Response to paper by Juana M. Gancedo (FEBS Lett. 175 (1984) 369–370)

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We wish to make two points that seem to dissipate Dr Gancedo's argument that our recently reported results [1] can be attributed to a metabolite-induced activation of PFP and PFK rather than to a reversible conversion between these two catalytic activities. (i) PFP is not activated by the metabolite essential for its generation from PFK, i.e., UDP-glucose, as would be required by Dr Gancedo's explanation. Data to this effect have been obtained not only by us but by others as well [2]. (ii) Similarly, the metabolites we reported to bring about the conversion of PFP to PFK – fructose 2,6-biphosphate, ATP, fructose 6-phosphate – have either no or minimal effect on the activity of plant cytosolic PFK under the assay conditions used. Again, this conclusion has been reached in several laboratories, especially in the case of fructose 2,6-bisphosphate [3,4].

As for Dr Gancedo's point that the actual PFP and PFK activities do not change appreciably during interconversion, we can say that the observed interconversion between PFP and PFK is complex and, because of the newness of its discovery, not yet fully understood. One possibility accounting for the constancy of PFK activity following conversion treatment is that the conversion metabolites unmask additional ATP-linked sites during dissociation of PFK to PFP. In this same vein, the increase in PFP activity seen on the generation of PFK can be ascribed to an activation of PFP that is necessary for conversion. Experiments are currently in progress to determine if these explanations are valid not only for plant PFK/PFP, but also for mammalian PFK which we recently found to be reversibly converted to a form capable of using pyrophosphate in a similar manner [5].

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