



Myogenesis Gordon Research Seminar and Conference – June 2023 (Xhem Qabrati, ETH Zürich)

Between June 10 and 16, 2023, I had the pleasure of attending the Gordon "Myogenesis" research seminar and the conjoined conference that took place in the picturesque village of Barga in Tuscany, Italy. The rather remote location of the venue, only reachable by steep serpentines, proved to be difficult to access, a fact that, as I learned during the coming days, was not at all a disadvantage for a scientific conference.

The two days prior to the conference were organized as a seminar for trainee attendees with speaker and poster sessions, where I, along with several other PhD students and postdocs, had the opportunity to give a short talk on my PhD project. These sessions had a welcoming and collegial atmosphere for trainees of different levels to engage in scientific discussion and develop first personal contacts.

Even though following the literature about the molecular mechanisms of muscle regeneration has been an integral part of my PhD work, I was astonished by the width and diversity of topics outside of my immediate area, ranging from newly identified types of myocytes in embryonic myogenesis to new treatment approaches for myotonic dystrophy or understanding how the circadian clock regulates muscle regeneration.

Of particular interest was an afternoon session focusing on the career prospects of trainee researchers, either in academia or in a business or industrial setting. Panelists consisted of academic principal investigators as well as a research group leader in industry who gave their advice and points of view based on their backgrounds and later provided answers to questions raised by the trainees. Additionally, throughout the week, senior PIs were encouraged to sit together at a table with trainees for breakfast or lunch to informally meet and greet and to discuss career questions and options.

The choice of this year's keynote lectures indicated a clear direction for where the field of muscle cell biology is likely heading in the future. Ibrahim Cissé, the director of the Max Planck Institute of immunobiology and epigenetics, gave an inspiring lecture about his lab's pioneering work bridging physics and biology by establishing single-molecule super-resolution imaging that allows to visualize regions of active gene expression in real time. This permits conclusions about genome architecture and transcriptional regulation, a recurring topic during the week that was subsequently discussed in the second keynote lecture by Thomas Rando, who reviewed the detrimental epigenetic alterations occurring in muscle stem cells upon aging, leading to impaired regeneration, and how an aging metabolism is a key driver of epigenetic modifications. Aging and associated events such as chronic inflammation, cancer, muscle wasting, and altered metabolism and their effects on muscle regeneration crystallized as the overarching topics discussed during this conference, possibly anticipating the medical needs of our increasingly aged society.

In my own work, I am, among others, interested in understanding the molecular signature of muscle stem cells at different stages of regeneration, which has been known to be regulated both intrinsically and extrinsically. This notion is particularly relevant to designing therapy approaches for myopathies showing regeneration defects. Several talks showing new developments in muscle stem cell quiescence and activation helped me to understand that the activation state of muscle stem cells is crucially influenced by a variety of extrinsic factors and surrounding cells, in particular by fibroadipogenic progenitors, components of the extracellular matrix, levels of immune activation, and metabolic function. These new perspectives opened new angles of interpretation for my own data. Additionally, I learned about a number of molecular assays and techniques that could be adapted for my own experiments as well.

In summary, this year's Gordon "Myogenesis" seminar and conference were a highly enjoyable meeting featuring excellent cutting-edge science presented by leaders in the field from all over the world.