Marc Ferrer, Ph.D.

EXERCISE PHYSIOLOGIST – SPECIALIST IN ENDURANCE & VENTILATORY PHYSIOLOGY

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RESEARCH INTERESTS

Research interests include conducting high-level scientific investigations in **exercise physiology** – particularly in endurance and ventilatory physiology – and leading complex research projects from concept to completion. This interdisciplinary work leverages expertise in kinesiology (human performance, biomechanics) and emerging AI tools to drive innovation in human performance and health.

EDUCATION

Ph.D., Geology –*Polytechnic School of Lausanne (EPFL)*, Lausanne, Switzerland, **2000**

- Dissertation: "Meshing of Complex Shapes in Earth Sciences" – Developed computational methods for 3D geological modeling (included software programming in FORTRAN 90).
- Conducted research/work in hydrogeology and geotechnical engineering during candidacy (see Research Experience).

M.Sc., Kinesiology (Training & Performance) – *University of Lausanne (UNIL)*, Lausanne, Switzerland, **2025**

- Graduate coursework in exercise science, physiology, and data analysis.
- **Master's Thesis:** *"Effects of Inspiratory Muscle Training on Endurance Performance in Trained Athletes under Normoxic and Hypoxic Conditions: A Gender-Based Study"* (Research project conducted 2023–2025, see Research Experience for details).

B.Sc., Kinesiology – *University of Lausanne (UNIL)*, Lausanne, Switzerland, **2022**

- Completed foundational and advanced undergraduate courses in human anatomy, exercise physiology, biomechanics, and sports science.

M.Sc., Education (Teaching) – *High Pedagogic School of Lausanne (HEPL)*, Lausanne, Switzerland, **2010**

- Specialized in pedagogy and educational science. Developed skills in curriculum design, educational research methodologies, and student assessment.

M.Sc., Computer Science for Earth Sciences – *University Pierre et Marie Curie (UPMC)*, Paris, France, **1995**

- Interdisciplinary program combining computer science with geosciences; focus on computational modeling in earth science applications.

B.Sc., Life Sciences & Geology – *University of Sciences et Techniques du Languedoc (USTL),* Montpellier, France, **1994**

- Dual-major undergraduate degree covering fundamental chemistry, biology, geology, and environmental science.

ADDITIONAL TRAINING & CERTIFICATIONS

- **Intensive English Program**, English American School – Denver, CO, USA (Aug 2024 – Dec 2024). *Completed advanced English language training (achieved C1 proficiency)*.
- **A.S. in Exercise Science & Sports Medicine (in progress)**, Arapahoe Community College – Littleton/Denver, CO, USA (Jan 2025 – Present). *Pursuing U.S. credential with focus on exercise science and sports medicine*.
- **Basic Life Support** - American Red Cross - validity 6/2025 - 6/2027

RESEARCH EXPERIENCE

Graduate Researcher (M.Sc. Kinesiology Thesis) – Institute of Sport Sciences, University of Lausanne, Switzerland (2023–2025)

- Conducted a major research project investigating inspiratory muscle training effects on endurance performance under normoxic vs. hypoxic conditions (with gender-based analysis).
- Designed and executed all aspects of the study: secured **IRB approval**, recruited and tested ~50 athletes, and coordinated **200+ lab sessions** for data collection. Tests included maximal oxygen uptake (**VO_2max**) measurements, spirometry, near-infrared spectroscopy (**NIRS**), PhysioFlow cardiovascular monitoring, lactate sampling, etc.
- Processed and analyzed large datasets using statistical software, including Excel, Jamovi, R, and custom scripts in MATLAB.
- **Results**: Prepared findings for publication and co-authored a conference poster presentation at the **2025 International Hypoxia Symposium** (see Publications).

Research Assistant (Biomechanics) – University of Lausanne, Switzerland (Sept 2023 – Dec 2023)

- Supported a faculty-led biomechanics research project on extreme uphill running ("Vertical Kilometer"). Managed motion capture sessions using the **Vicon Motion Capture System** and performed some biomechanical data analysis with **Visual3D** software.
- Assisted in processing kinematic and physiological data to investigate performance determinants in high-gradient endurance events. Collaborated in drafting a report on preliminary findings.

Research Intern (Exercise Physiology) – University of Western Australia (UWA), Perth, Australia (Jul 2023 – Aug 2023)

- Worked under Prof. Olivier Girard in a short-term research internship focusing on sports physiology. Engaged in experimental design and data collection for a project examining athletic performance in challenging environmental conditions.
- Gained international research experience and contributed to data analysis discussions, enhancing skills in cross-disciplinary collaboration and adaptability.

Educational Researcher (Part-Time) – Research Unit for the Piloting of Pedagogical Systems (URSP), Lausanne, Switzerland (2010–2015)

- Conducted applied educational research while teaching part-time. Used LimeSurvey and other tools to design and distribute surveys, collect data, and evaluate educational programs in Vaud canton's school system.
- Analyzed qualitative and quantitative data (interviews, polls, focus groups) to inform policy on student assessment and integration. Co-authored two official research reports on secondary education improvements (2014 and 2015 – see Publications).

Doctoral Researcher (Geology) – EPFL (Ecole Polytechnique Federale de Lausanne), Switzerland (1996–2000)

- Carried out Ph.D. research in geosciences, focusing on developing computational algorithms for 2D and 3D meshing of complex geological formations. This research contributed to more accurate modeling of subsurface structures for engineering and environmental applications.
- Collaborated on several geotechnical and hydrogeology projects: managed drilling campaigns for groundwater assessment in the Lausanne region; developed 3D models of diversion tunnels for the Three Gorges Dam project (China); and monitored environmental impact of former landfill sites.

TEACHING EXPERIENCE

Teaching Assistant – Biomechanics & Computer Science – University of Lausanne (UNIL), Switzerland (Sept 2023 – Dec 2023)

- Assisted professors in instructing undergraduate courses in biomechanics and computer science. Guided students through laboratory exercises (statistics analysis, Excel projects) and helped grade assignments.
- Provided one-on-one tutoring and support to students, improving their comprehension of complex concepts at the intersection of physiology and computational analysis.

Teaching Assistant – Geology – EPFL, Switzerland (1996–2000)

- Served as a graduate teaching assistant during doctoral studies. Led lab sessions and field exercises for B.Sc. geology courses.
- Mentored undergraduate students in topics such as modeling, geophysics, and field mapping techniques; received positive feedback for clarity in explaining difficult concepts.

Secondary School Mathematics & Science Teacher – Ecole Nouvelle de la Suisse Romande (ENSR) & College du Belvedere, Lausanne, Switzerland (2000 – 2024)

- Taught mathematics and general science at the middle-school and high-school levels for 24 years. Consistently achieved strong student performance in national examinations through engaging instruction and individualized support.
- Mathematics Department Head (2020–2024): Led the math department, coordinating curriculum and pedagogy across grade levels. Mentored teaching staff and introduced innovative teaching methods. Spearheaded the development of a pilot enrichment course, “Mathematical Discoveries,” to enhance problem-solving skills among high school students.
- Curriculum and Assessment Development: Created and edited mathematics exam content for canton-wide high school assessments (2014–2024), ensuring alignment with educational standards.
- Academic Leadership: Actively contributed to school administration and policy. Served as the school’s representative on the Lausanne Schools Council, working with education officials to integrate support for students with special needs and to implement pedagogical improvements (2020–2022).

PUBLICATIONS AND PRESENTATIONS

- **Raberin, A., Ferrer, M., Sax, A., Favre, M., & Millet, G. P. (2025)**. *Sex-differences in the effectiveness of respiratory muscle training for hypoxemia and maximal performance in hypoxia*. **Poster** presented at the International Hypoxia Symposium 2025, Banff, Canada.
- **Ntamakiliro, L., Ticon, J., & Ferrer, M. (2015).** *Vers une différenciation des épreuves cantonales de référence de dixième année*. Renens, Switzerland: URSP (Research Unit for School Pilotage), Report No. 164. (Assessment of differentiated standardized testing at 10th-year level.)
- **Pulzer-Graf, P., & Ferrer, M. (2014).** *Quel rôle pour le renfort pédagogique dans l'intégration? Analyse d'un nouveau dispositif destiné à soutenir la scolarisation d'élèves à besoins particuliers dans l'enseignement régulier*. Renens, Switzerland: URSP, Report No. 160. (Analysis of a new support system for integrating students with special needs into regular education.)
- **Maréchal, J.-C., Parriaux, A., Bensimon, M., Bürgi, C., Ferrer, M., Franciosi, G., Perrochet, P., & Tacher, L. (1997).** Assessment of the incidence of underground works on groundwater resources. In **Proceedings of the International Symposium on Engineering Geology and the Environment** (pp. 2763–2768). Athens, Greece: 23–27 June 1997.

(Ph.D. Dissertation: Ferrer, M. (2000). ***"Meshing of Complex Shapes in Earth Sciences."*** EPFL, Lausanne.)

SKILLS

- **Computer & Data Analysis:** Proficient in R, MATLAB, Python, and Jamovi for statistical analysis and data visualization; experienced with MS Office suite; working knowledge of FORTRAN 90 (used in doctoral research).
- **Physiology & Lab Techniques:** VO_2 max and metabolic cart testing (conducted 200+ tests), spirometry, **NIRS** (Near-Infrared Spectroscopy) for muscle oxygenation, PhysioFlow for hemodynamic monitoring, **DEXA** scanning for body composition, **BodPod** air-displacement plethysmography, force platform gait/force analysis, blood lactate testing, motion capture systems (**Vicon**), and biomechanical analysis software (**Visual3D**).
- **Geoscience:** Background in geophysical surveying, geochemistry lab techniques, hydrogeological field methods, and operation of analytical instruments like SEM (Scanning Electron Microscope) from early career research.
- Soft Skills: Demonstrated **interdisciplinary approach** to problem-solving; strong analytical and critical thinking abilities; leadership experience (headed academic department); excellent collaboration and team management skills; autonomous work ethic and adaptability in multi-cultural research environments.

LANGUAGES

- English: Professional working proficiency (advanced/C1 level)
- French: Native proficiency (mother tongue)
- Spanish: Elementary proficiency
- Catalan: Elementary proficiency

REFERENCES

- Grégoire Millet, Ph.D. – Associate Professor, Institute of Sport Sciences, University of Lausanne, Switzerland. (Email: gregoire.millet@unil.ch – Phone:+41 21 692 11 11)
- Olivier Girard, Ph.D. – Associate Professor, School of Human Sciences, University of Western Australia, Australia. (Email: olivier.girard@uwa.edu.au – Phone:+(61) 4222 38754)
- Antoine Raberin, Ph.D. – Junior Lecturer/Researcher, University of Lausanne, Switzerland. (Email: antoine.raberin@unil.ch Phone: +41 21 692 37 96)
- Davide Malatesta, Ph.D. – Senior Lecturer, Institute of Sport Sciences, University of Lausanne, Switzerland. (Email: davide.malatesta@unil.ch – Phone: +4121 692 36 17)