

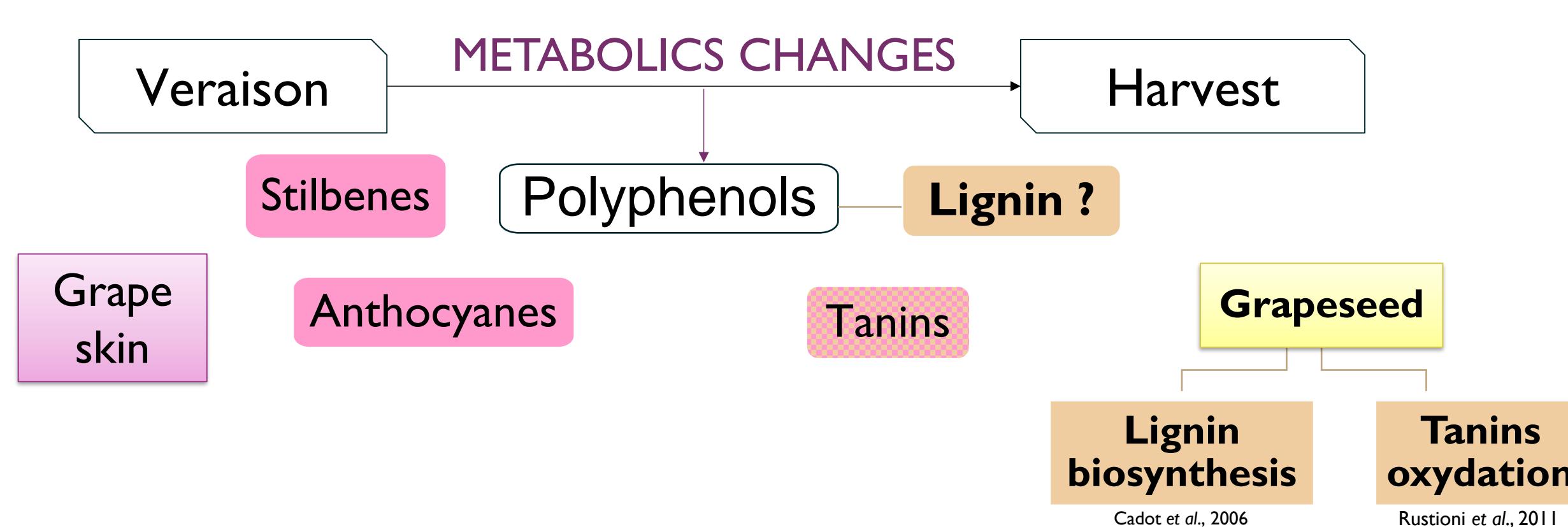
Which lignin is accumulated in grapeseed during maturation?

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INTRODUCTION

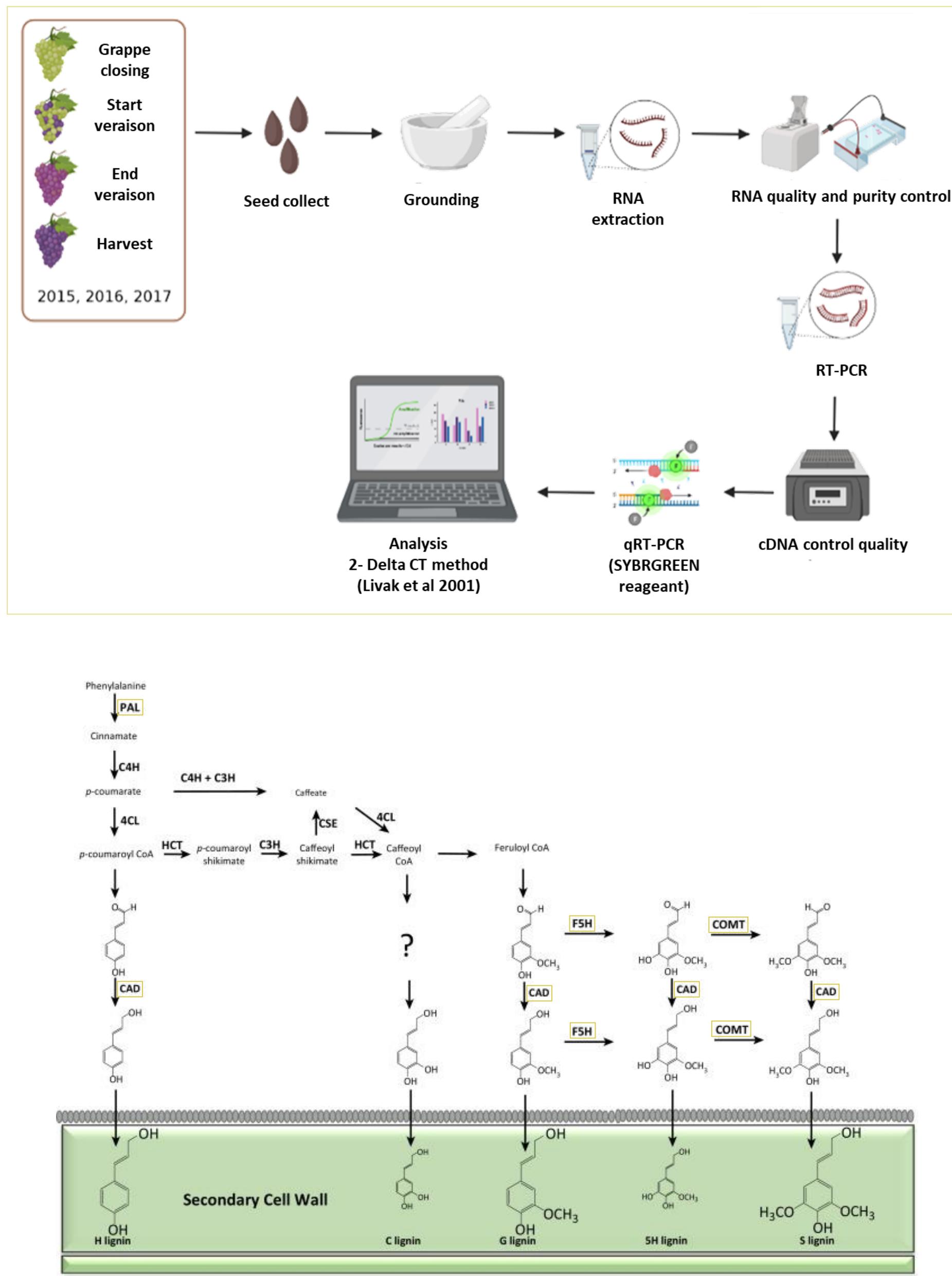
Usually the winemaker consider polyphenols from the grape berry as an actor of the wine quality. There are frequently consider as a marker of grape maturity. It is commonly known that winemaker consider tannins and anthocyanins as main polyphenol actors for winemaking practices and wine quality. Here we will focus on the characterisation of lignins in grape seeds. Previous studies suggest that the seed is lignified, which could explain the change in colour of the seed when it reaches maturity and thus provide a reliable indicator for describing the maturity stage in the seed.



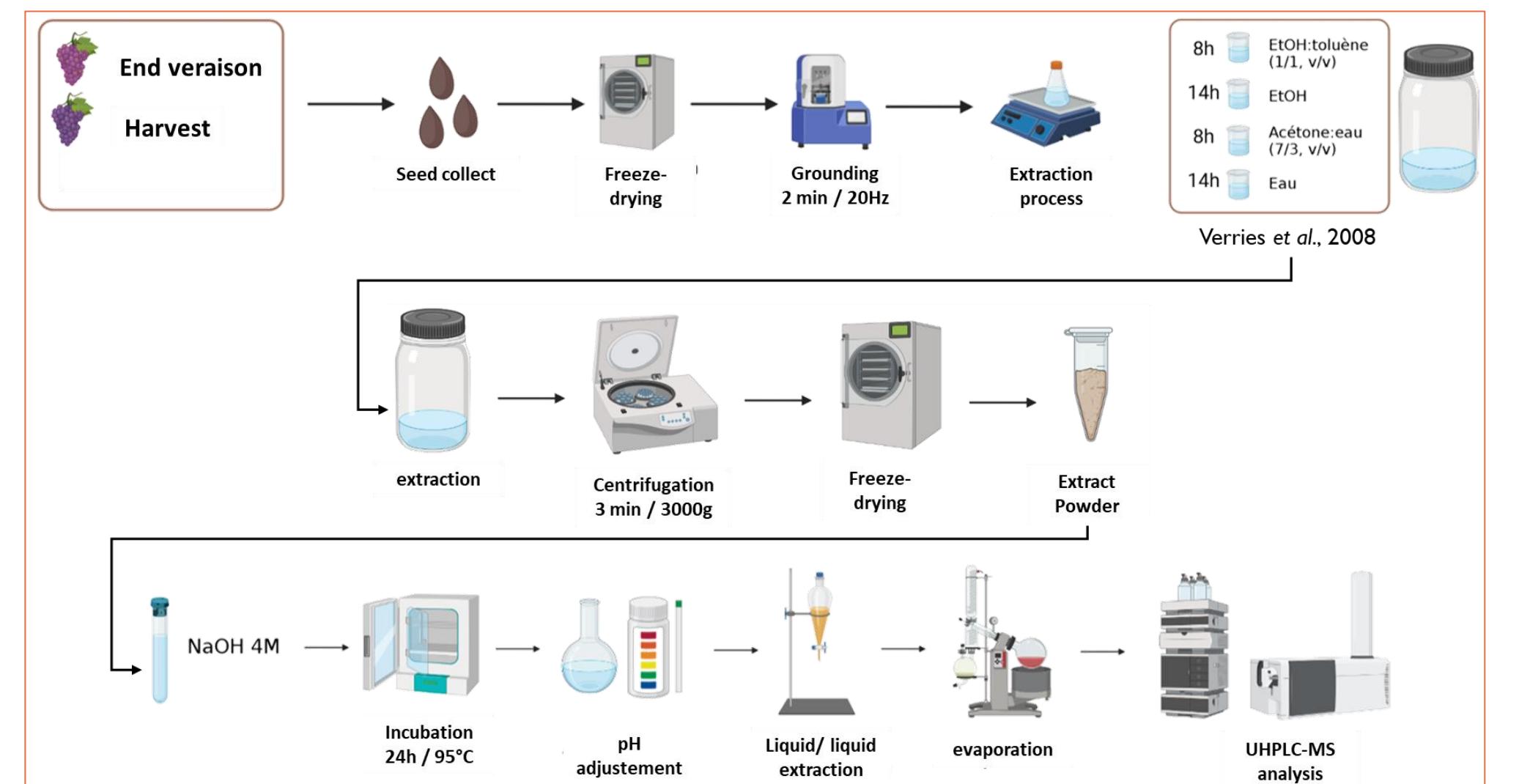
- Does the lignin biosynthesis pathway is working during grapeseed maturation?
- Which pattern of lignin monomers is retrieve in grapeseed ?

METHODS

Lignin biosynthesis pathway study by RT-qPCR

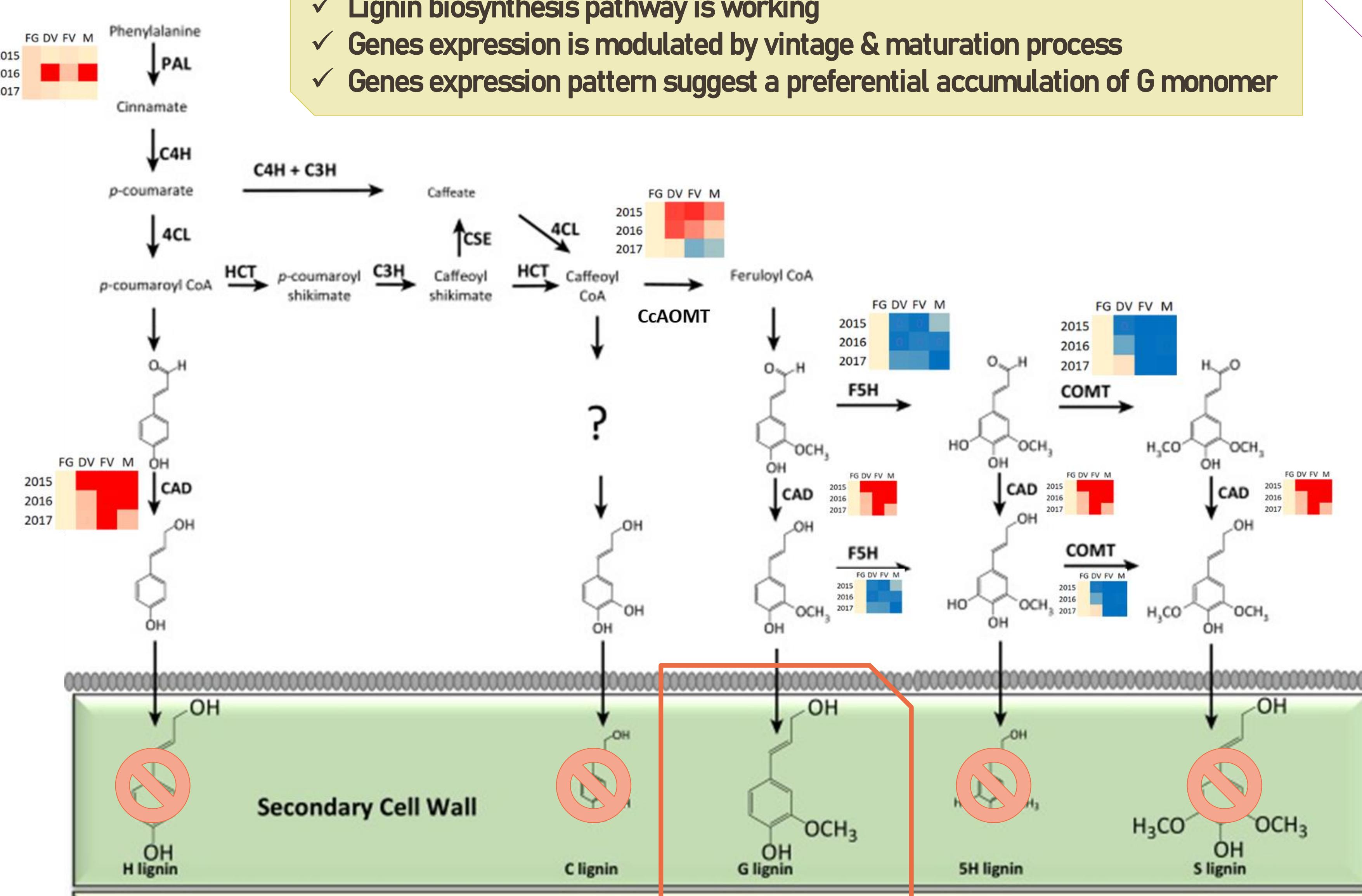


Identification of lignin monomer by chemical study

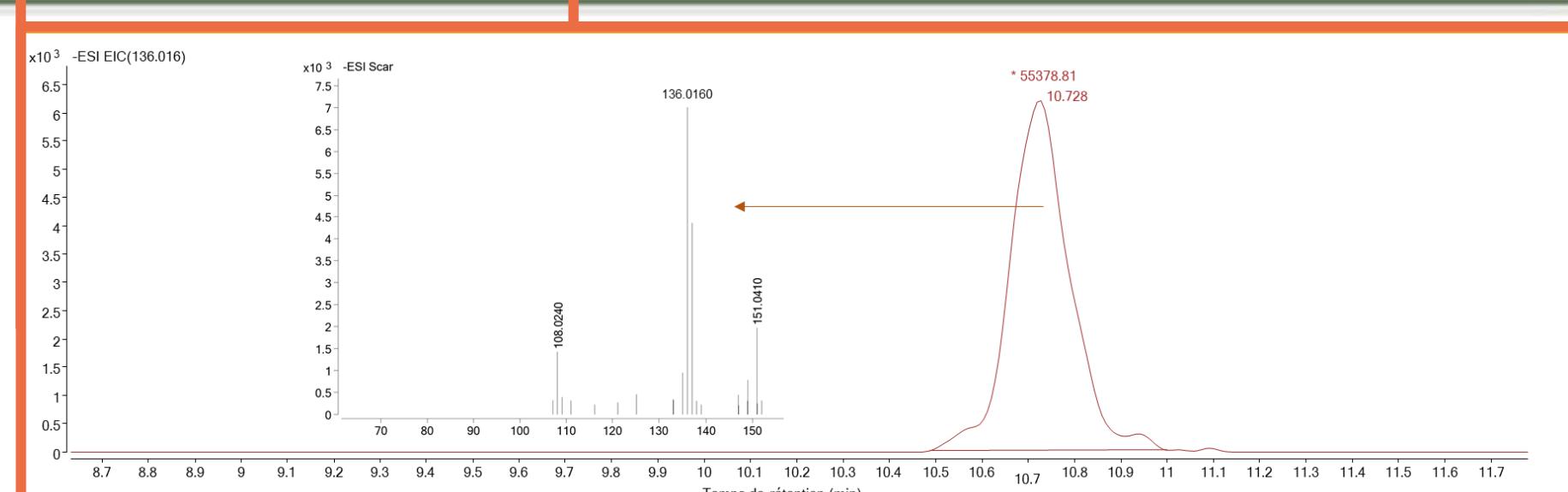


RESULTS

- ✓ Lignin biosynthesis pathway is working
- ✓ Genes expression is modulated by vintage & maturation process
- ✓ Genes expression pattern suggest a preferential accumulation of G monomer



- ✓ Lignin detected
- ✓ S monomer undetected
- ✓ G MONOMER IDENTIFIED



CONCLUSION

This study was the first to demonstrate the presence of lignin in grape seeds. As a reminder, the initial issues were (i) whether the biosynthesis pathway is functional in the seed during ripening, which was confirmed by biochemical analysis, and (ii) whether there are monomers preferentially formed in the seed. On this point, the results obtained from the chemical analysis corroborate those obtained from the biochemical analysis, since gene expression implied the synthesis of G units to the detriment of S units, and no G units could be detected. Further studies are required to extend these results. Enzymatic analysis has to be done, which may or may not validate the hypothesis made concerning the biosynthesis of the F5H and COMT enzymes. Biochemical analysis has shown a significant vintage effect on the biosynthesis pathway, and it would therefore be interesting to study its

Bibliography:
Cadot, Y., et al. « Anatomical, Histological, and Histochemical Changes in Grape Seeds from *Vitis Vinifera* L Cv Cabernet Franc during Fruit Development ». *Journal of Agricultural and Food Chemistry*, vol. 54, no 24, novembre 2006, p. 9206 15. Jourdes, M., et al. « Plant Cell Walls Are Enfeebled When Attempting to Preserve Native Lignin Configuration with Poly-p-Hydroxycinnamaldehydes: Evolutionary Implications ». *Phytochemistry*, vol. 68, no 14, juillet 2007, p. 1932 56; Livak, K J., et al. « Analysis of Relative Gene Expression Data Using Real-Time Quantitative PCR and the $2^{-\Delta\Delta CT}$ Method ». *Methods*, vol. 25, no 4, décembre 2001, p. 402 08. ; Rustioni, L., et al. *Maturité phénolique du pépin : bases chimiques et développement d'un nouvel indice*. 7e édition. Enoforum, 2011; Verries, C., et al. « Validation of an Extraction Method on Whole Pericarp of Grape Berry (*Vitis Vinifera* L. Cv. Shiraz) to Study Biochemical and

Molecular Aspects of Flavan-3-Ol Synthesis during Berry Development ». Journal of Agriculture and Food Chemistry, 2003, 51(23), 6833-6840