – University of Savoie Mont Blanc  
Biochemical research on the impact of herbivory on ecosystem functioning. Dr. Sébastien IBANEZ

## PRACTICAL AND THEORETICAL SKILLS

### Laboratory technics

- Mitochondrial isolation (*skeletal muscle, heart, liver*)
- Mitochondrial respiration and mitochondrial efficiency (*Rank Brothers®*)
- Cellular respiration (*Respirometers Oroboros®*)
- Mitochondrial reactive oxygen species generation (*Fluorometer*)
- Spectrophotometric assay: Enzyme activities, protein concentration
- Bird and rat dissection

### Fieldwork

- Avian tissue sampling at the farm
- Monitoring of chamois population (Bauges massif)
- Sampling in lake and terrestrial ecosystems
- Counting of birds on the Bourget lake (LPO)

### Softwares

- Biostatistics: RStudio (Frequentist, Bayesian)
- Metabolism: Datlab – Foxy
- Informatics: PowerPoint /Excel / Word

## Theoretical

- Ecophysiology
- Metabolism- Bioenergetic
- Bird and mammal physiology and anatomy
- Basis of ecology
- Phylogeny

## Languages

- French (native)
- Spanish (native)
- English B1-TOEIC (740/990)



## TEACHING

2020-2023: Complementary teaching activities (ACE) 64h/year- University of Lyon1

Practical work - **UE Physiological regulations** - “Thyroid hormones” (3rd year of BSc)

Practical work - **UE Digestive and Energetic Physiology** - “Energy Expenditure” (3rd year of BSc)

Practical work - **UE Enzymology and Metabolism** - “Oxygraphy” (2nd year of BSc)

Tutorial work - **UE Transversals** - “Documentary research”, “MSc jury” (1st year of BSc)



## COURSES

May 2022 (80h): **Diploma Animal Experimentation and Ethics** - University of Lyon, VetAgro Sup

April 2022 (15): Ethics of research - MOOC

February 2020 (1,5h) : Rendre actif les étudiants à distance - Service ICAP

April 2020 (2h) : Webinaire, repérer le plagiat lors des évaluations - Service ICAP



## CONFERENCES

**Allometric relationships between body mass and mitochondrial efficiency of birds -**

Jessica Barbe, Damien Roussel, and Yann Voituron. Annual Meeting EDISS, 3 November 2022 Lyon, France - **Talk**

**Mitochondrial fuel selection in birds and mammals: a question of muscular temperature -**Jessica Barbe, Damien Roussel, and Yann Voituron. Society for Experimental Biology (SEB) - Annual Conference, 5-8 July 2022 Montpellier, France - **Poster**

**Allometric relationships between body mass and mitochondrial efficiency of birds -** Jessica Barbe, Damien Roussel, and Yann Voituron. Society for Experimental Biology (SEB) - Satellite Conference, 3-4 July 2022 Montpellier, France - **Poster**

**Muscular temperature effect on mitochondrial bioenergetics: a comparison between birds and mammals -** Jessica Barbe, Damien Roussel, and Yann Voituron. Meeting of Animal Ecophysiology - 5th Edition, 2-4 November 2021 Montpellier, France - **Talk**.

*Member of the Society for Experimental Biology since 2022*



## SCIENTIFIC PUBLICATIONS

### *Submitted*

J.Barbe, J.Watson, D.Roussel , and Y.Voituron (2023). The allometry of the mitochondrial efficiency is tissue-dependent: A comparison between skeletal and cardiac muscles of birds. Submitted in *Proceedings for the royal society B*.

### *In preparation*

J.Barbe, D.Roussel , and Y.Voituron (2023). Muscular temperature effect on mitochondrial bioenergetics in endotherms.

J.Barbe, D.Roussel , and Y.Voituron (2023). Mitochondrial fuel selection in birds and mammals: a question of muscular temperature

## COLLABORATION

Dr. **A.Stier** (University of Lyon) : Early-life determinants of the hallmarks of ageing: mitochondrial function, oxidative stress, and telomere length

Dr. **B. Rey** (University of Lyon): Mitochondrial function of avian erythrocytes and body mass

## GRANTS

July 2022: Company of Biologists (COB) Travel Grant – £250

2020 – 2023: **Ph.D. grants**, French Ministry of Higher Education and Research (France)

## ADDITIONNAL ACADEMIC ACTIVITIES

2021-2023: Member of the organization of the Annual EDISS Meeting – Communication, sponsor application, moderator of the oral communications and posters sessions

2021- 2022: Organizer of e-seminars: “Let’s talk about antibiotic resistance” and “Research in the current ecological context”