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Dear Roger:

I just now noticed the remark on p. 130 of Bacterial Oxidation...II., concerning the behavior of rapidly dried cells. Does it mean that rapidly dried cells will adapt to new substrates? Are such cells inviable?

The Summer Session catalog arrived a few days ago, and I did not notice your name in it. I hope that this does not mean that you will be away from campus during August. I have been looking forward to doing some work together on adaptive mechanisms.

Lately I've picked up a mutant of coli K-12 which forms galactosidase constitutively, viz., in amounts comparable to K-12 grown on lactose, but whether grown on glucose, lactose, maltose, succinate, peptone, etc. There is some quantitative variation, over perhaps a 10-fold range, depending on the growth-substrate. Maltose grows cells of the mutant which have ~~much~~ more activity than lactose-grown cells of either K-12 or the mutant; arabinose, xylose or gluconate give cells with rather less activity, but still much more than K-12/glucose. K-12 also forms some galactosidase on almost all media, but except on lactose not enough to allow significant or measurable fermentation of lactose.

While studying some controls, I was surprised to find that K-12 itself which normally attacks maltose and galactose only adaptively, can be "preadapted" in the absence of the specific substrates, by growth on very rich media. I haven't explored all the necessary conditions as yet, but a heavily buffered phosphate-citrate base, with .1% glucose (i.e., no excess acidity) and 1% N-Z-Case gives cells which attack either maltose or galactose at nearly optimum rates, from zero time.

As you may imagine, I am adapting to some reservations about the absolute character and specificity of enzyme adaptation. Obviously, this can't affect your general conclusions on aromatic oxidation to any extent, especially ~~with~~ with the direct confirmations, but I do wonder whether it is essential to forward any special explanation of cross-adaptations to proto-catechuic ac. But any ^{one} does ~~it~~ ^{it} keto-adipate stimulate protocatechuate adaptation?

but not lactose.

Sincerely,

Joshua Lederberg