

# Seeds of Uncertainty

## How plants hedge their bets for survival

Plants with identical genes and grown in identical environments display unique characteristics.

- Single Plant Omics
- Single Cell Omics
- Photon Count Imaging
- AI and Computer Modelling

Imagine planting two identical seeds in the same pot with the same soil and sunlight. You'd expect them to germinate at the same time and grow the same way—but sometimes one germinates sooner, grows taller or blooms faster. That's not because the seed is "better" or the conditions were truly different—it's because of tiny random differences in gene expression. We call this stochasticity.

### Our research aims to:

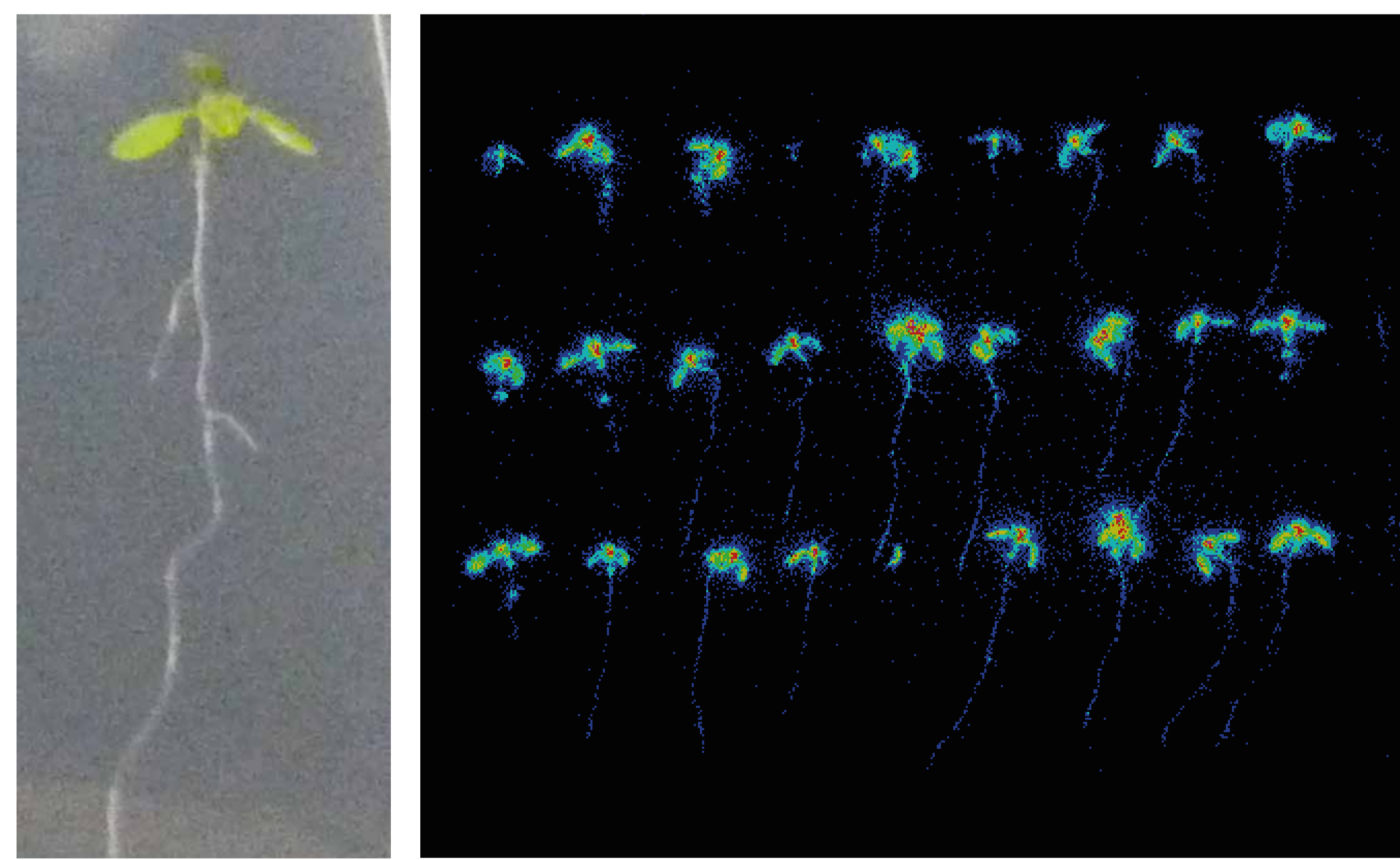
- Identify how variability is generated and the role of stochasticity
- Predict which plants are more likely to survive a stress event like heat or drought

### Can you spot the differences?



Illustration by Sandra Cortijo.

### Some plants are always ready

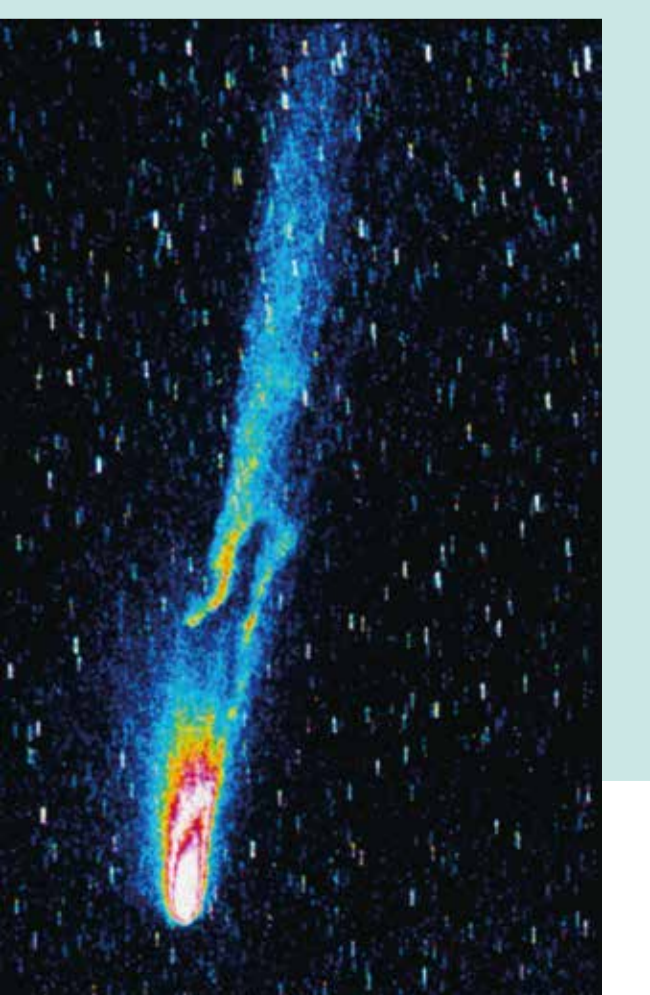


These seedlings underwent heat stress. Images by Dora Cano Ramirez.

A few plants in every population are primed to survive unexpected stresses. They're essentially hedging their bets.

Looking at genes' activity using firefly bioluminescence we can see the difference in response to stress.

The camera we use to study gene expression through bioluminescence was originally designed to see Halley's Comet in 1986.



Which plant do you think will survive a hot summer day?