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Thin-layer chromatography of L-carnosine and β-alanine

The dipeptide L-carnosine is hydrolysed by the enzyme carnosinase (E.C 3.4.3.3) which occurs in normal human serum[1]. A deficiency of serum-carnosinase in five mentally deficient patients who excreted increased amounts of carnosine in the urine has been described[1,2,3]. A radiochemical assay for the determination of serum-carnosinase activity using a paper chromatographic separation of L-carnosine and β-alanine has been reported[4].

In this communication, we report a thin-layer chromatographic (TLC) procedure for the separation of L-carnosine and β-alanine.

Materials and methods

L-Carnosine (cyclochemical), L-histidine (Calbiochem), and β-alanine (Calbiochem) were used without further purification. Aqueous solutions of approximately 1 mg/ml were prepared just prior to use. TLC was carried out on cellulose coated on inert poly-(ethylene terephthalate) (Eastman chromagram sheet 6065). Samples were applied with 3-μl capillaries at 2 cm distance from each other, and the solvent evaporated by using a stream of warm air. The chromatogram was developed for 2 h at room temperature in a solvent system consisting of three volumes of 96 % ethanol to one volume of 1 *M* ammonium acetate (3.3 m*M* in EDTA), pH 4.0. After drying the compounds were localized by staining with a ninhydrin stain.

Results

The procedure outlined resulted in the separation of L-carnosine and β-alanine (R_F values for L-carnosine and β-alanine, 0.19 and 0.40, respectively). There was no separation of L-histidine from L-carnosine.

Conclusion

The system described for the separation of L-carnosine and β-alanine shows the usual advantages of TLC over paper chromatography[5]. The method can be used as a modification of the method for determination of serum-carnosinase activity previously described[4].

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