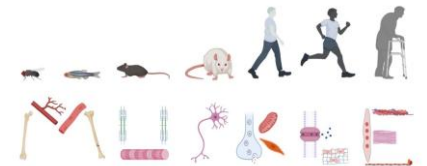


Master 2 Musculo-Skeletal System, Locomotion, Exercise (MuSkLE)



Master MuSkLE

International Excellence Program

Head : Pr Vincent Pialoux

Field of teaching unique in France :

From the molecular to the integrative level of the Musculo-Skeletal system

- **All courses in English** - 20 students maximum per promotion (> 50% foreigners)
- **Disciplines:** Cell biology, Physiology, Biomechanics, Kinesiology, Health, Sport sciences
- **10-months internship** in one of the 19 research teams of the MuSkLE consortium
- **Incentive Scholarships** in addition to the usual internship gratification (for foreign students) :

Call for MuSkLE Excellence Scholarships

Program 2025-2026 of the Master 2 MuSkLE

Unit Type	Full name of the Units	ECTS	Lecture (h)	Tutorial (h)	Lab work (h)
6 ECTS among	<i>Musculo-Skeletal system - Locomotion</i>				
UE	Mechanobiology	6	36		
UE	Fundamental and clinical myology	6	36		
UE	Muscle function and locomotion	6		30	
UE	Biomechanics of the locomotor system	6	33	9	18
12 ECTS among	<i>Musculo-Skeletal system - Fundamental</i>				
UE	Development and stem cells in Plants and Animals	6	36		
UE	Muscular cell physiology	6	36		
UE	Physiology of metabolic homeostasis	6	36		
UE	Experimental and modeling principles in biomechanics	6	14	20	26
UE	Cardiovascular physiopathologies	6	24	12	
6 ECTS among	<i>Musculo-Skeletal system - Exercise and human performance</i>				
UE	Molecular genetics of neuromuscular disorders	3	12	6	
UE	Tissue morphogenesis and repair	3	7,5	10,5	
UE	Exercise physiology	6	36		
UE	Performance optimization: biomechanical and neuronal factors	6	26		
UE	Sciences 2 : Physical activity and chronic pathologies	6		33	
6 ECTS among	<i>From cell biology to skeletal muscle function</i>				
UE	Innovative in vitro models	3	12		12
UE	Advanced bio-imaging	3	12	7,5	9
UE	Aging and cell death	3	13	5	
UE	Comparative physiology in extreme environment	6	36		
UE	Metabolic and nutritional physiopathologies	6	24	12	
UE	Pharmacology, toxicology and study models	6	34,5	25,5	
UE	Motor disability and optimization of motor function	6	36		
UE	Advanced exercise physiology and biomechanics	6		45	
6 ECTS among	<i>From cell morphogenesis to human performance</i>				
UE	Molecular mechanisms of cell signalling	3	10	8	
UE	Shaping the cell: from architecture to function	3	14	2	
UE	Physiology of energy homeostasis	6	24	12	
UE	Functional investigation : from gene to patient	6	36		
UE	Design animal research: certif lab. animal sciences Level 1/B	6	44	6	6
ENS	Sciences 1 : Muscular biomechanic - MuSkLE	6	13,5	3	10,5
30 ECTS	Internship				
UE	Internship in laboratory	30			

Cellular level

Tissular level

Integrative level

Master Musculo-Skeletal system, Locomotion, Exercise

Master 2 MuSkLE pathway graduates for 3 Mentions of Master depending academic history and study field :

- Integrative Biology and Physiology (BIP)
- Training and Optimization of Sports Performance (EOPS)
- Mechanics (Mécanique)

Pedagogic contact: vincent.pialoux@univ-lyon1.fr

Administrative contacts:

- ✓ Mention EOPS: Gestion-MUSKLE-STAPS@univ-lyon1.fr
- ✓ Mention BIP: Scolarite.Biosciences@univ-lyon1.fr
- ✓ Mention Mechanics: Scolarite.Mecanique@univ-lyon1.fr

More information

Major requirements (non-exhaustive list)

- 1 year of Master obtained before July 2025 in the field of Cell biology, Physiology, Biomechanics, Kinesiology, Health, Sport sciences
- Excellence of the academic background
- Internship and technical skills
- Letter of motivation
- Advanced contact with one of the team of the [MuSkLE](#) consortium

How to apply

<https://ecandidat.univ-lyon1.fr/lyon1.fr/>

Application period:
April 13th 2025 – May 31st 2026