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A Defective Purine Nucleotide Synthesis Pathway in Psoriatic Patients

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Purine nucleotide concentrations in skin- and blood cells of psoriatic patients are abnormal: The increase in the steady state level of cGMP and the decrease in the cAMP concentrations are associated with an enhanced rate of cellular proliferation. Concomitantly we found in the present study decreased ADP and ATP concentrations in blood cells ($p < 0.0001$). The change in nucleotide concentrations suggests a defective purine nucleotide synthesis pathway. Stimulation of the Krebs cycle with fumaric acid raises ATP ($p < 0.0001$) and most probably CAMP levels and at the same time slows down the purine nucleotide synthesis through end-product inhibition. Both effects can inhibit DNA and protein synthesis activity, which results in inhibition of cellular proliferation. Fumaric acid seems therefore a useful treatment for psoriatic lesions if liver and kidney functions (purine nucleotide and urea cycle) are controlled during treatment.

Key words: Fumaric acid; DNA synthesis; Protein synthesis