

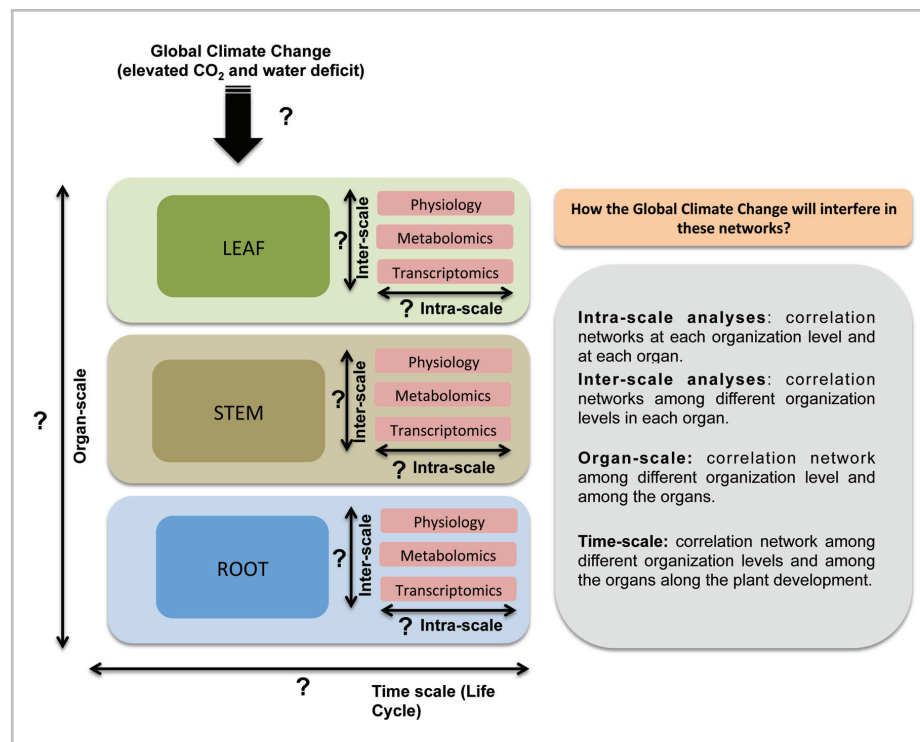
USING SYSTEMS BIOLOGY APPROACH TO DEVELOP A MODEL FOR WHOLE PLANT FUNCTIONING

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The advance of the sciences of the global climate changes and bioenergy require deep understanding of how plants work in a changing environment. Although models of native plants have been studied from the viewpoint of their ecophysiology, biochemistry and molecular biology, these levels of organization have not been approached in an integrated way. The limitation is the enormous amounts of data produced. This proposal aims at understanding the interaction among the different organizational levels through analysis of a data set from a C₄ model plant (sorghum) cultivated at elevated CO₂ combined with water deficit. We intend to obtain data on the physiology, metabolism and gene expression of sorghum grown in four different conditions: 1) ambient [CO₂] well watered; 2) elevated [CO₂] well watered; 3) ambient [CO₂] with water deficit and 4) elevated [CO₂] with water deficit. Two groups of plant sciences will interact with one group of mathematics and computing sciences to reach the following goals: 1) test and refine tools for network analysis in biology; 2) develop tools for the integration of data from different experiments; 3) develop data visualization tools; 4) attempts to extrapolate to other species.



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