

Lymphocyte enzyme activities in East African blacks: decrease in 5'nucleotidase and possible relation to immunosuppression.

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Abstract

Microanalysis of subcellular organelle marker enzymes was applied to cryopreserved lymphocytes (obtained and processed in the field) from East African blacks with moderate to severe malnutrition and subject to locally endemic parasitic and infectious diseases. An initial study demonstrated that activities of these enzymes, with the partial exception of catalase, were stable to cryopreservation. Cryopreserved and thawed lymphocyte specimens (1 to 3 X 10⁶ viable cells) from 26 Africans and 20 Caucasian controls were studied. There was a highly significant decrease in 5'nucleotidase activity in these African subjects. Activity of another plasma membrane enzyme, gamma-glutamyl transferase, and of marker enzymes for other intracellular organelles, was not significantly different between the two groups, indicating that the nucleotidase alteration is highly specific. 5'Nucleotidase activity in a group of 17 East African blacks of high socio-economic status lay between the values obtained in the other two groups and was not significantly different from either. Further studies on 5'nucleotidase showed no evidence that the enzyme is functionally different in Africans. The differences in activity of this enzyme in Africans may reflect the known immuno-suppressive effects of infectious disease and malnutrition or may have a genetic basis which may in turn be associated with the pathogenesis of secondary immunodeficiency.