LETTERS TO THE EDITORS

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A SUPPRESSOR MUTATION IN *ESCHERICHIA COLI**

Nutritionally deficient mutant strains of bacteria (auxotrophs) are often capable of undergoing "reversion," giving rise to strains having the wild type nutritional state (prototrophs). It is usually impossible to determine whether the prototrophs are true back-mutants, or whether the wild phenotype is restored by the action of an independent suppressor mutation.

An auxotroph requiring histidine was isolated from strain B/r of *Escherichia coli* (which grows well on minimal medium) after ultraviolet irradiation and layering.[1] Some time later, the histidineless strain was irradiated with ultraviolet and subjected to penicillin screening.[2,3] Among the mutants isolated was one requiring serine or glycine in addition to histidine. This diauxotroph, strain M2, was thus characterized by two growth factor requirements acquired separately and serially, presumably by two mutational steps.

A study of the reversion behavior of strain M2 revealed an interesting departure from the usual result with diauxotrophs. Prototrophs were obtained with a frequency of about $1/10^7$ bacteria plated in minimal medium. When the strain was plated in minimal medium supplemented with histidine, or with serine, prototrophs were obtained in addition to the expected single reversions, and the rate of double reversion was found to be about equal to the rate of single reversion from either of the separate requirements. The prototrophs obtained, therefore, could not possibly result from coincidental back-mutation of the two independent requirements. The quantitative results strongly suggested a suppressor, as did the fact that the growth rate of the prototrophs obtained from M2 was considerably slower than that of the wild type parent strain in minimal medium.

The suppressor hypothesis was tested by attempting to induce reversion of the postulated suppressor, thereby releasing the double requirement for histidine and serine or glycine in a single step. A prototroph strain, M2P, obtained from a plating of M2 on minimal medium, was irradiated with ultraviolet light and put through the penicillin procedure. Mutants were screened on minimal plates supplemented with both serine and histidine, so that any variant requiring one or both of these growth factors could be detected. Colonies appearing on these plates were analyzed, and eight out of 130 tested proved to require *both* histidine and serine or glycine. As a control, the wild type strain was irradiated and penicillin-screened in exactly the same way. Three hundred twenty colonies appearing on the serine-histidine supplemented plates were analyzed, and none was found to require both growth factors. These results can best be interpreted by