

CYSTEINE TRANSPORT INTO WOOL FOLLICLES

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Amino acids enter mammalian cells by attaching to carrier proteins residing in the cell membranes. Considerable research effort has been expended to characterise these carriers in a wide range of tissues but to date no attempt has been made to characterise the transport of amino acids into wool follicles, despite their unusual amino acid requirements (Reis 1970). We report here initial experiments to examine the characteristics of cysteine transport into follicles in skin *in vitro*.

Skin strips (1.0 mm x 10 mm) taken from anaesthetised sheep were blotted free of blood, dissected at the sebaceous gland level and placed in 0.5mL Krebs/Ringer phosphate buffer, containing ³⁵S-labelled L-cysteine (92.5 Bq/mL), dithiothreitol (2mM) and cold cysteine (4mM). The strips were then incubated at 37°C in 0.5% air/5% CO₂ for 120 minutes, repeatedly washed in cold (4°C) 5% trichloroacetic acid solution (Ward and Harris 1976) and scintillation counted after solubilisation. Treatments were: (1) control; (2) minus Na (NaCl replaced by choline chloride); (3) plus alanine; (4) plus lysine; (5) plus leucine; (6) plus glutamate; (7) plus methyl amino isobutyrate (aib); and (8) plus 2-amino-2-norbornane-carboxylic acid (bch). All competitors were included at 40mM.

Cysteine uptake was via a saturable, low affinity, high capacity transporter (Wilson *et al.* 1996) which was sodium-independent and independent of any of the known competitors of systems A (aib, alanine, serine), ASC (alanine, serine), L (leucine, bch), y⁺ (lysine) and x^{c-} (glutamate) in other tissues (Figure 1).

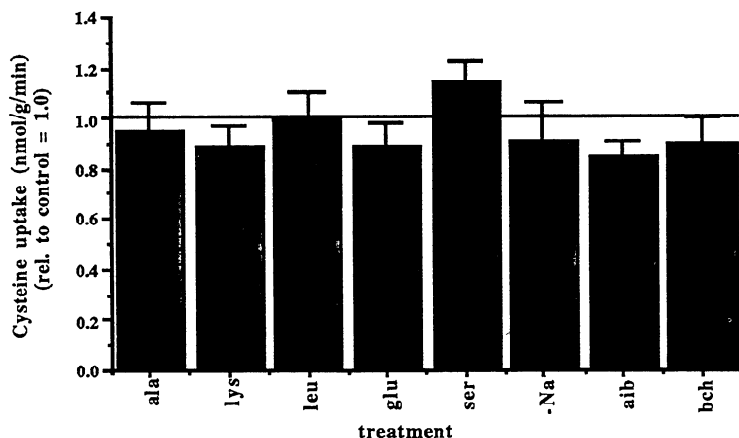


Figure 1. L-cysteine uptake into cultured skin is independent of Na and is not depressed by competitors for potential carrier proteins. Values are means \pm sem relative to control = 1.0

Given that cysteine does not appear to enter the follicle by the usual cysteine transporters (ASC or L) it is possible that the follicle has developed a unique transporter of cysteine to allow the unusually high rates of keratin synthesis to occur.

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