

Leaf Protoplast scRNA-Seq
(ppRNA-Seq) using the
Nadia Innovate

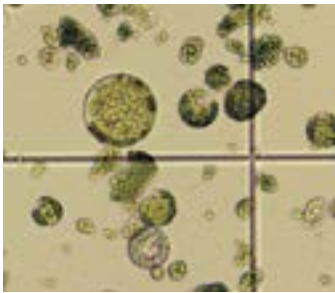


dolomite
bio

Leaf Protoplast scRNA-Seq (ppRNA-Seq)

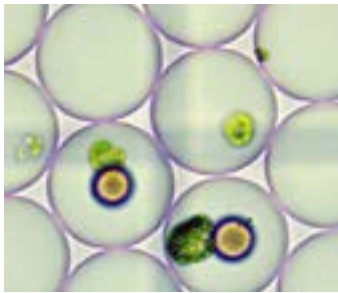
Large-scale transcriptomic studies of single protoplast cells from plant tissues have generally lagged behind those of animal models. Unlike many mammalian cell types, which dissociate from each other more readily, plant tissues require intense enzymatic digestion and specific buffer conditions to be accessible for conventional single cell and microfluidic techniques. We have produced transcriptomic data from *Arabidopsis thaliana* leaf protoplasts using ppRNA-Seq, showing the flexibility of the Nadia Innovate system for a plethora of cell types and sample buffers.

Arabidopsis leaf protoplasts



- *A.thaliana* protoplasts suspended in WI buffer
- Leaf protoplasts displayed little sign of osmolysis and minimal debris

Encapsulated protoplasts



- ppRNA-Seq run on Nadia results in monodisperse droplets of ~90 µm diameter
- Droplets containing hard oligo-dT capture beads and intact plant leaf protoplasts

Plant protoplast samples



Plant cells

Plant protoplasts

Median number of genes

1455

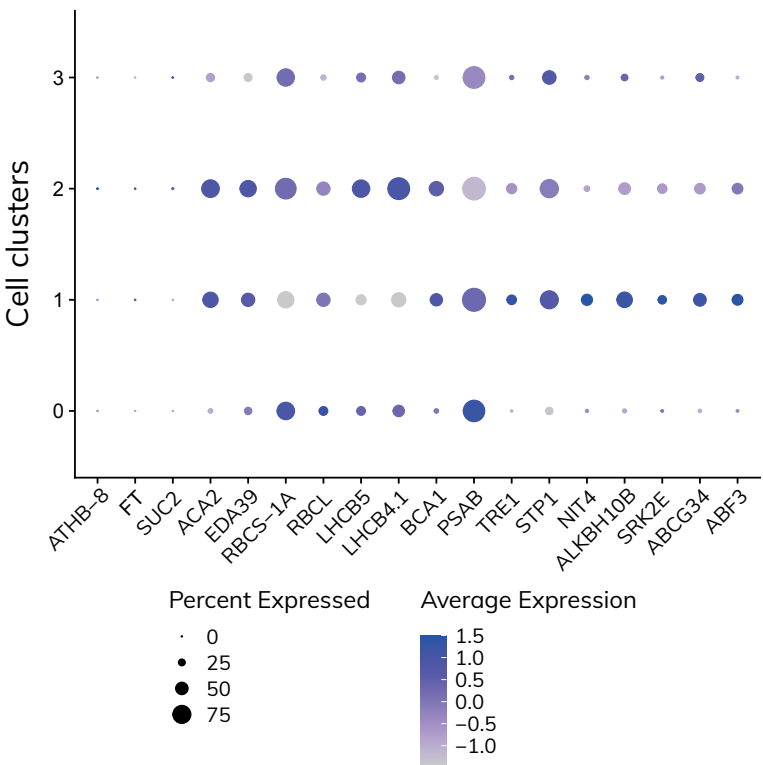
Median number of UMIs

2800

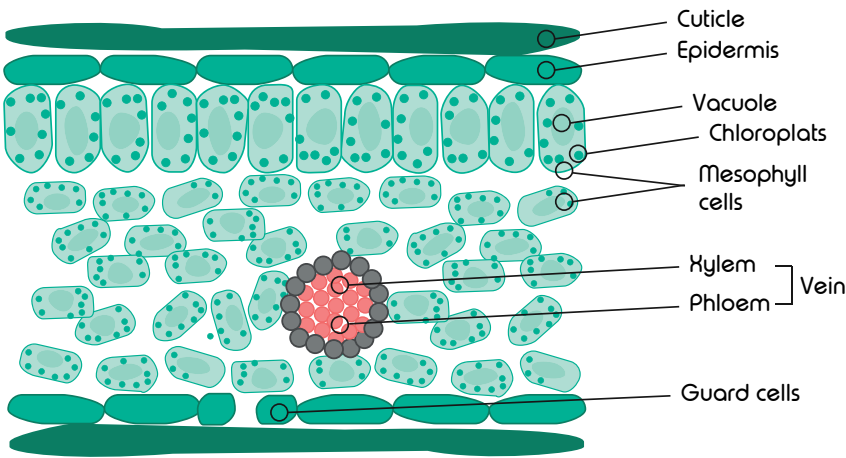
Expression of Arabidopsis leaf marker genes

The dotplot displays the percentage of cells expressing selected genes (dot size) as well as the average expression level of genes based on transcript counts (colour intensity). Rows correspond to identified cell clusters, presenting the expression of cell types marker genes.

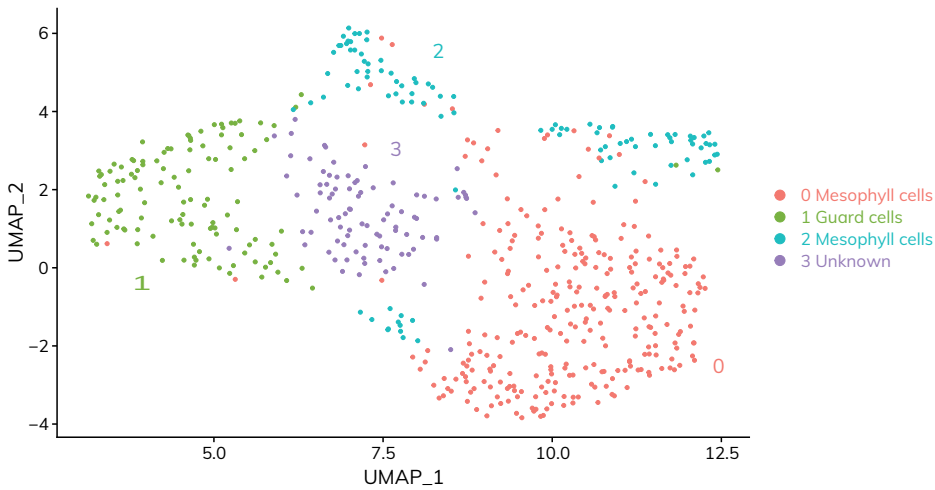
- Expression of ATHB-8, FT and SUC2 could not be detected suggesting that vasculature was successfully excluded during sample preparation.
- Genes from ACA2 to PSAB are markers associated with mesophylls cells (cluster 0 and 2).
- Genes from TRE1 to ABF3 represent markers associated with guard cells (cluster 1).



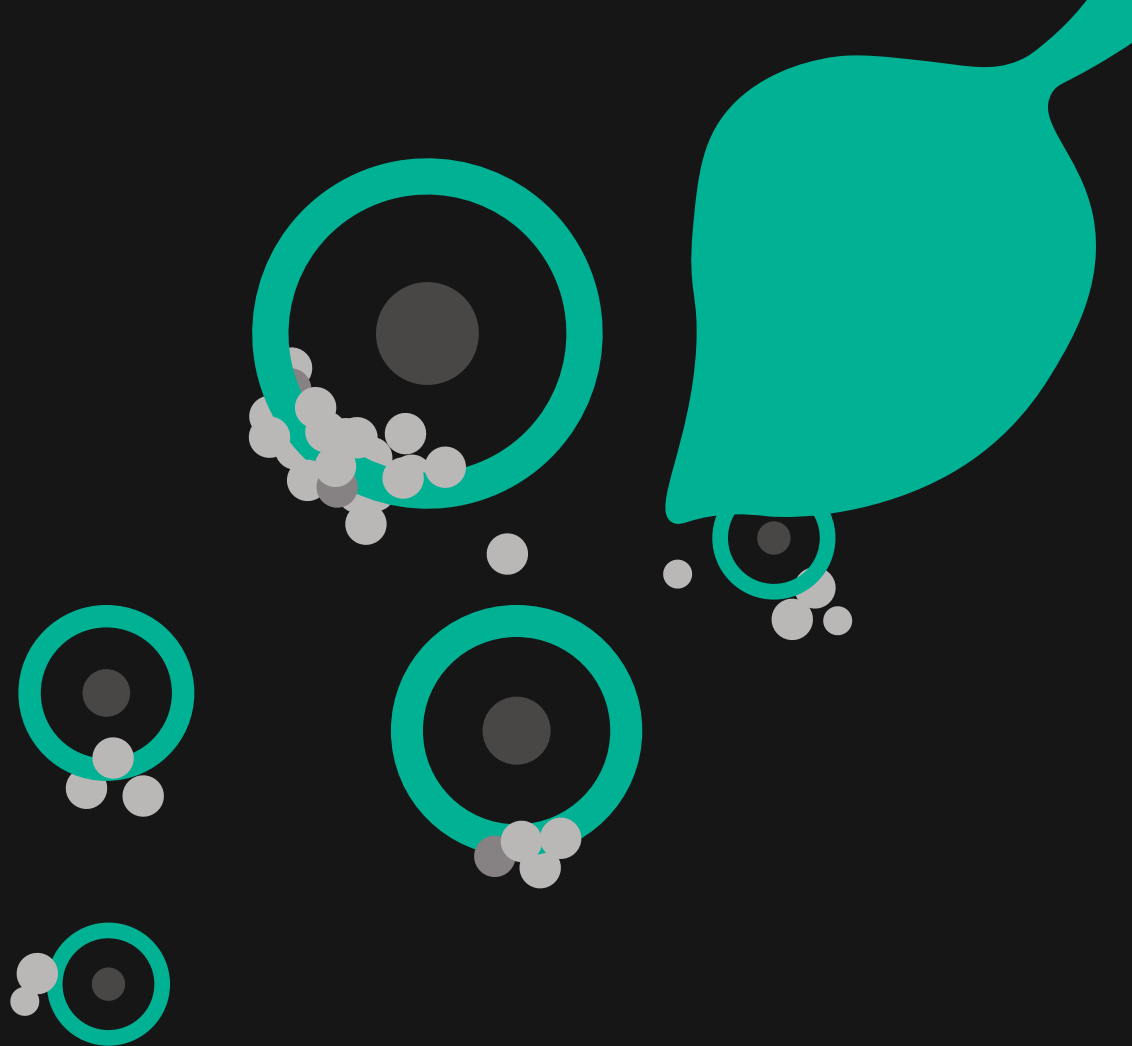
Plant Leaf cross section



Single cell atlas of Arabidopsis leaf protoplasts



The uniform manifold approximation and projection (umap) visualization reveals 4 clusters. Two clusters (0 and 2) were associated with mesophyll cells and cluster 1 with guard cells.



Get in touch

Email
info@dolomite-bio.com

Join us on



UK Head Office
(Europe, S.E. Asia,
Australasia, China, Middle
East, Africa)
t: +44 (0)1763 252 102

North America Office
t: +1 (617) 848 1211

Japan Office
t: +81 45 263 8211

Asia Regional Office
t: +84 93 555 60 80