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## Fortifying crops against stress factors

By understanding the molecular fundamentals of photosynthesis under various environmental conditions, we pave the way for fortifying crops against stress factors.

This includes:

- Characterizing regulatory mechanisms: our scientists delve into the regulatory mechanisms governing photosynthetic electron transport under stress in cyanobacteria, green algae, and plants. This knowledge is essential in fortifying crops<sup>1</sup>
- Identifying key genes: we identify genes responsible for the storage of essential metal micronutrients (Fe, Zn, Mn) and nitrate in plants, enhancing their resilience and nutritional value<sup>2-4</sup>

## Innovative plant protection strategies

Understanding the complex interactions between plants and pathogenic bacteria enables us to propose innovative strategies against biotic stress. Our approach includes:

- Targeted pathogen analysis: using advanced transposon-sequencing techniques, we identify novel targets in pathogens such as *Agrobacterium* and *Dickeya*. Additionally, our development of diagnostic molecular tools, like TaqMan, ensures precise pathogen identification<sup>5</sup>
- Harnessing actinobacteria's potential: exploring the specialized metabolism of actinobacteria, we uncover compounds with multifaceted applications. These compounds exhibit antifungal properties and elicit plant defense responses, offering sustainable biocontrol solutions<sup>6</sup>



## Fields of expertise

- Biology of photosynthetic organisms
- Photosynthesis
- Metal homeostasis
- Physiology and metabolism of bacteria
- Synthetic biology

## Technical skills

- Multi-Omics and Interactomics
- Forward and reverse genetics
- Nanosensors
- Chlorophyll fluorescence
- Microfluidics and root chip fabrication
- Elemental analysis
- Structural prediction and modeling of multimolecular complexes
- Molecule screening and drug binding analysis
- Calculation, storage, use of bioinformatics software (development of workflows, data processing), online tools and services

## References

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5. Torres, M. et al. *New Phytol* 233, 905-918 (2021)
6. Nicolle, C. et al. (2024)