



GOLLUM [FeFe]-hydrogenase-like proteins are essential for plant development in normoxic conditions and modulate energy metabolism

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Résumé en anglais	[FeFe]-hydrogenase-like genes encode [Fe ₄ S ₄]-containing proteins that are ubiquitous in eukaryotic cells. In humans, iron-only hydrogenase-like protein 1 (IOP1) represses hypoxia inducible factor-1 α subunit (HIF1- α) at normal atmospheric partial O ₂ pressure (normoxia, 21 kPa O ₂). In yeasts, the nar1 mutant cannot grow at 21 kPa O ₂ , but can develop at a lower O ₂ pressure (2 kPa O ₂). We show here that plant [FeFe]-hydrogenase-like GOLLUM genes are essential for plant development and cell cycle progression. The mutant phenotypes of these plants are seen in normoxic conditions, but not under conditions of mild hypoxia (5 kPa O ₂). Transcriptomic and metabolomic experiments showed that the mutation enhances the expression of some hypoxia-induced genes under normal atmospheric O ₂ conditions and changes the cellular content of metabolites related to energy metabolism. In conclusion, [FeFe]-hydrogenase-like proteins play a central role in eukaryotes including the adaptation of plants to the ambient O ₂ partial pressure.
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Liens

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