

Proposition d'un sujet de stage Master M2 ADAM 2016-2017

Titre	The role of oxygen, ethylene, NO and Hemoglobin as multi-signaling mechanism controlling fruit ripening
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Résumé du sujet (maximum de 20 lignes)

The transition from unripe-to-ripe fruit represents a developmental shift that is characterized in tomato, a climacteric type of fruit, by autocatalytic production of the plant hormone ethylene and a sharp increase in respiration. However, the link between the rise in respiration and the burst of ethylene production remains poorly understood. The proposed research project aims to address the role of hypoxia and oxygen sensing in controlling the ripening process. The candidate will use a new non-destructive device to characterize the evolution of O₂ levels in different parts of the fruit tissues. This will be performed both in control wild type and in a series of ripening mutants including *rin*, *nor* and *nr* at different stages of fruit ripening. Given that O₂ sensing and response is known to be mediated by Ethylene Response Factors and that these transcription factors are also involved in the ripening process, the proposed project seeks to uncover the specific role of ERFs in linking the oxygen status to the initiation of fruit ripening. Furthermore, since oxygen trapping by Hemoglobin (Hb) has been shown to facilitate NO scavenging and that NO can act as a novel signal molecule to modulate fruit ripening, the aim of the present project is to decipher the complex regulation mechanism involving, Oxygen, NO, Hb and ERFs during the ripening process. The project will use dedicated and unique genetic resources generated in house, advanced transcriptomic approaches and a new technology for assessing in vivo oxygen levels.

