Enzyme activities in aged conidia of N. crassa

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Abstract
Enzyme activities in aged conidia of N. crassa

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Table 1. Inhibition of FDPase by cysteine and its reversal by pyruvate.

<table>
<thead>
<tr>
<th>Addition to the reaction mixture*</th>
<th>Glucose grown</th>
<th>Glycerol grown</th>
<th>Ethanol grown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>22**</td>
<td>5.5</td>
<td>36</td>
</tr>
<tr>
<td>Cysteine (8 mM)</td>
<td>7</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Pyruvate (0.5 mM)</td>
<td>36</td>
<td>68</td>
<td>40</td>
</tr>
<tr>
<td>Cysteine (8 mM) + Pyruvate (0.5 mM)</td>
<td>14</td>
<td>40</td>
<td>34</td>
</tr>
<tr>
<td>Pyruvate (1 mM)</td>
<td>17</td>
<td>42</td>
<td>38</td>
</tr>
</tbody>
</table>

*The reaction mixture contained FDP (0.5 mM), Tris-HCl buffer (pH 7.5, 40 mM), EDTA (2 mM), MgCl₂ (20 mM), KCl (100 mM), and enzyme protein (100 µg).
**FDPase activity in units/mg protein.

There results confirm the observation that gluconeogenic substrates derepress the formation of Neurospora FDPase and bring out the interesting observation of the reversal of cysteine inhibition of the enzyme by pyruvate. Potassium ions, which reverse the inhibitory effect of pyruvate on FDP-aldolase (Mattoo and Rao), complemented the stimulatory effect of pyruvate on FDPase. We, therefore, suggest that pyruvate might regulate gluconeogenesis by acting as a “feed-forward” activator of FDPase and keeping it in an active state. Intracellular levels of potassium ions, pyruvate and FDP at the site of the enzyme in vivo could therefore play an important role in the control of FDPase activity and of gluconeogenesis. -- We thank Professor V.V. Modi for his interest.


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The results, summarized on Table 1, show that the decline in activities of the five enzymes investigated until now, shows ageing patterns which do not parallel the decline in viability of the cells. Evidently, the aged conidia are able to overcome the shortage of vital enzymes and germinate, since a drastic diminution of important enzyme activities (the presence of undetectable vestigial activities cannot be ruled out) like those of aspartate transcarbamylase and NADP-dependent glutamate dehydrogenase are not reflected in a similar loss in viability. These results do not exclude the possibility that one or more key enzymes could show activity variations paralleling the decay in survival, and the central question whether the diminution of enzyme activity (or activities) is a cause of an effect of the ageing process, remains open.

This work was supported by grants No. 5473 and No. 5511 of the Consejo Nacional de Investigaciones Científicas y Técnicas of Argentina. - - - Universidad de Buenos Aires, Facultad de Farmacia y Bioquímica, Departamento de Ciencias Biológicas, Junín 956, Buenos Aires, Argentina.

Loo, M.W.S. A temperature-sensitive mutant of Neurospora defective in ribosome processing (rip-l).

Temperature-sensitive (t) mutants were isolated by the inositol-less death enrichment technique, during a search for phase-specific conidial germination mutants. Although no phase-specific mutants were found among 64 (t) isolates, there were mutants in which both conidial germination and mycelial growth were arrested at temperatures above 33°C. These were screened for defects in macromolecular synthesis by monitoring their incorporation of radioactive precursors into DNA, RNA, and protein at 20°C and 37°C (for labeling procedures, see Loo 1975 J. Bacteriol., 121: 286).