SEMINAR: Transcriptional reprogramming drives adaptation to the light environment in Chlamydomonas

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ICFO Elements Room

Light signaling regulates key processes in photosynthetic organisms, including germination, phototaxis, and chloroplast biogenesis. Understanding how these are regulated at different levels will allow us to understand how plants and algae adapt to changing environments, including light stress. To investigate chloroplast biogenesis, we use the Chlamydomonas yellow-in-the-dark mutants, which lack chlorophyll and contain an etioplast-like plastid in darkness but rapidly develop functional chloroplasts upon light exposure. A time-series transcriptomic study during this dark-to-light transition showed that 40% of the transcriptome rapidly responds to light, including genes for chloroplast biogenesis and photoprotection. When chloroplast signal was triggered, transcriptional changes mirrored those of high light. We propose that transcriptional reprogramming in the convergence of light and retrograde signals fine tune chloroplast biogenesis and adaptation to the prevailing environment in Chlamydomonas.

Hosted by: Prof. Dr. Nicoletta Liguori