

European Plant Embryology Consortium (EURO-PEC)

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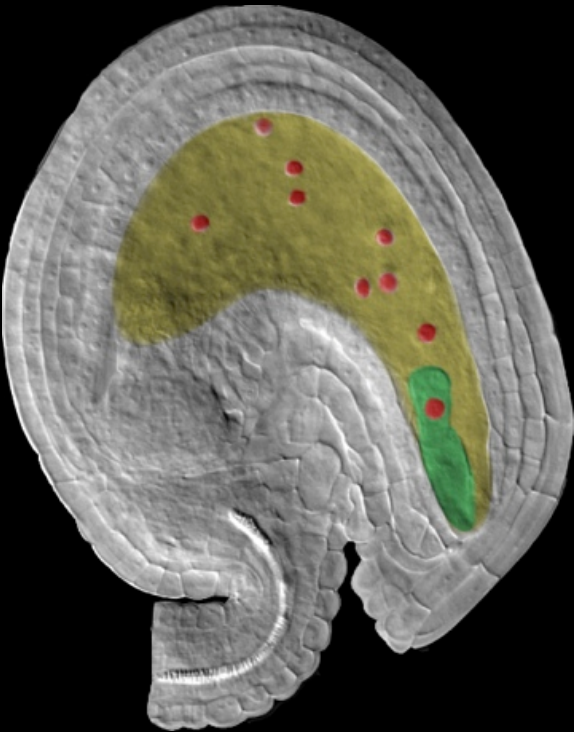


ERA-CAPS

ERA-NET for Coordinating
Action in Plant Sciences



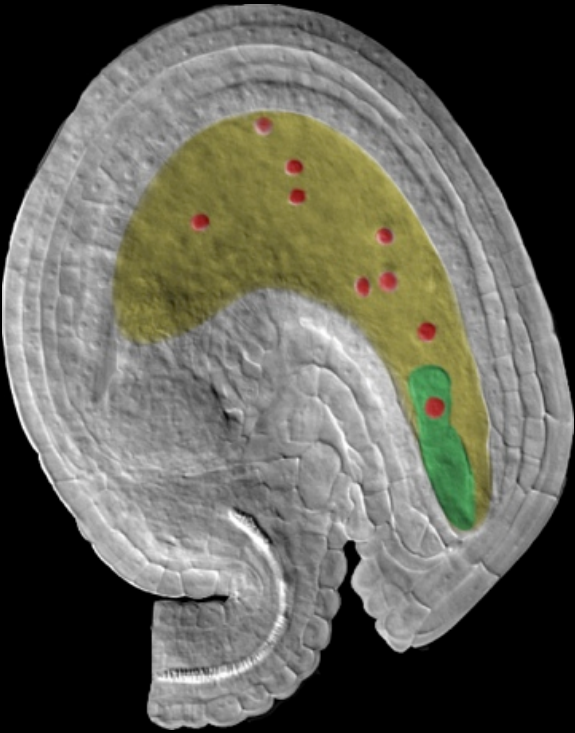
How do multicellular organisms develop from zygotes?



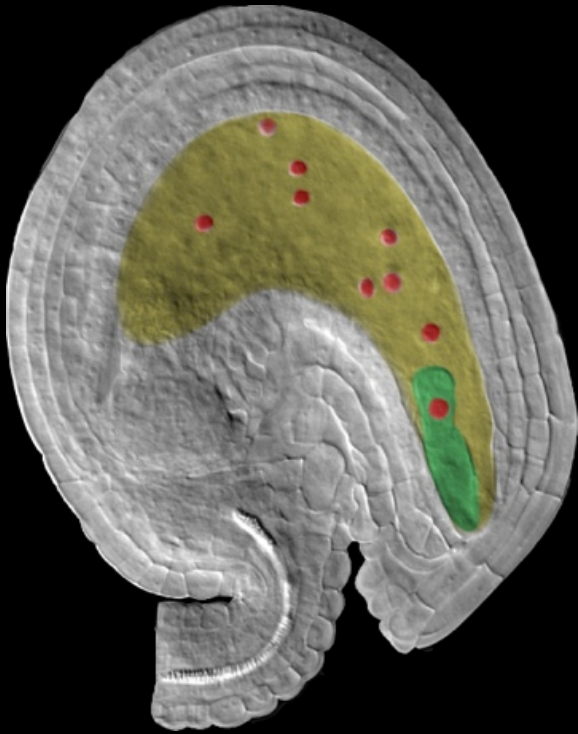
?



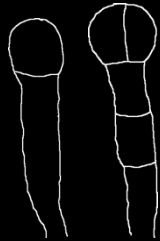
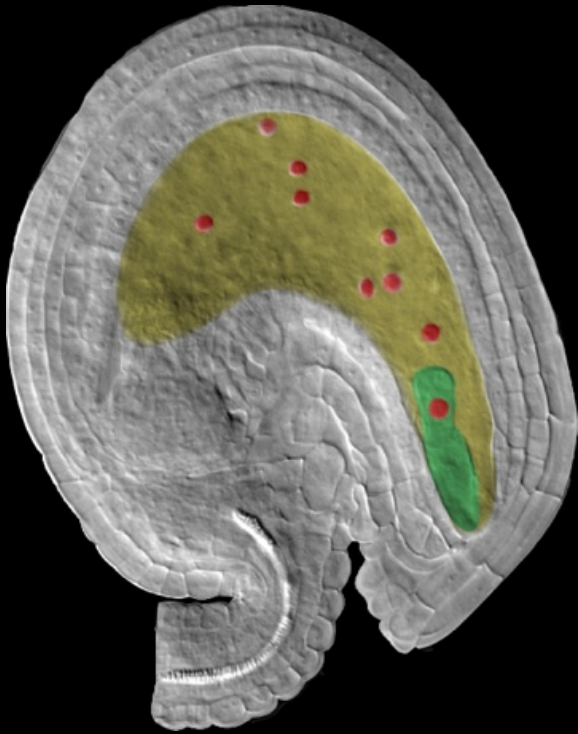
The plant body plan is established during embryogenesis



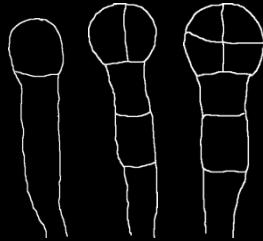
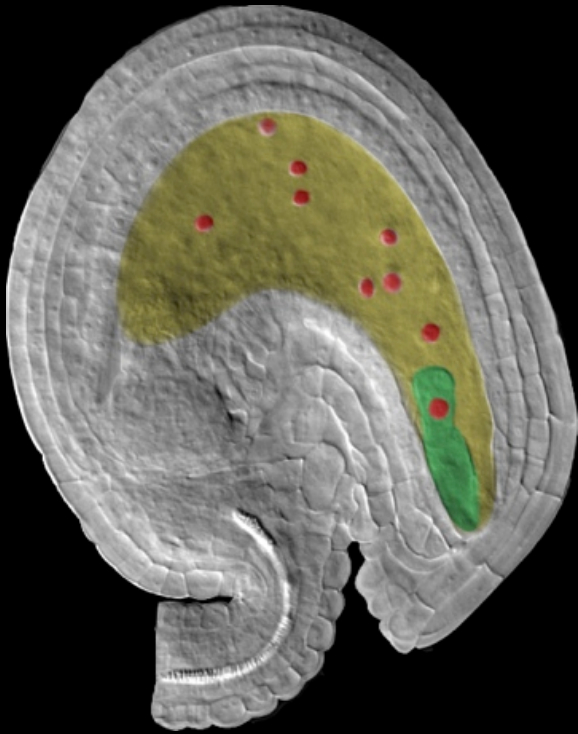
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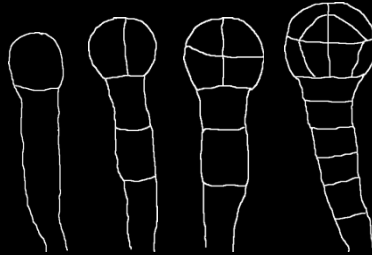
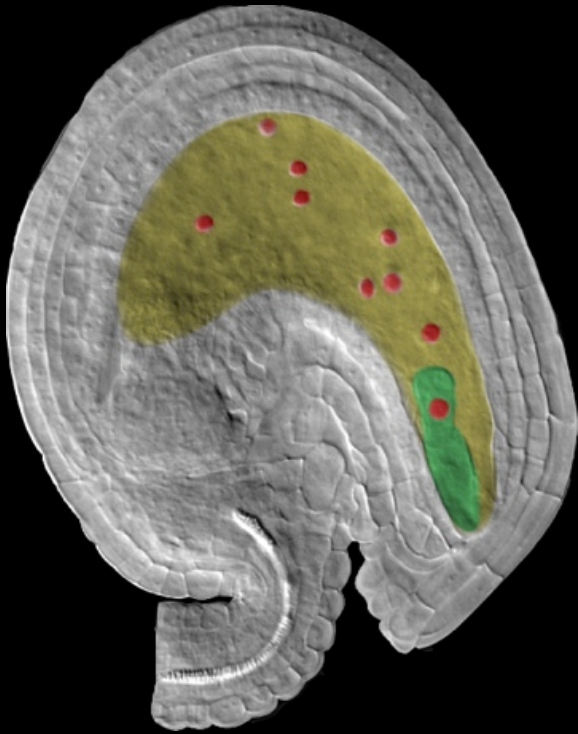
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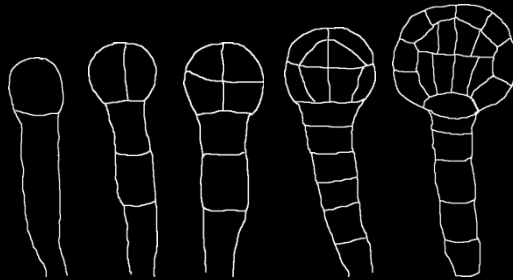
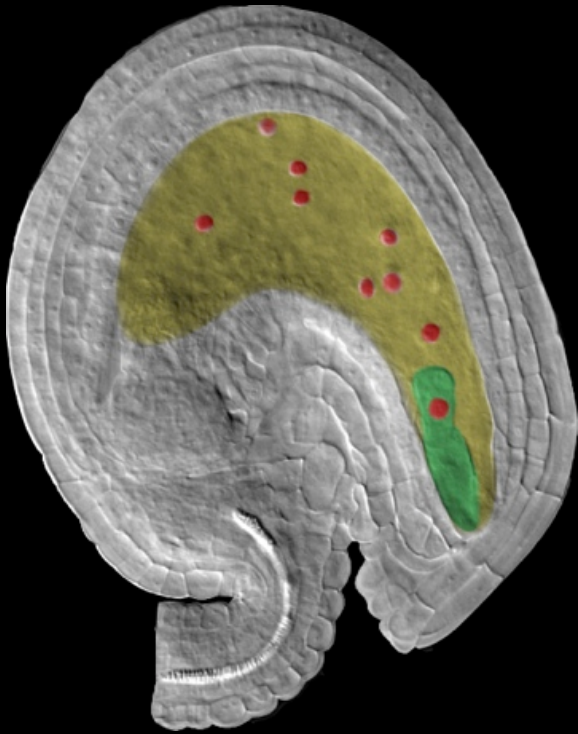
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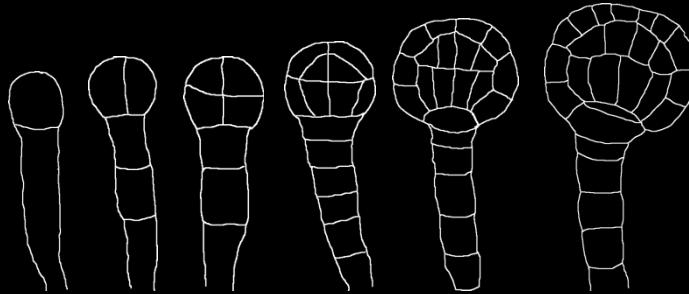
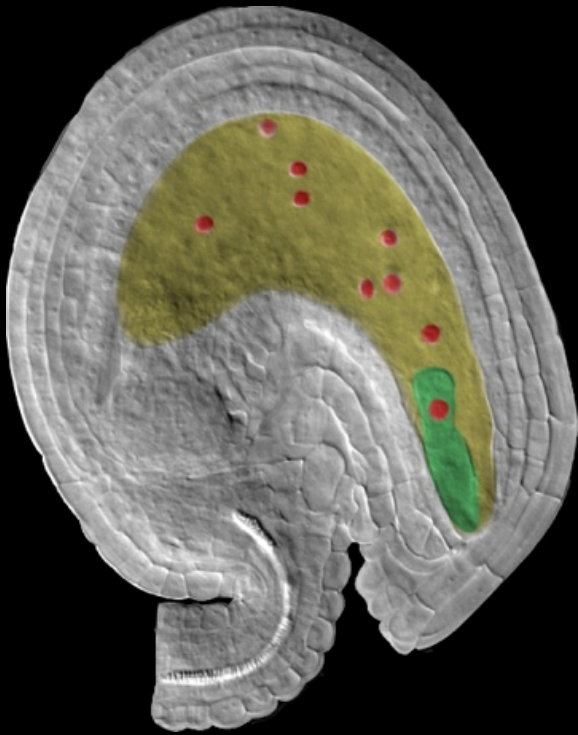
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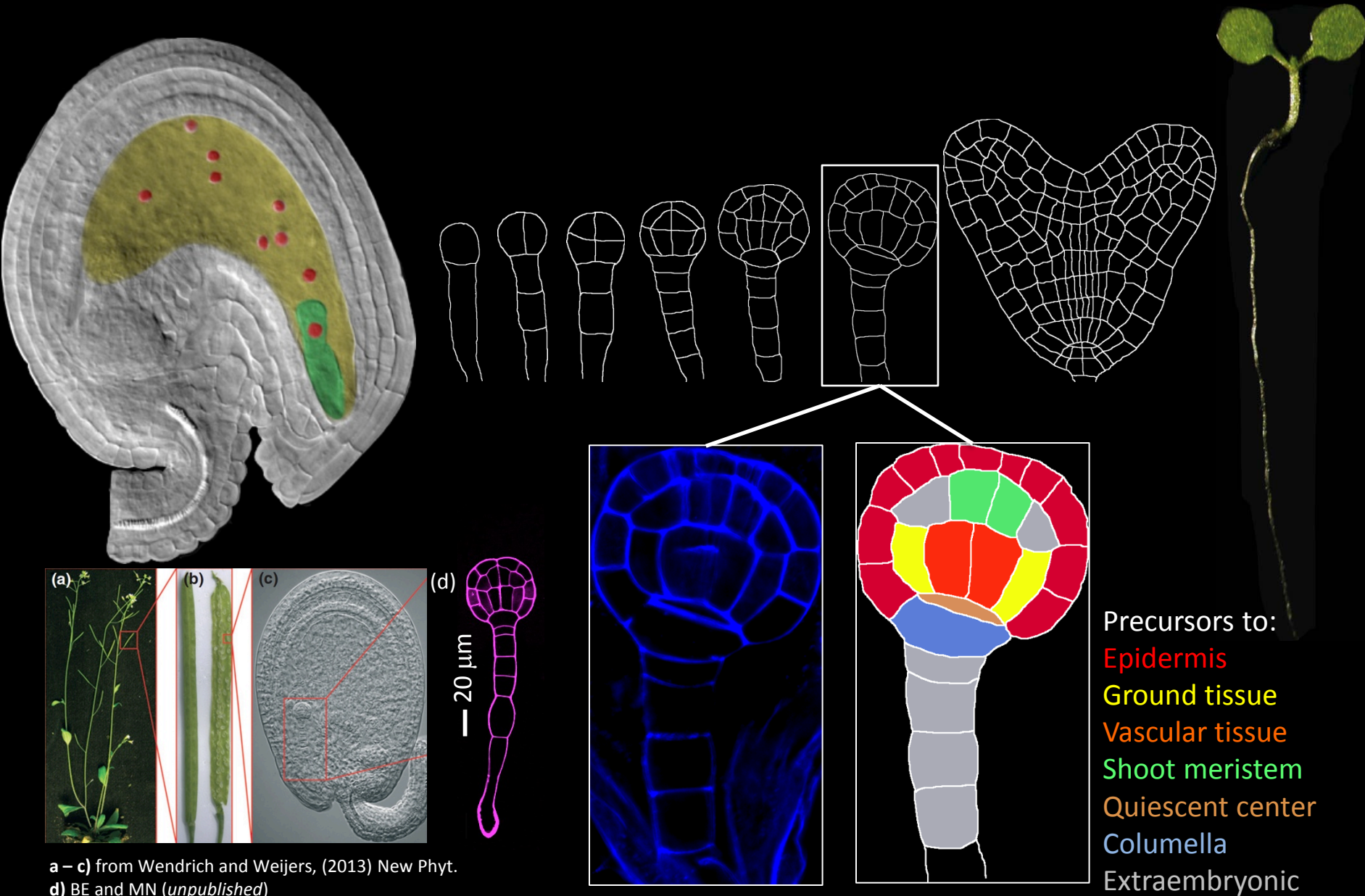
The plant body plan is established during embryogenesis



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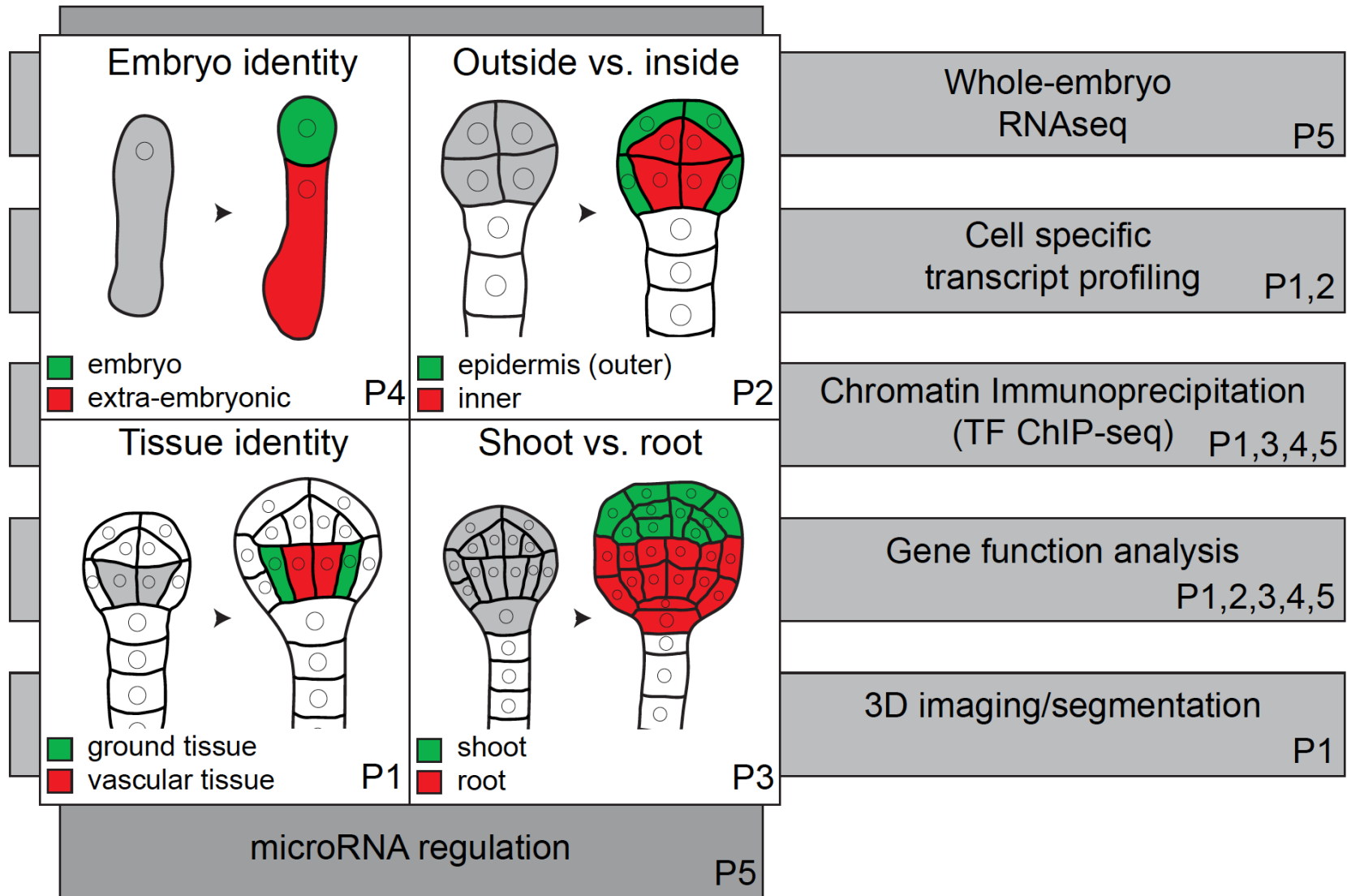


The plant body plan is established during embryogenesis

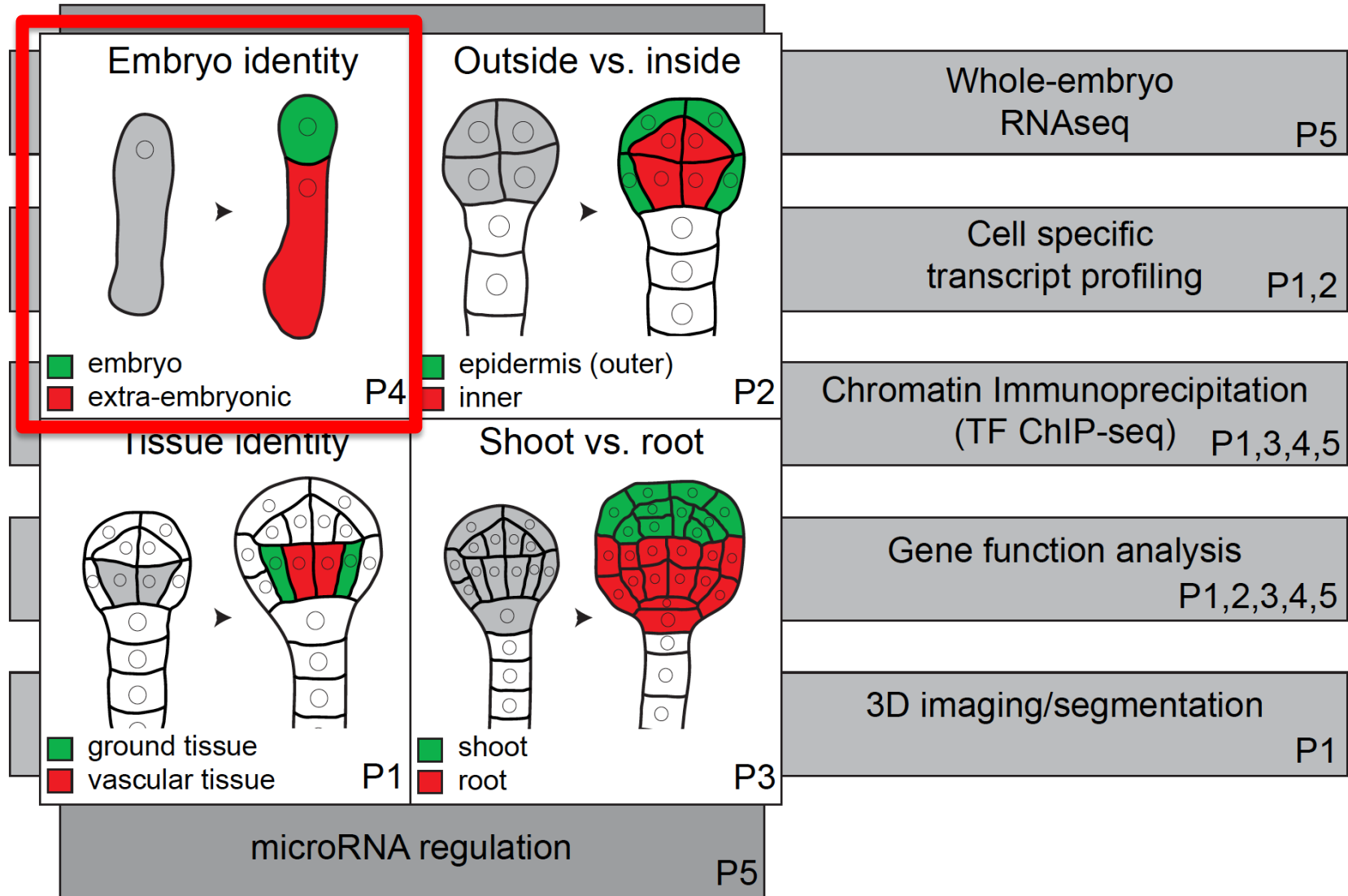


a – c) from Wendrich and Weijers, (2013) New Phyt.
d) BE and MN (unpublished)

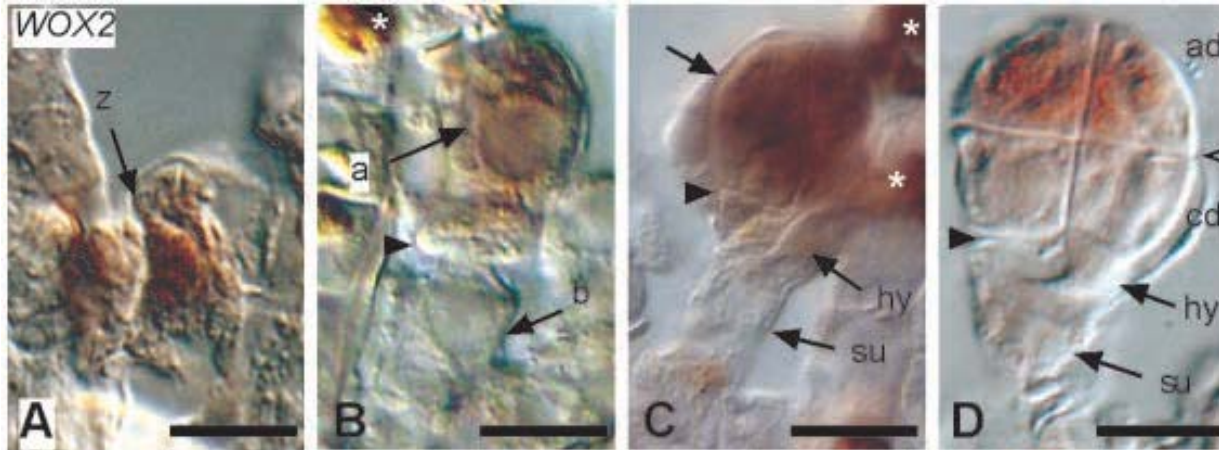
Project Objectives: Identify molecular basis of body plan formation



Workpackage A (Laux Group): Specification of embryonic identity by *WOX* genes



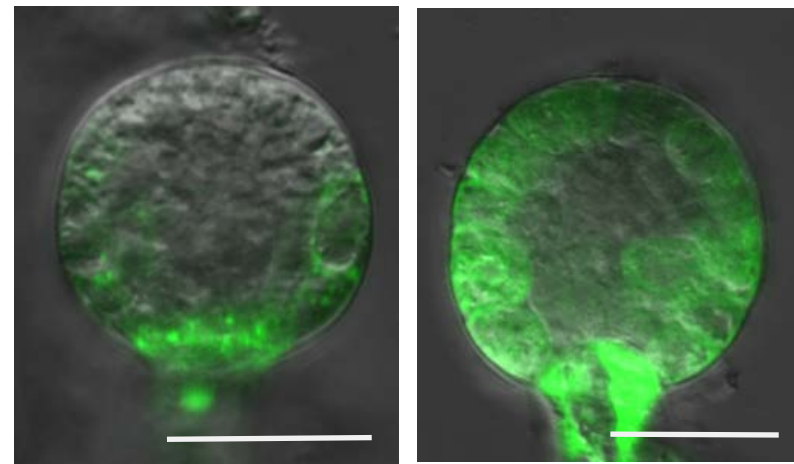
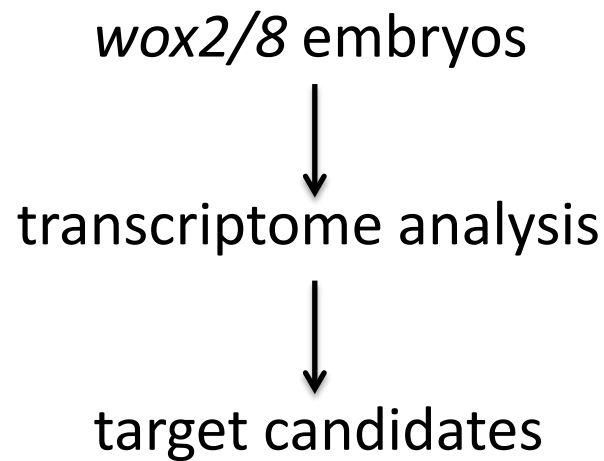
Laux Group: Embryonic vs. extraembryonic identity



WOX2 transcription factor is early marker of embryonic lineage

Haecker_Laux (2004) *Development*

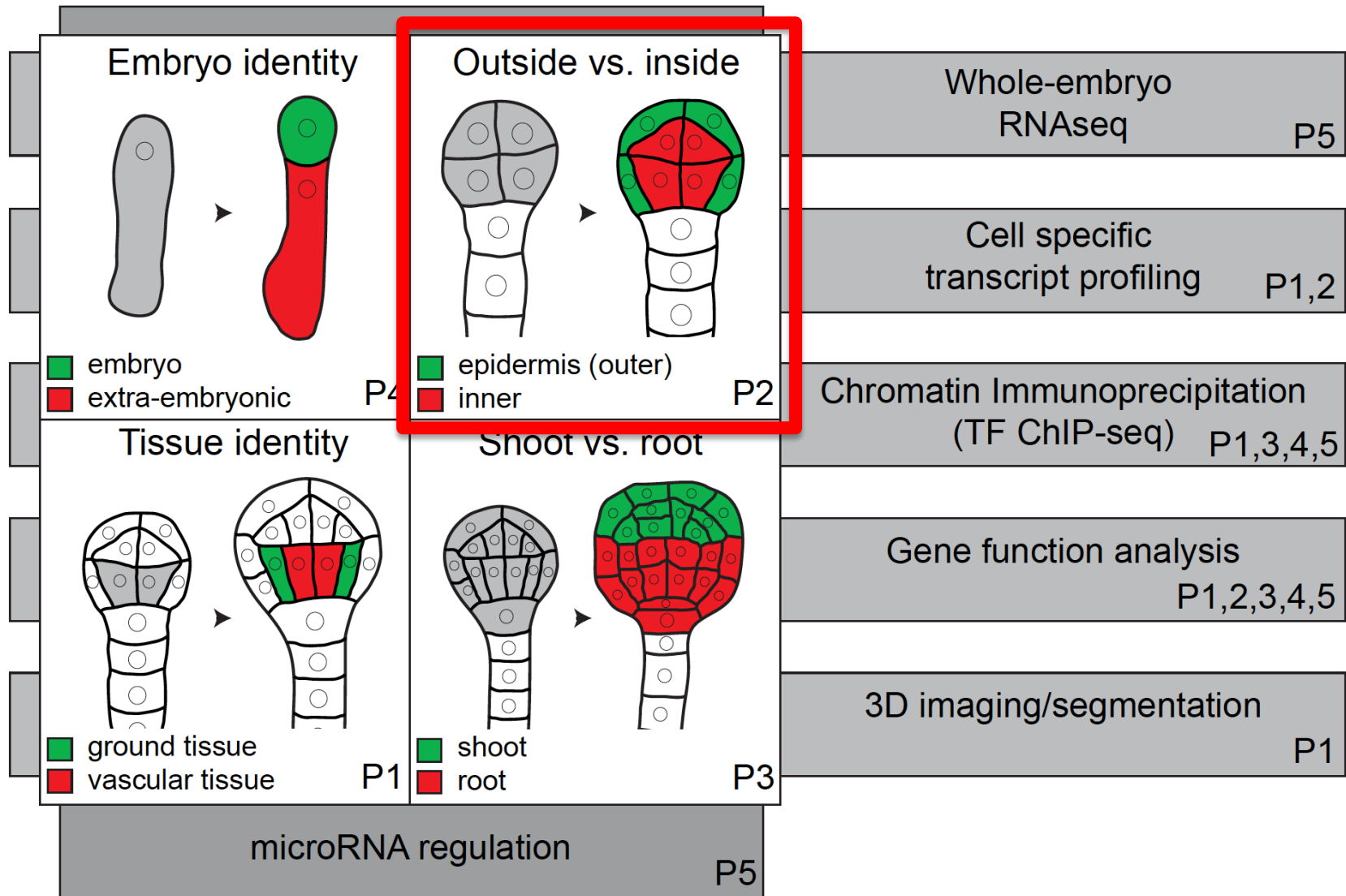
Candidate wox target 23



Wild-type

wox2/8

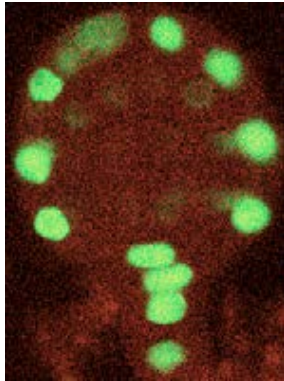
Workpackage B (Jürgens Group): Specification of outer and inner cell identities



Jürgens Group: Specification of outer and inner cell identities

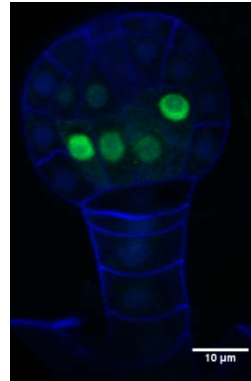
Identification of GFP marker lines for sorting of cell-specific nuclei

outer cells



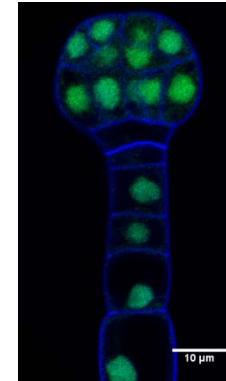
pATML1::NLS3xGFP
Takada & Jürgens 2007

inner cells



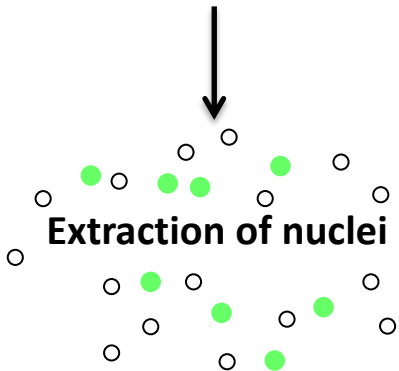
Q0990>>
NLS3xGFP

whole embryo

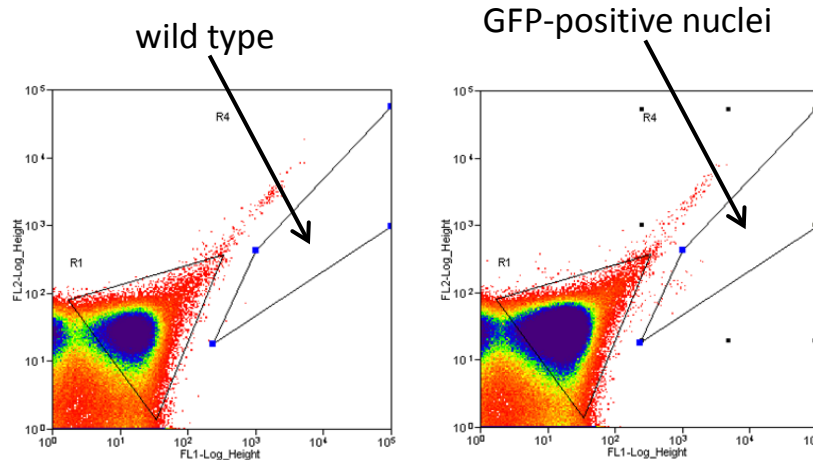


pAT3G10010::
NLS3xGFP

GFP-tagged nuclei
in cells of interest



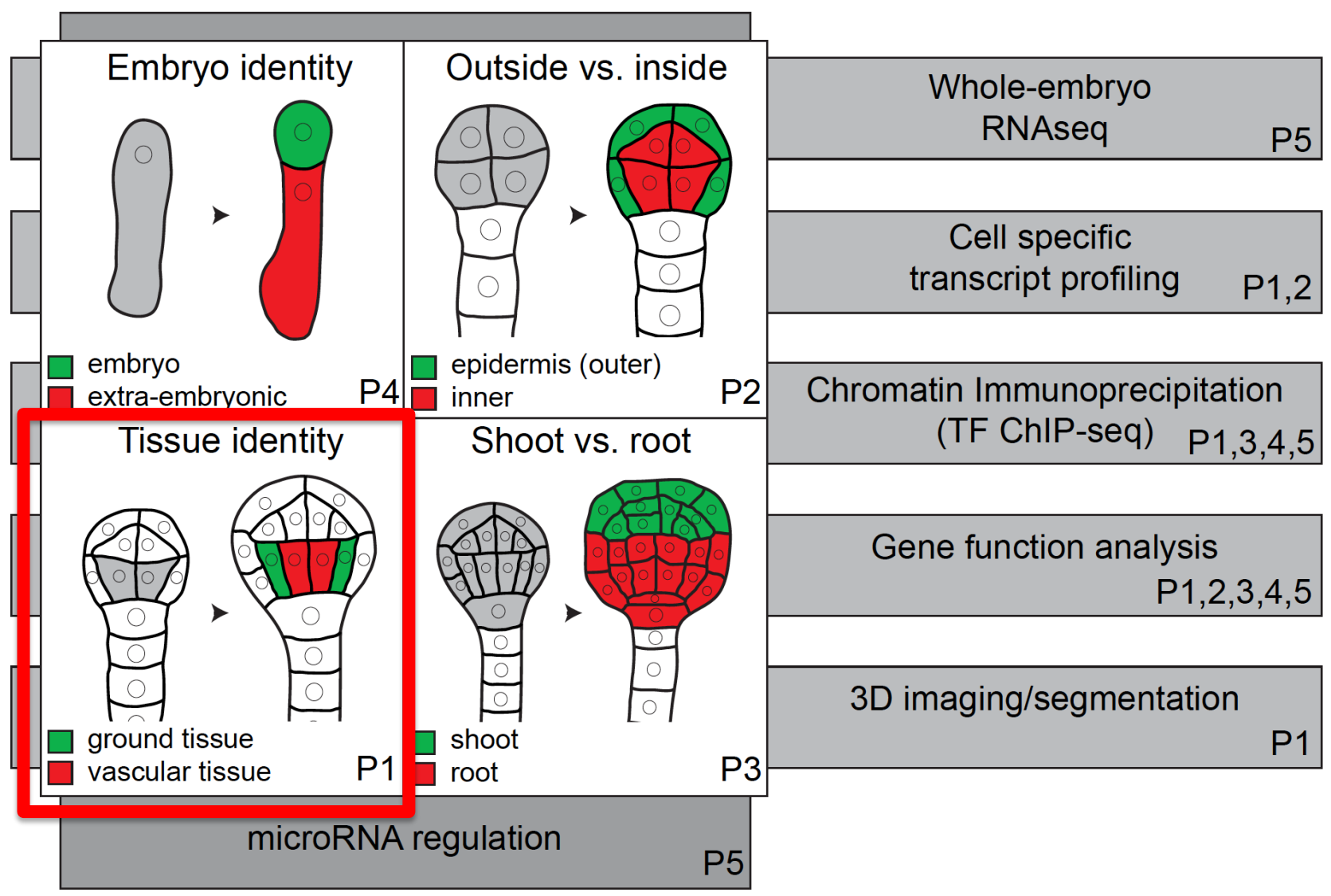
Fluorescence activated nuclear sorting (FANS)



RNA isolation and
amplification

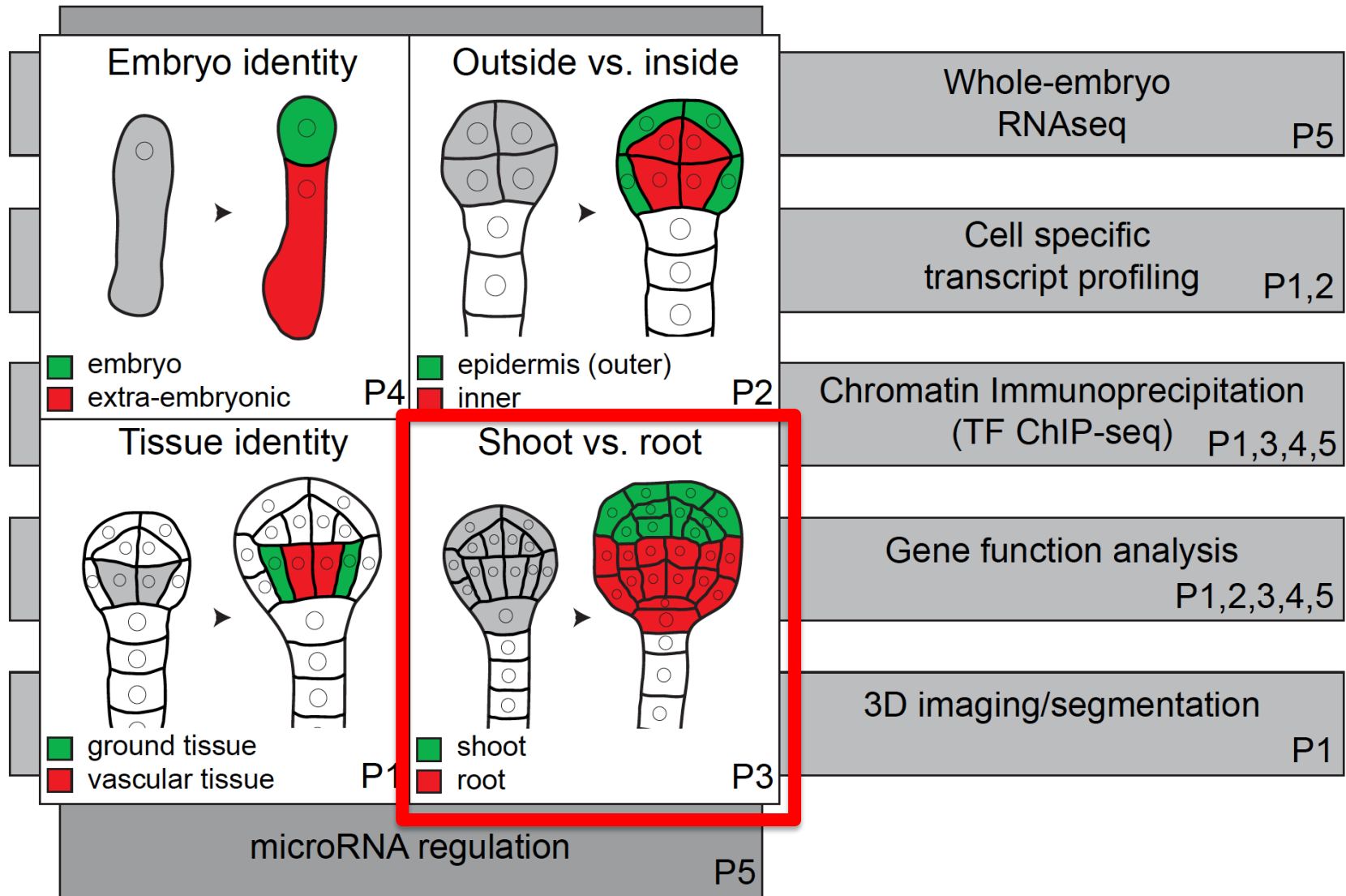
RNA-Seq

Workpackage C (Weijers Group): Specification of vasculature and ground tissue precursors



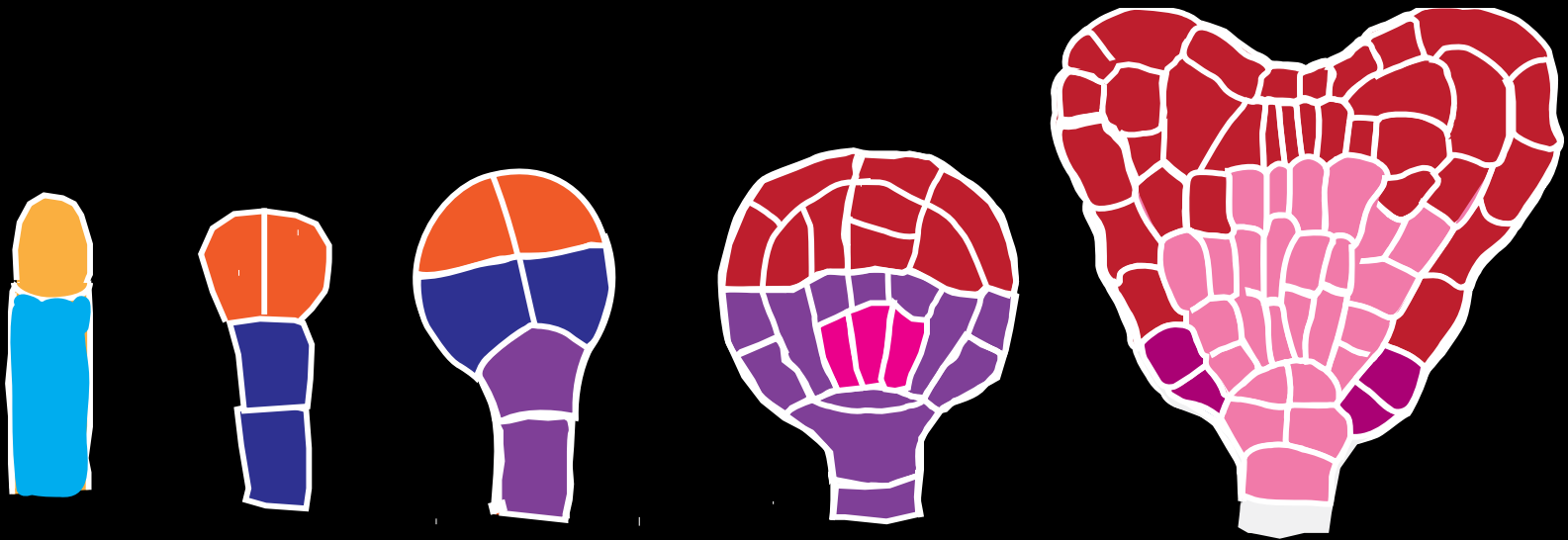
The diagram illustrates the 3-step purification process. A blue 10-ml serological pipette is shown with a 1-ml pipette tip inserted into its stem. The pipette is positioned over a black rectangular magnet. A green arrow labeled '2) Dissociation' points to the pipette. A green arrow labeled '3) Purification' points to the pipette tip. The pipette tip is shown dispensing a drop of liquid labeled 'Unbound nuclei and debris'. The pipette is labeled '10-ml serological pipette' and '1-ml pipette tip'. The magnet is labeled 'Magnet'. The liquid being dispensed is labeled 'Unbound nuclei and debris'. The liquid remaining in the pipette is labeled 'Captured beads and nuclei'. The liquid being added to the pipette is labeled 'Mixture of beads and nuclei'.

Workpackage D (Scheres Group): Specification of shoot and root poles



Scheres Group: Specification of shoot and root poles

Protein expression map of PLTs suggests distinct apical and basal codes



2,4



1,2,4,7



1,2,4,5,7



2,4,5,7



1,2,3,4,5,7



1,2,3,4,7



3,5,7



1,2,3,4



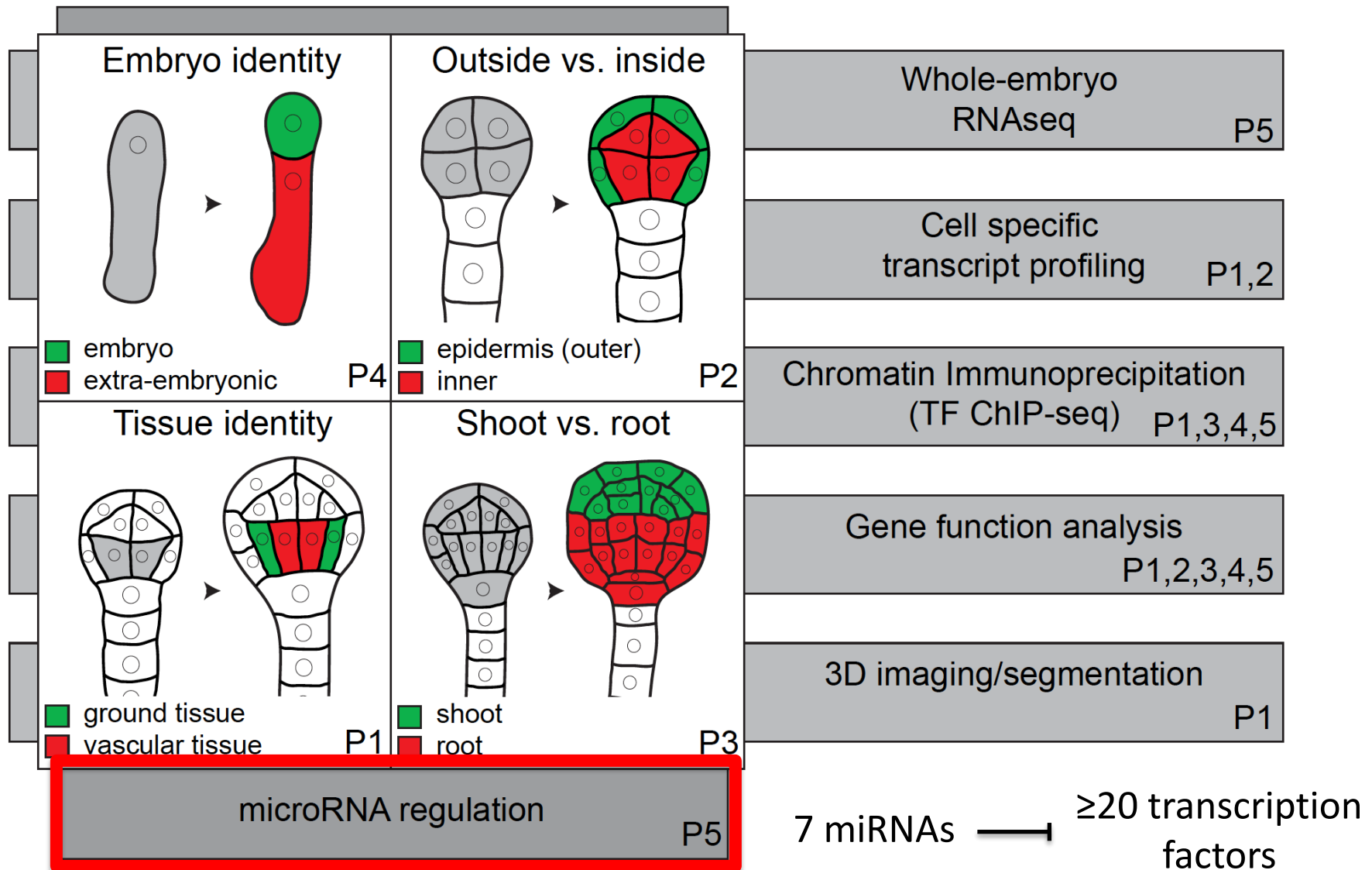
1,2,3,4,5

Viola Willemsen

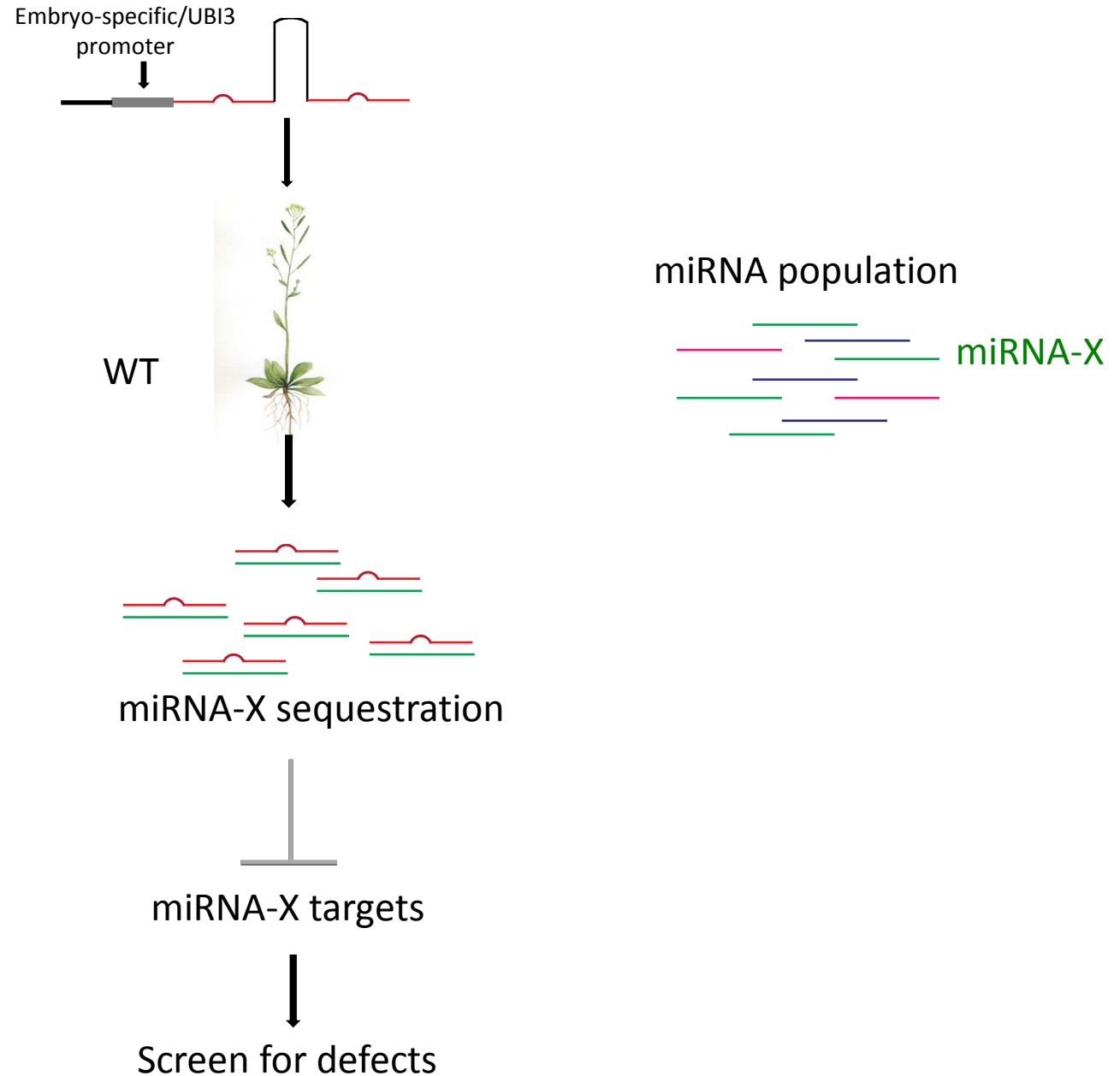
Under way:

- (1) genetic analysis of significance apical code, also including *ANT* (Serena Perilli)
- (2) Determine early embryo expression of *ANT* to complete 'code description'
- (3) Upstream regulators *PLT2* and *PLT4* and *PLT2-PLT4* autoregulation in basal code

Workpackage E (Nordine Group): MicroRNA-mediated control of early embryonic patterning



miRNA target mimic approach to specifically inhibit seven selected miRNAs



Knock-down of specific miRNAs results in distinct morphological defects

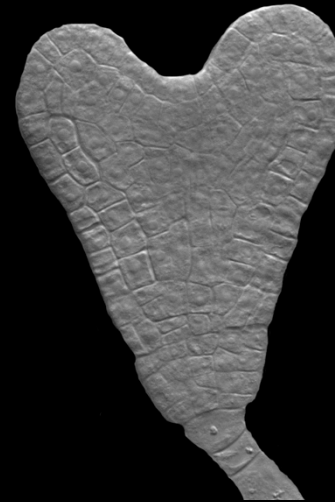
Heart stage



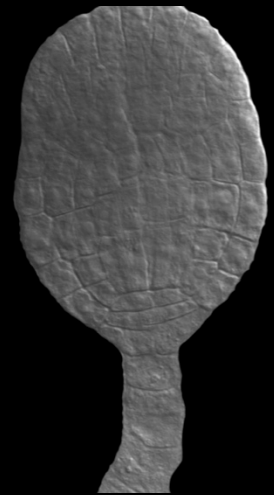
Wild-type



Negative
transgenic control



miR156
knock-down



miR160
knock-down

Globular stage



Wild-type



Negative
transgenic control



miR166
knock-down



miR319
knock-down


Plant Embryomics Central: A Platform for Collaborative Research on Plant Embryo Genomics

www.plantembryomics.org




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Join the Discussion

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Euro-PEC Questions and Answers

Questions Unanswered Tags Users Ask a Question

Does anyone know of some good protodermal markers?

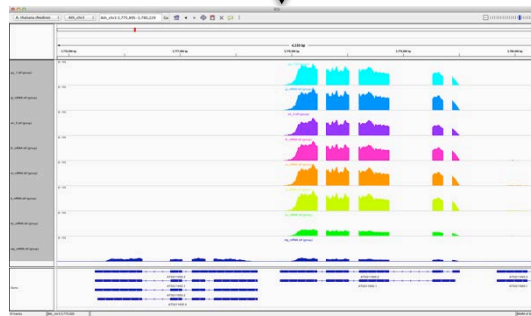
asked 2 minutes ago by michael.nodine (140 points)

0 votes

1 Answer

answered May 6 by michael.nodine (180 points)

Yes, pATM, 1 and pPDF2 are good markers but are also expressed in the suspensor



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Vienna Biocenter BioComp Group



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