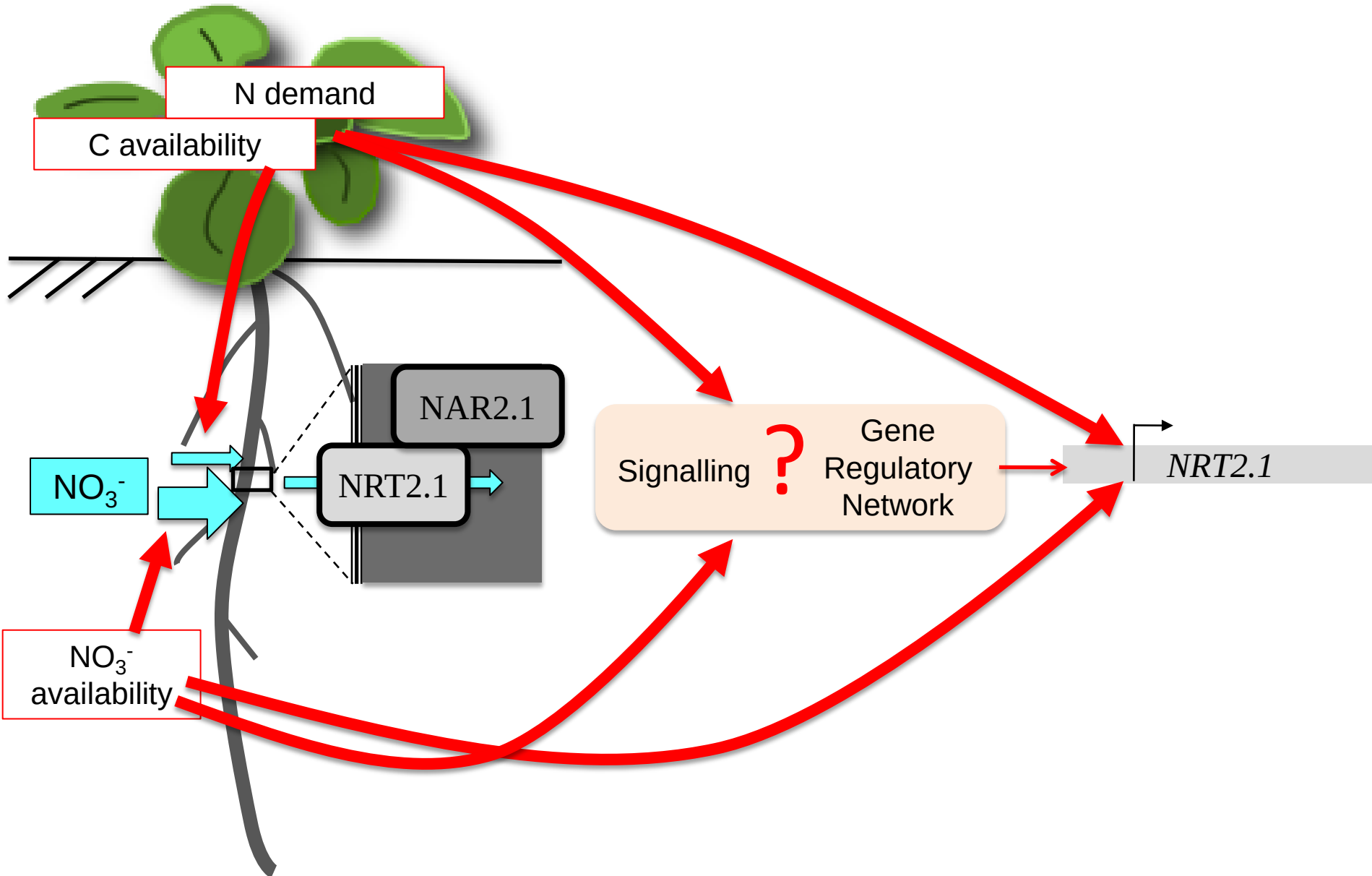


MODELLING GENE REGULATORY NETWORK CONTROLLING NITRATE ACQUISITION

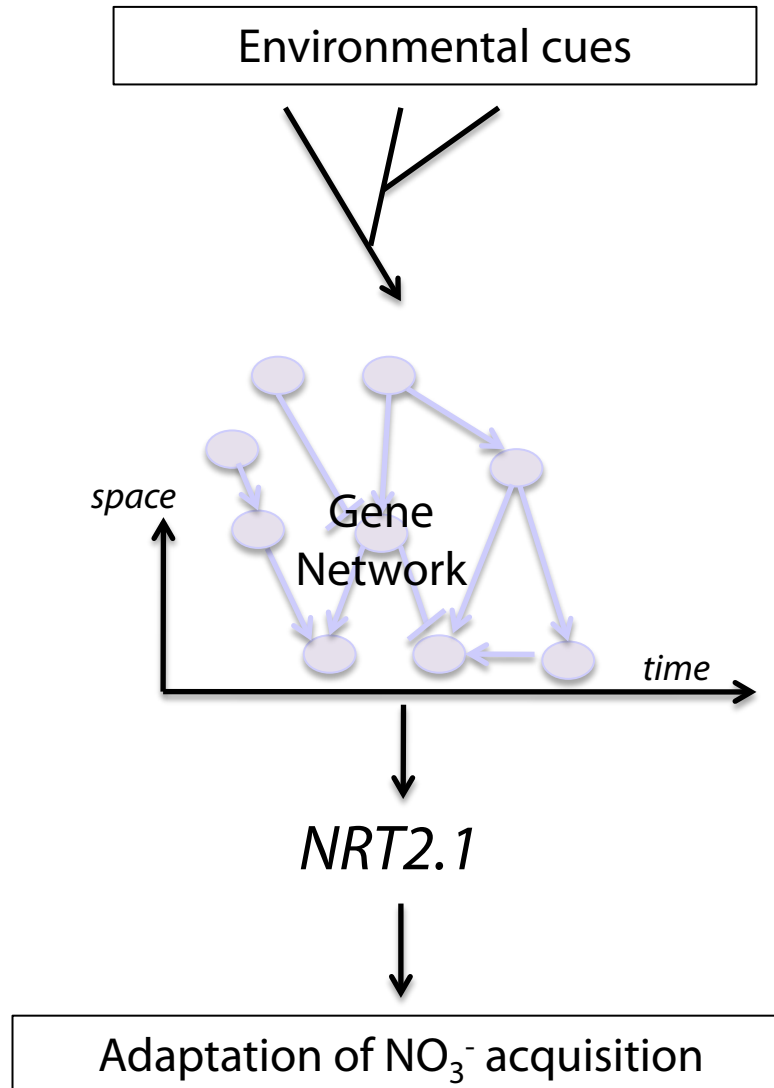
Sandrine Ruffel
CR2 – July 2011
Integration Group



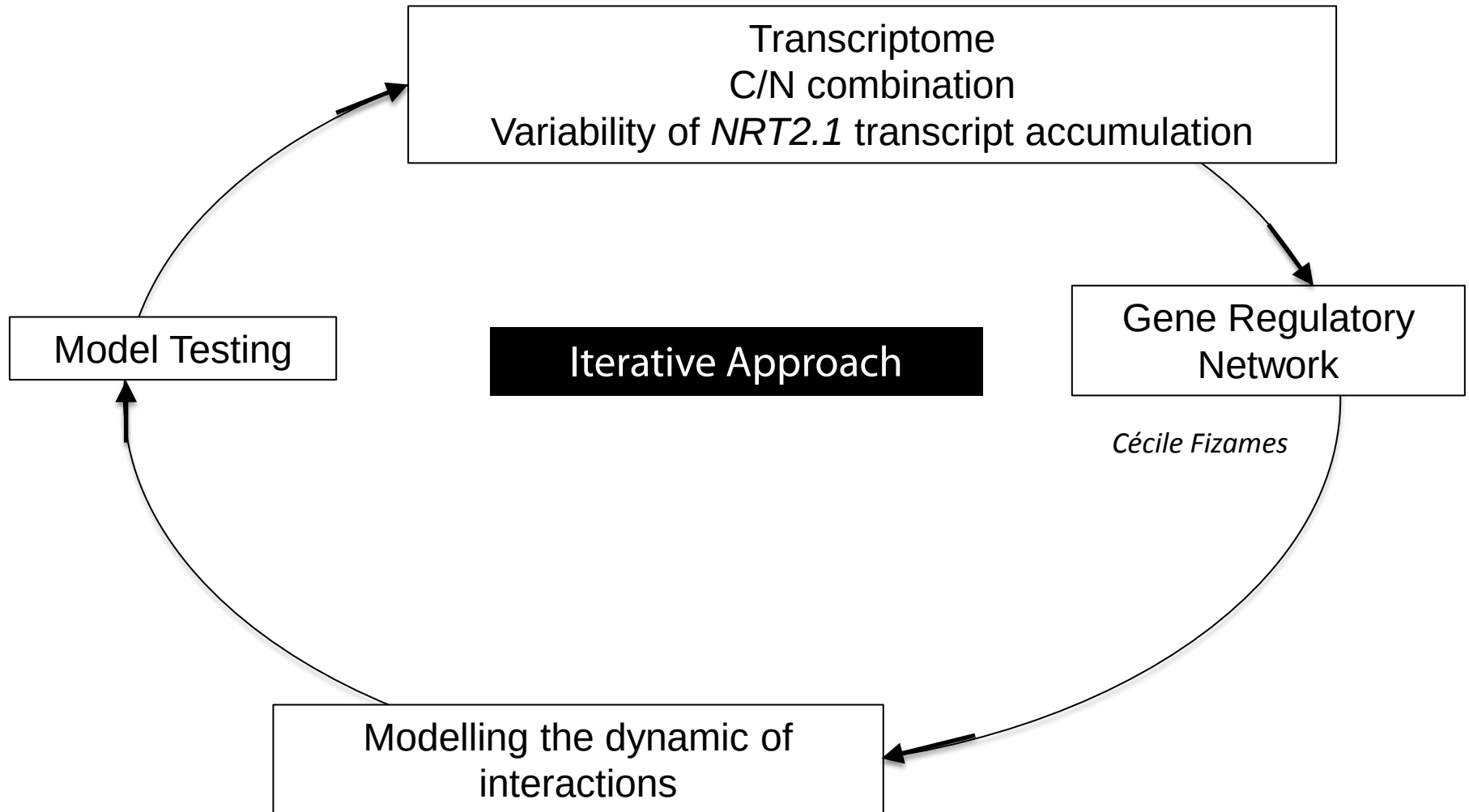
NO₃⁻ uptake as well as expression of genes involved in this function are targets for the same regulation



Objective

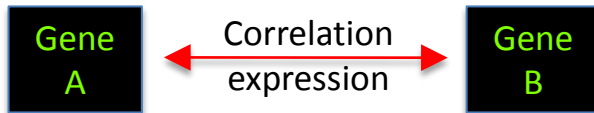


ANR International Project: ModelN (Coordination: L. Lejay)
-University of Santiago Chili : Plant Systems Biology lab
-University of Montpellier 2 : Theoretical physic



Gene Regulatory Network Building

Integration of Genomic Data

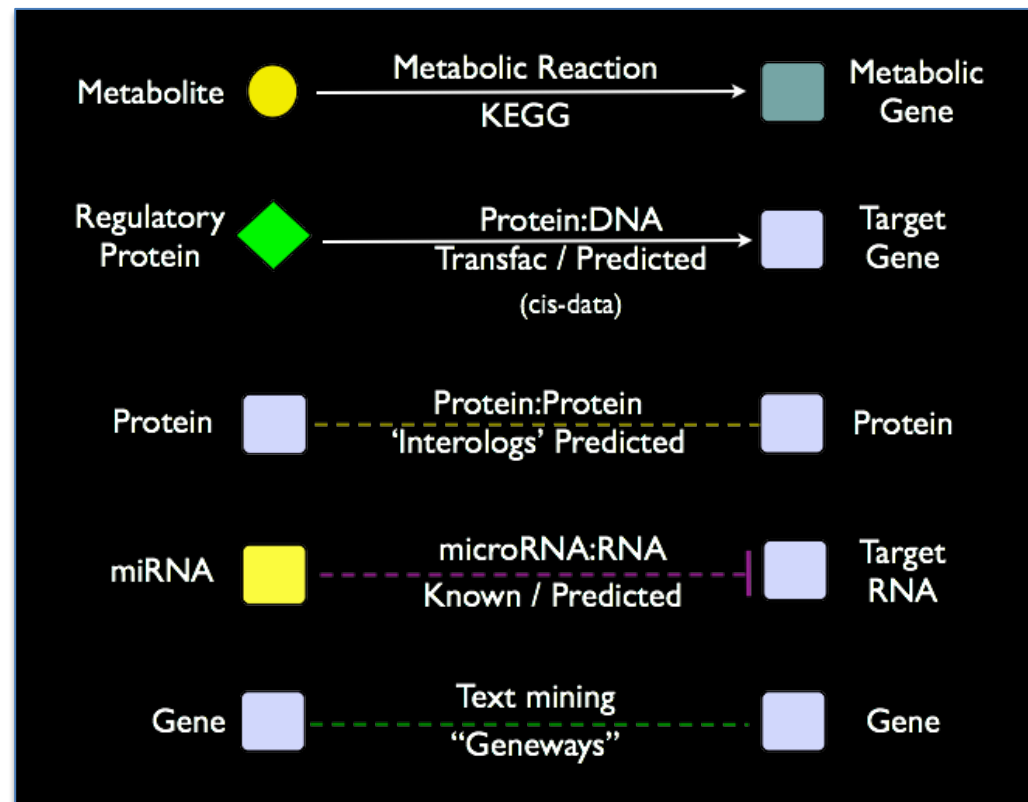


Transcriptome

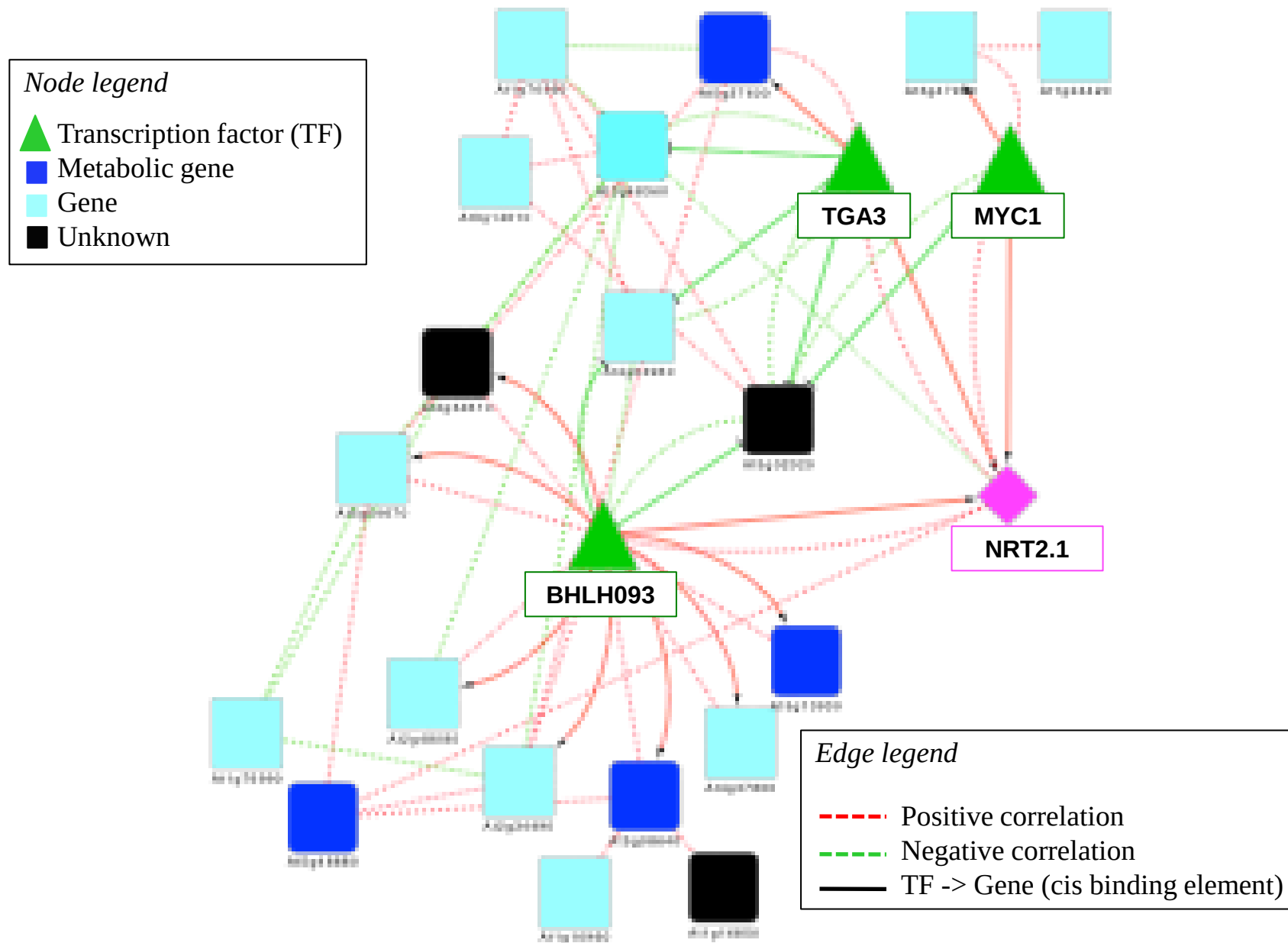


Variability of gene expression
(30.000)

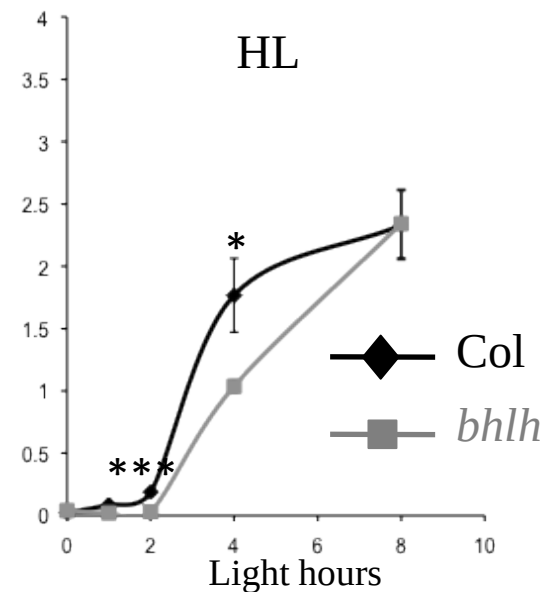
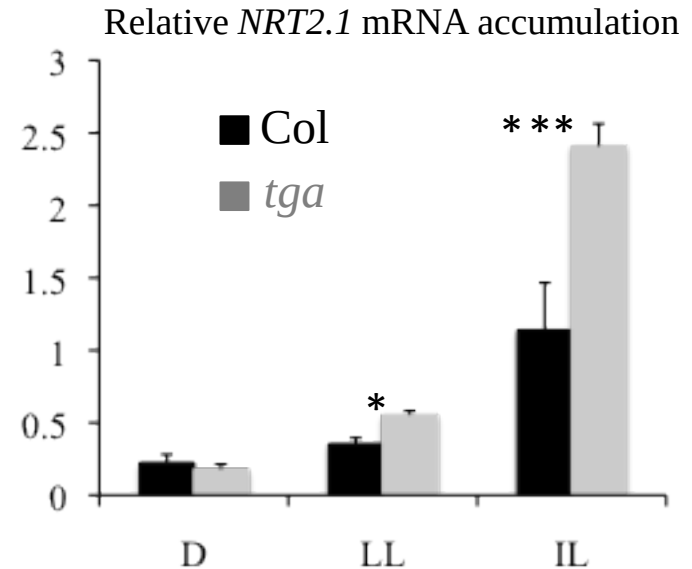
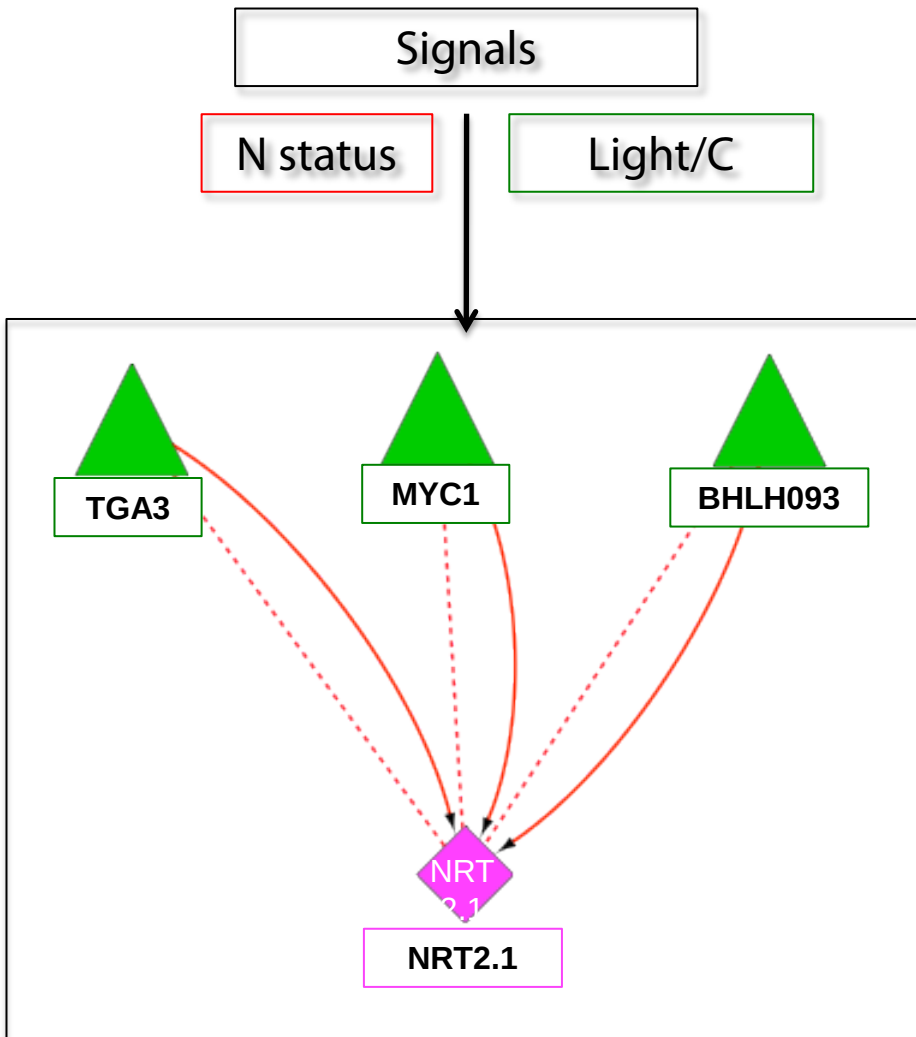
Interaction data / Genome



Gene Regulatory Network centered on *NRT2.1*



Network validation: transcription factors are the targets



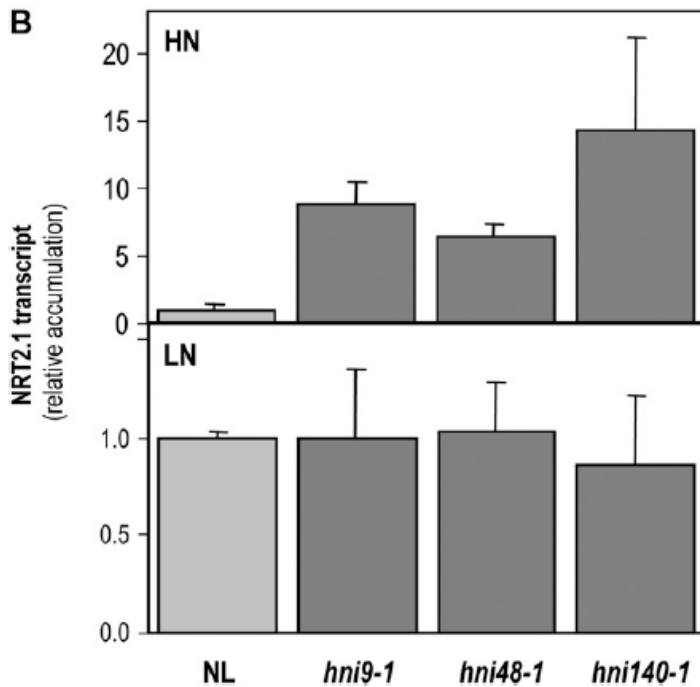
Jonathan Przybyla-Toscano

Network building requires others approaches

1/ Genetic analysis

Screening → Identification of mutants altered for *NRT2.1* response on high N medium

Marc Lepetit Project



Girin et al., 2010

✓ *hni9* cloning
IWS1, Interacting with *Spt6*
RNA Polymerase II Complex
Widiez et al., 2011

Chromatin modifications

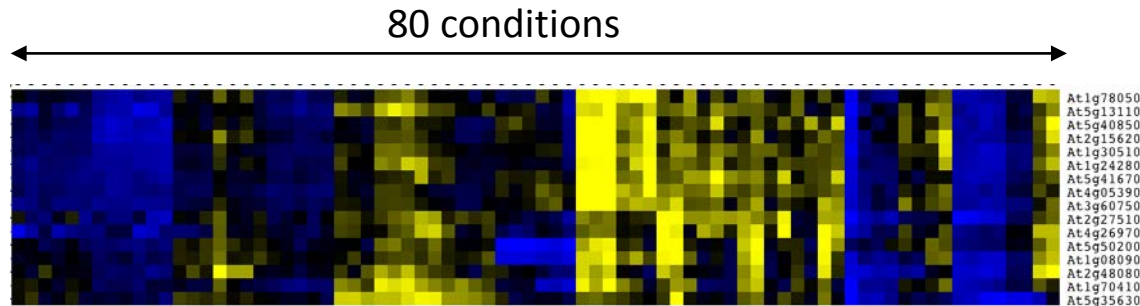
✓ *hni48* and *hni140* cloning

New Regulators ?

Network building requires others approaches

1/ Genetic analysis

2/ Analysis of promoter regions in a larger system including *NRT2.1*

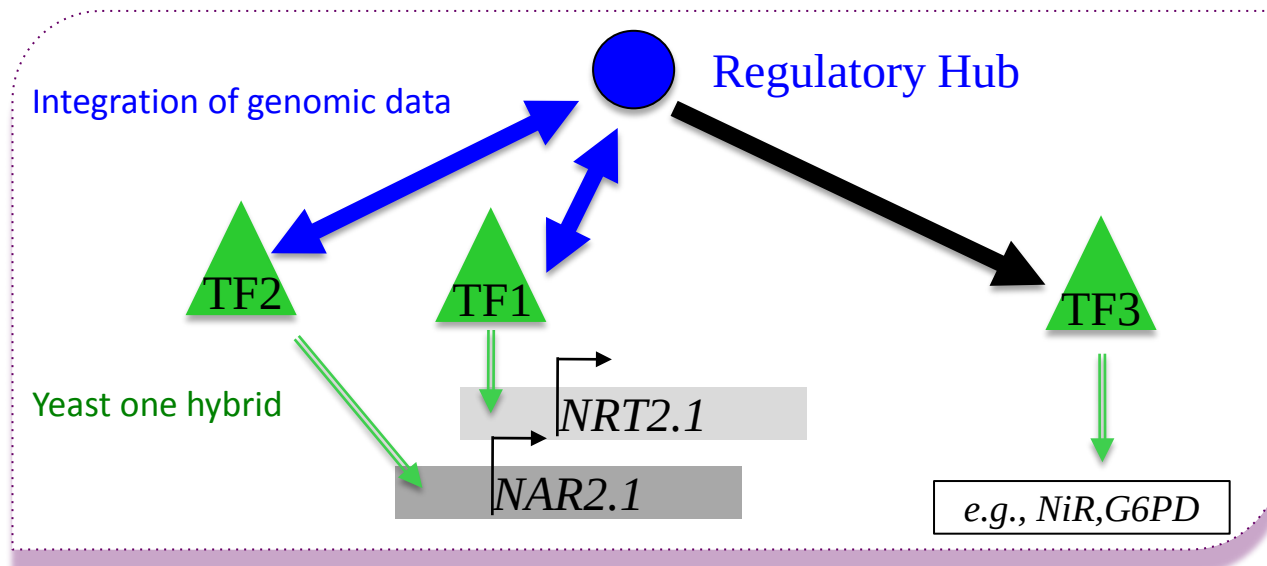


NRT2.1 and 16 genes positively co-regulated:

-*NRT3.1*

- NO_3^- assimilation (e.g., *NiR*)

-C metabolism (e.g., *G6PD*)



Conclusion

