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Breeding high magnesium *Brassicac*s: Investigating an EMS-background hyper-accumulator

Thomas D Alcock
University of Nottingham

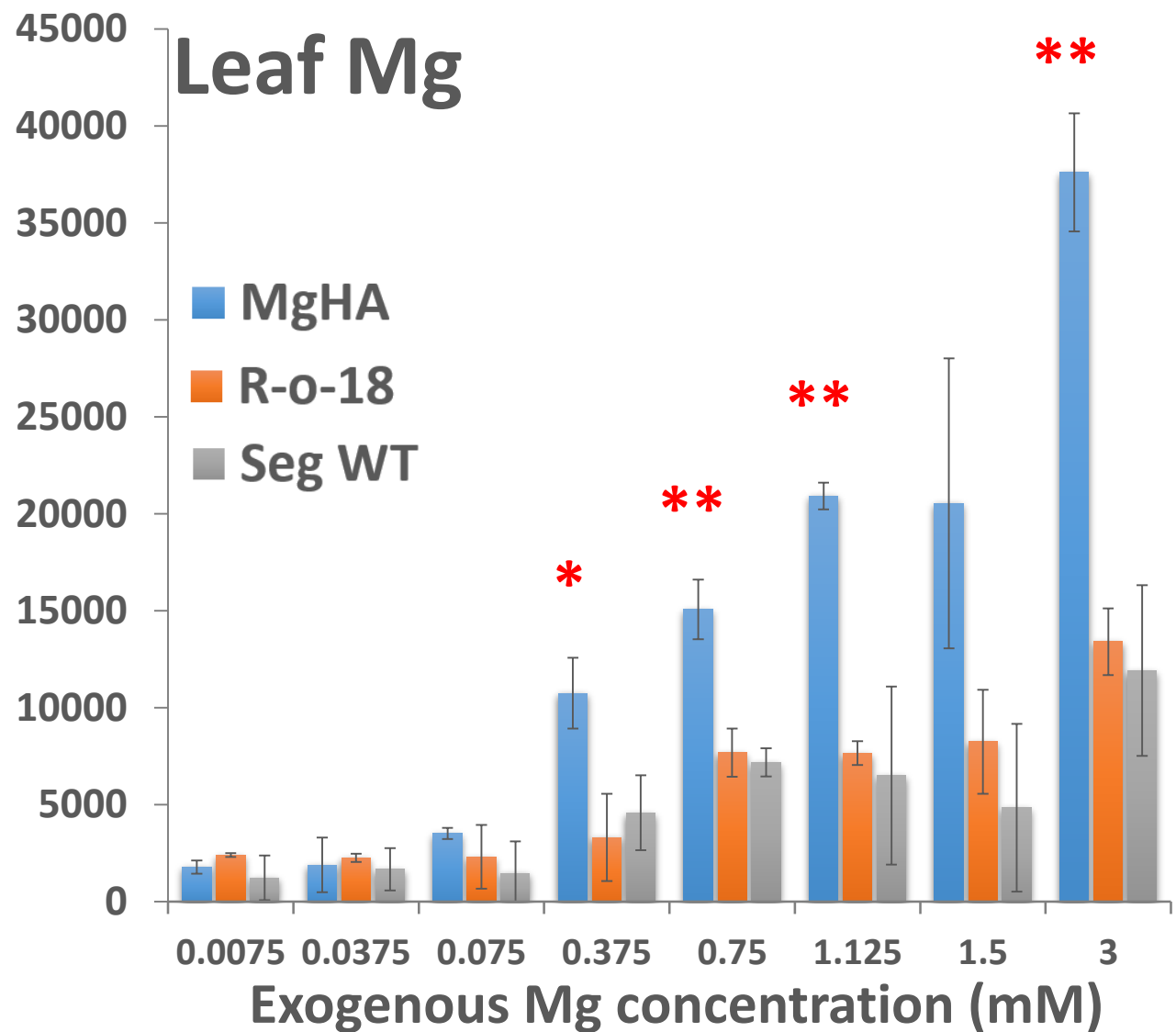
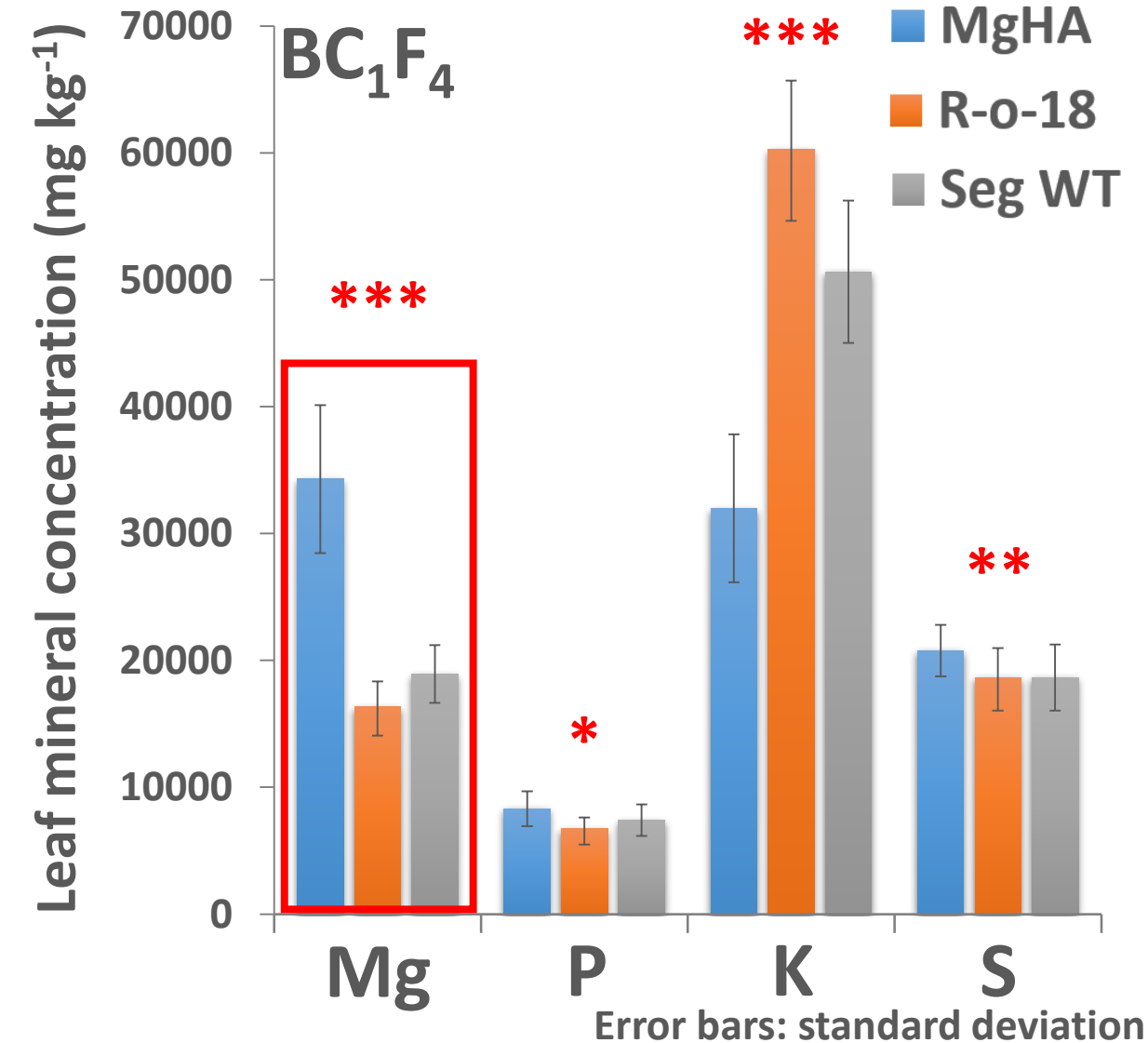


Magnesium in human health

- Crucial for nucleic acid and protein synthesis, muscle contraction, and maintaining heart's rhythm
- Long term deficiencies linked to cardiovascular disease, diabetes, hypertension and seizures
- Deficiency risk greatest in higher income countries
 - UK and USA adults: - 9 % consume less than LRNI
 - 58 % consume less than RNI
- Crop biofortification could reduce deficiency risk for millions

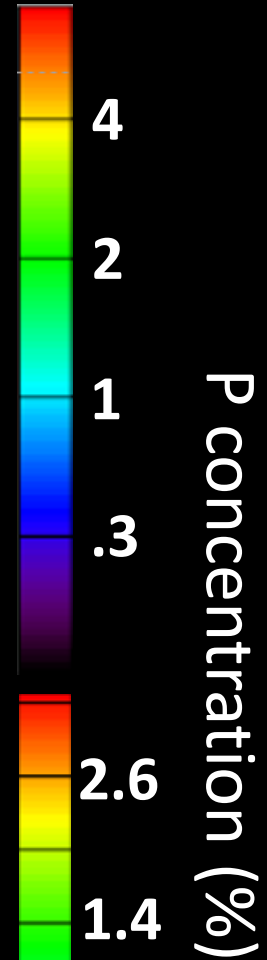
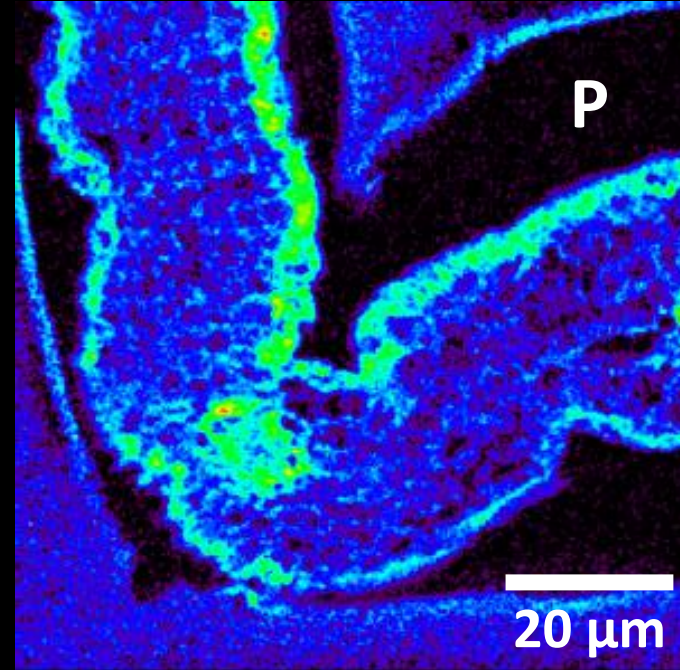
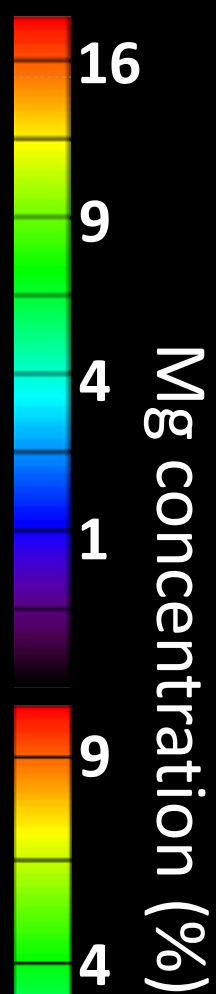
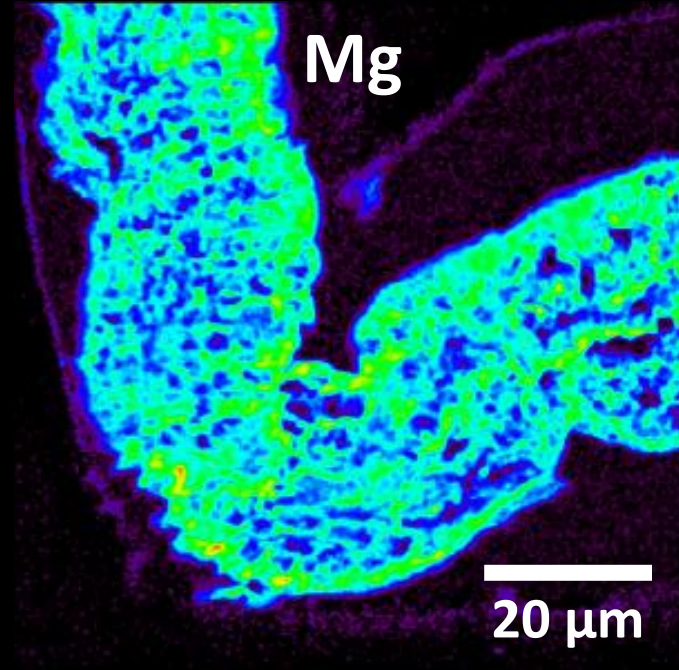


The Magnesium Hyper-Accumulator

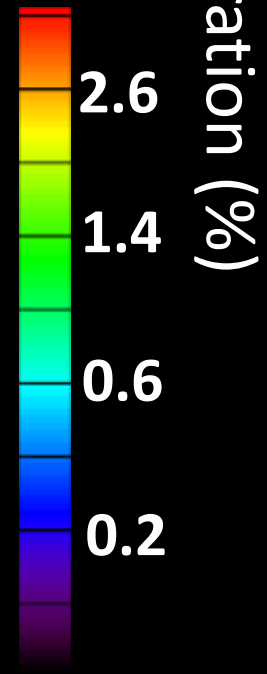
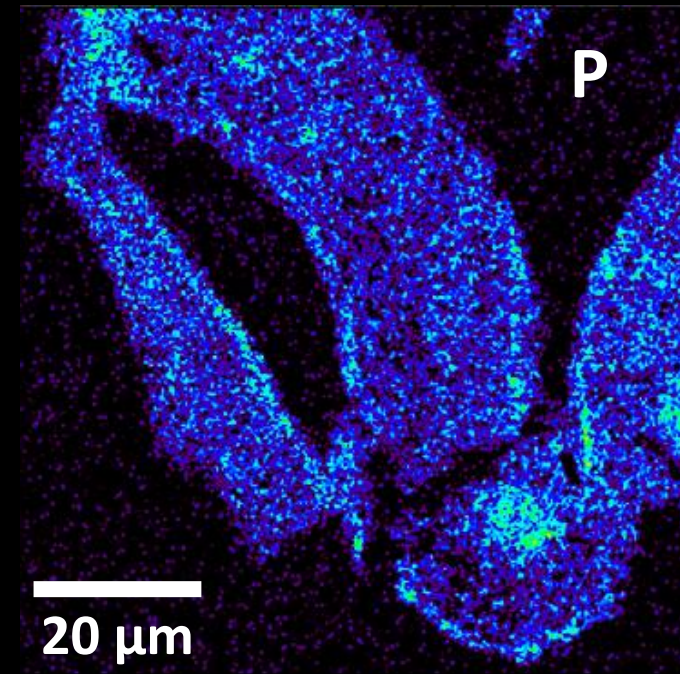
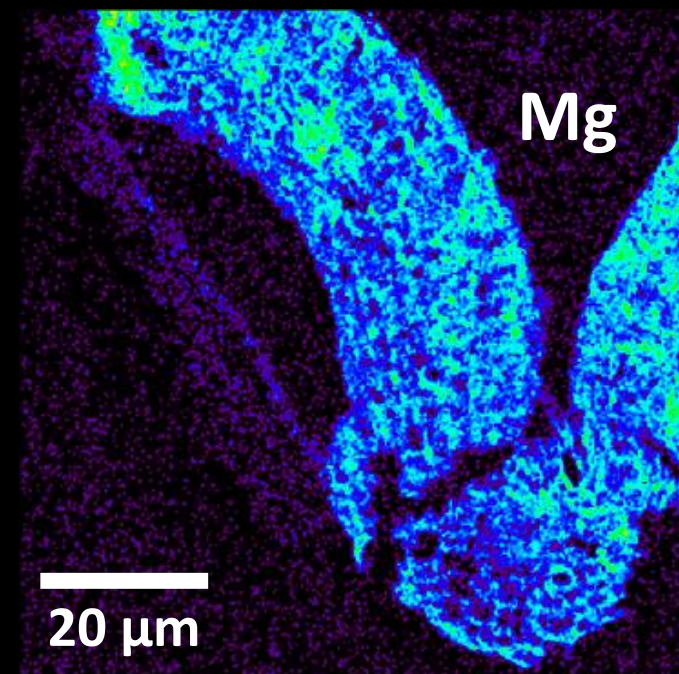


Trait identified in EMS population ICP-MS screen

Mg HA

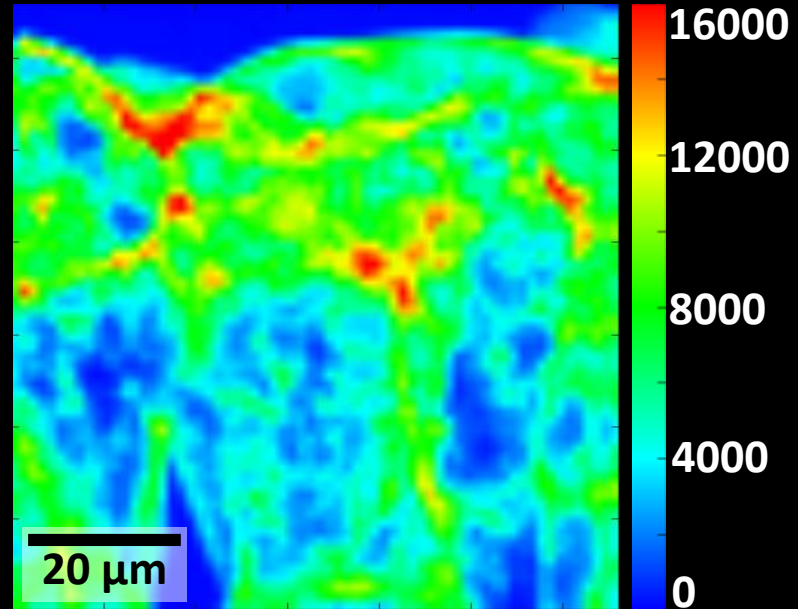
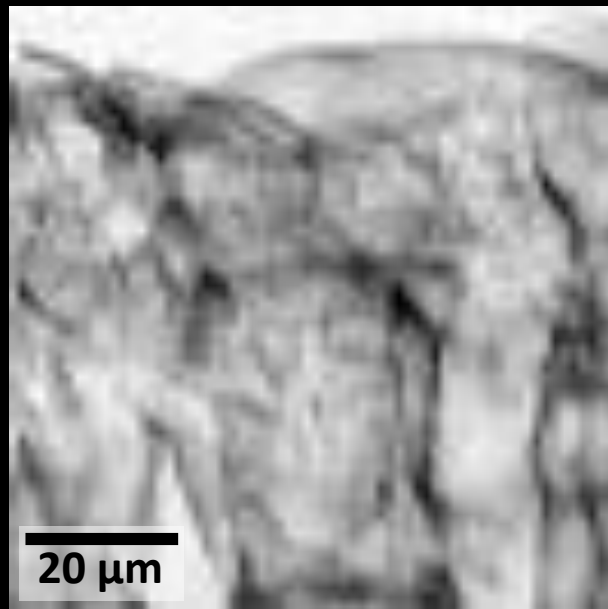


Seg WT

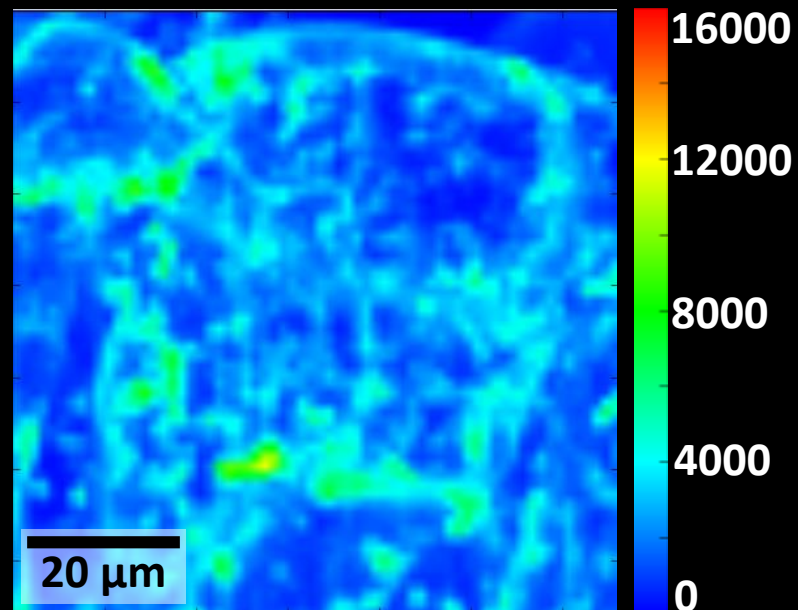
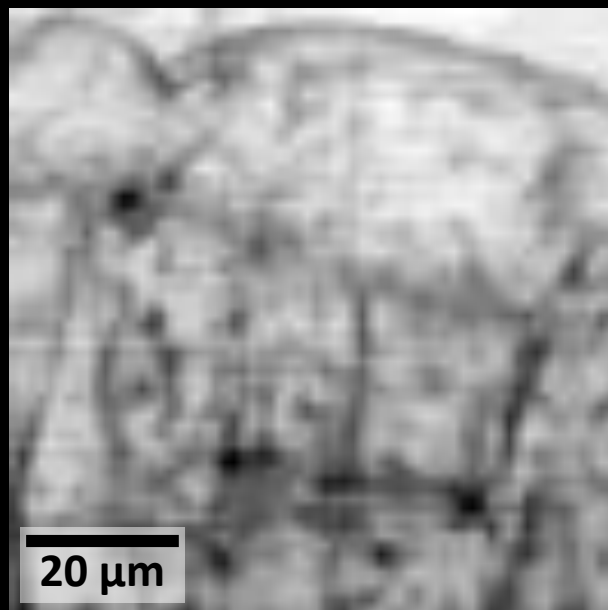


1000 x 1000 micron

Mg HA



SegWT

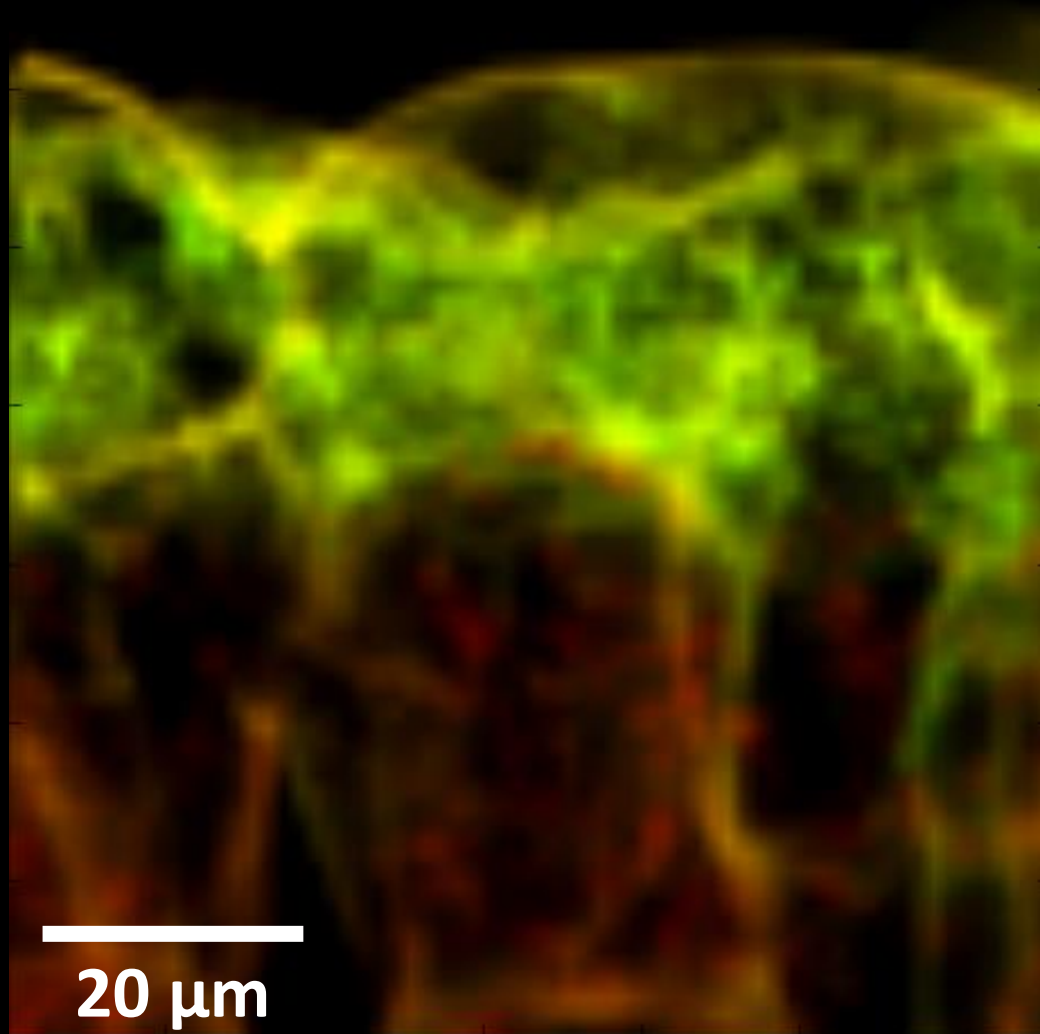


X-ray Image

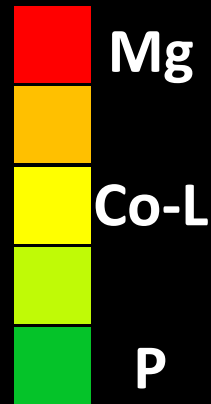
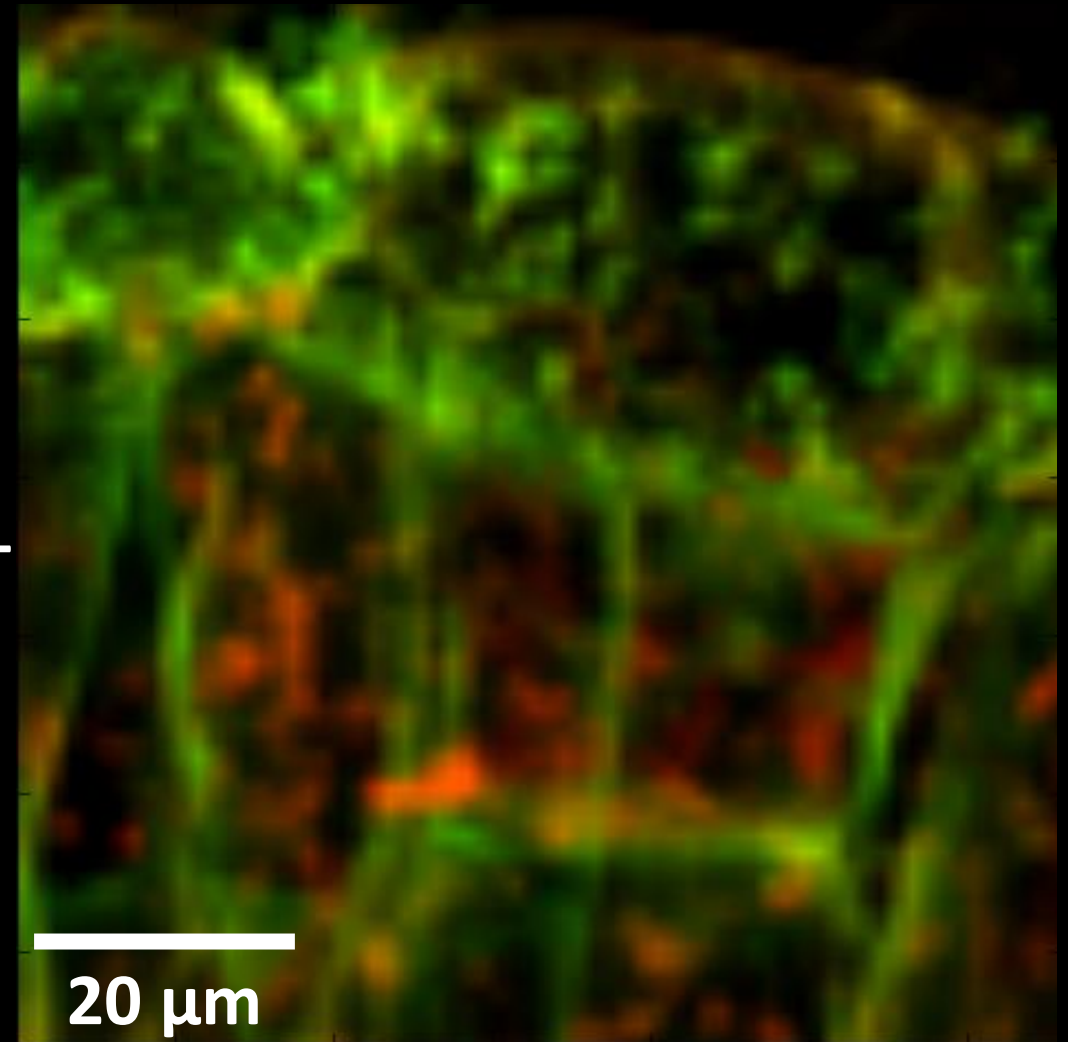
Mg (counts/pixel)

80 x 80 micron – 1.2 micron resolution

Mg hyper-accumulator



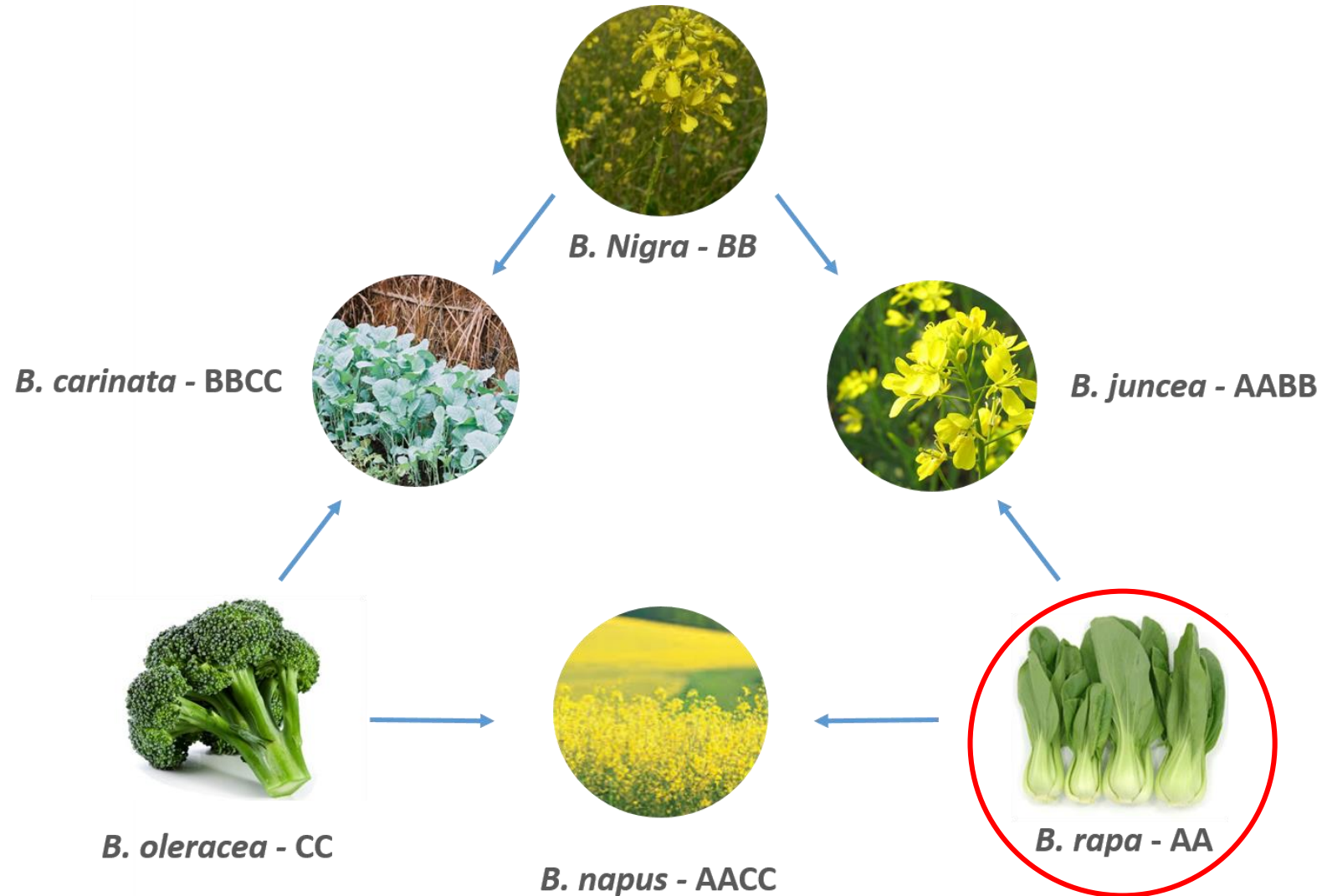
Segregating wild-type



Upper epidermis and mesophyll Mg/P co-localisation

80 x 80 micron – 1.2 micron resolution

Breeding high magnesium *Brassicac*s



Candidate genes identified through bulk-segregant analysis



Acknowledgments

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Scott Young



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Katerina Vogel-Mikuš

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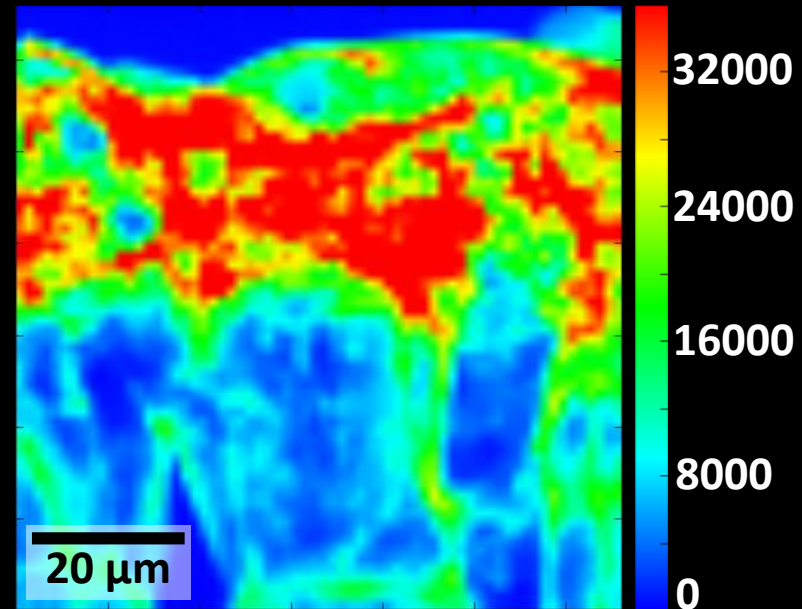
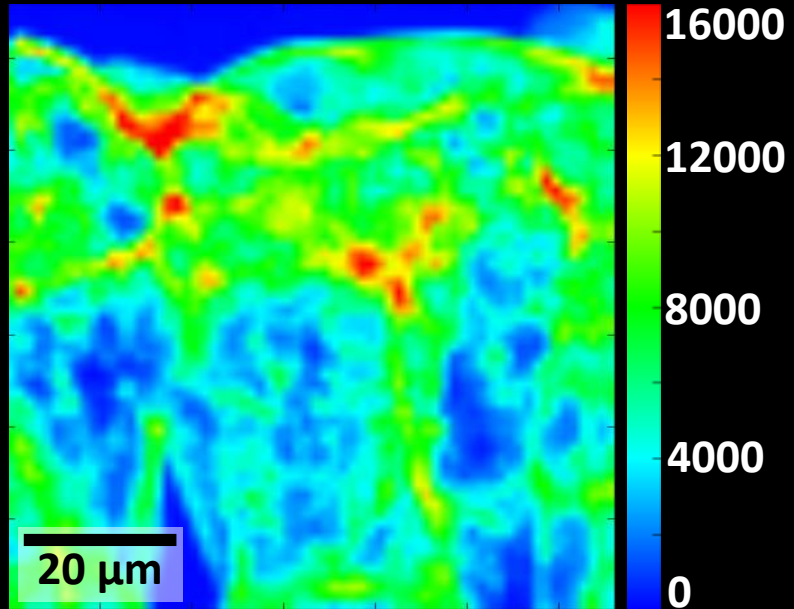
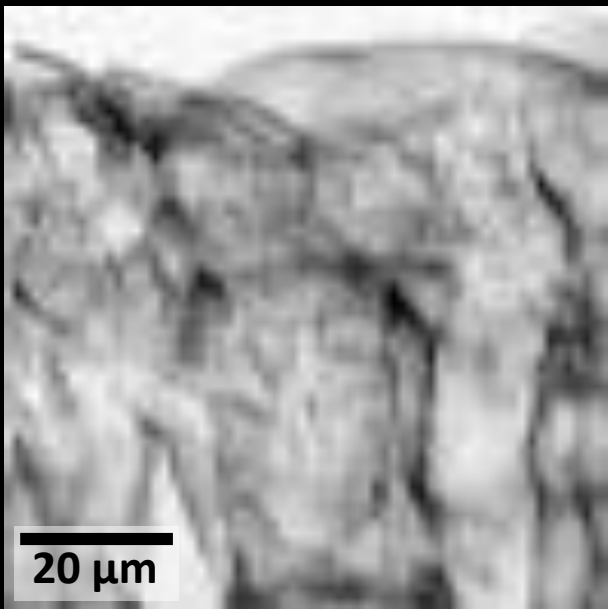
Philip White
Konrad Neugebauer



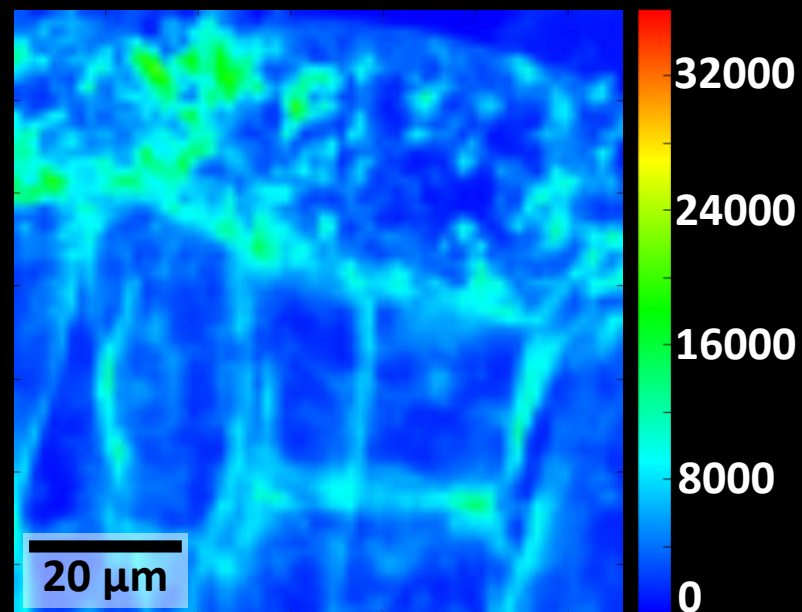
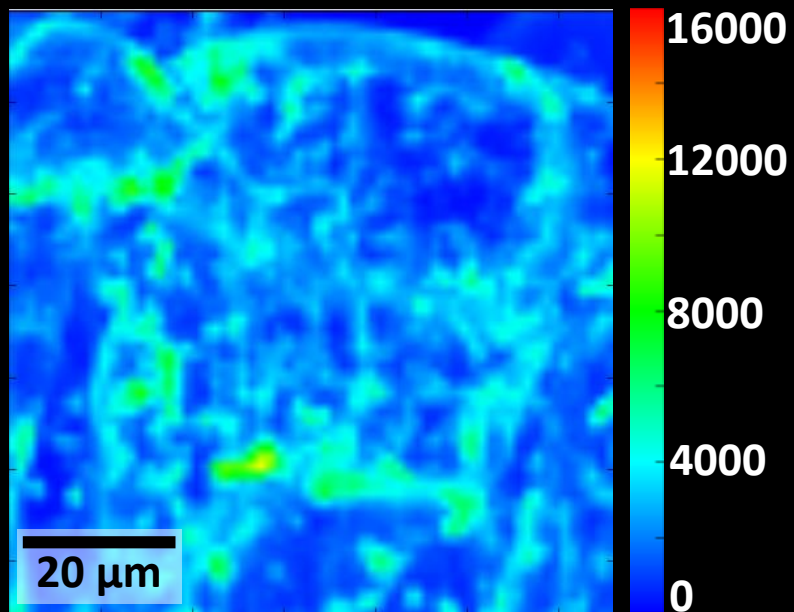
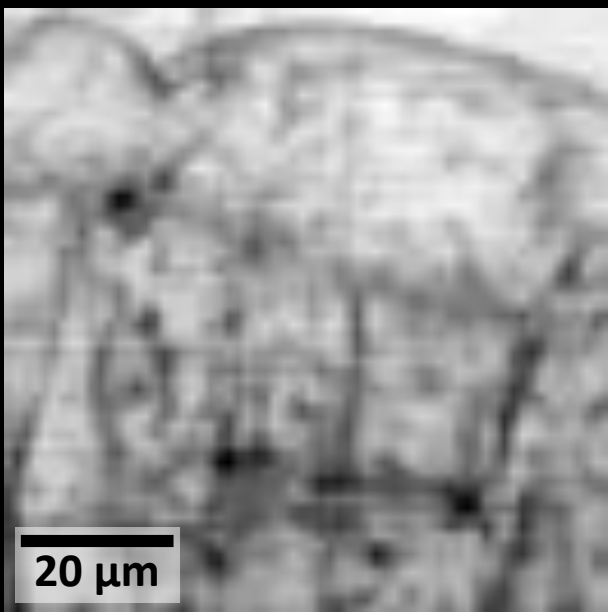
Alessandra Gianoncelli
Matteo Altissimo



Mg HA



SegWT



X-ray Image

Mg (counts/pixel)

P (counts/pixel)

80 x 80 micron – 1.2 micron resolution