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# Transport of Specific Amino Acids into Cells

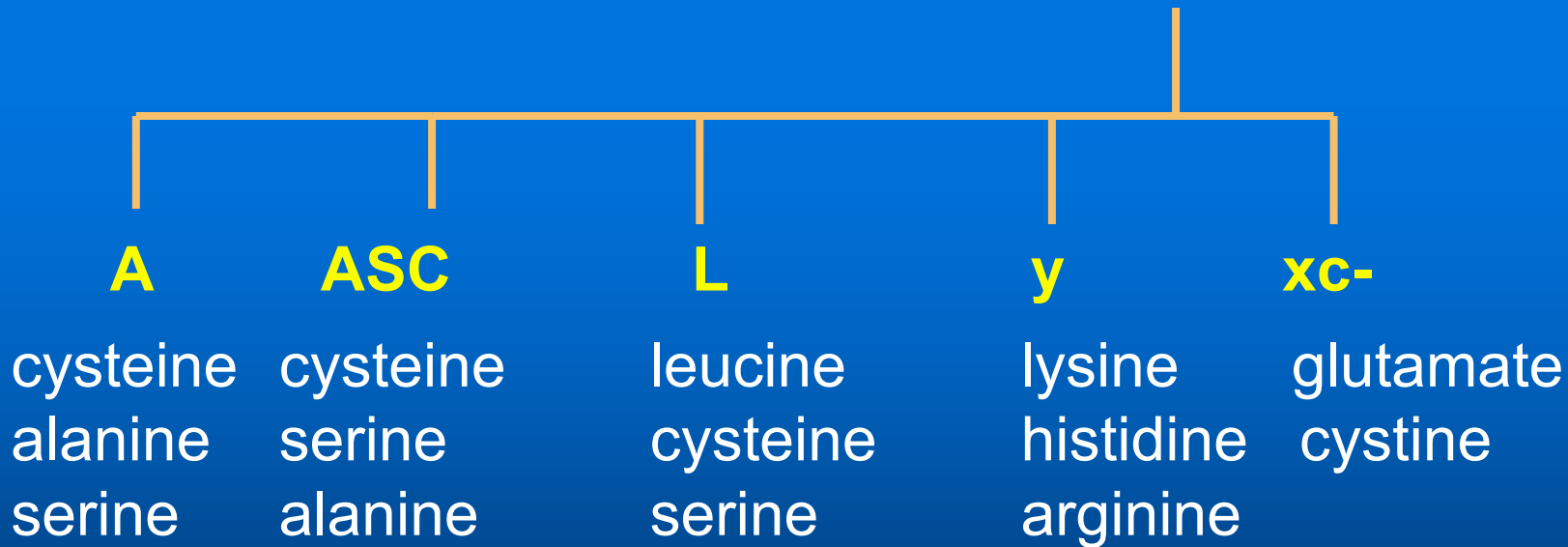
Produced for the CRC for Premium Quality Wool undergraduate program by;  
Prof. Phil Hynd, The University of Adelaide.



# Amino Acids and Wool Growth



amino acid transport proteins



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# Amino acid transport systems in mammalian cells

- approx. 15 different systems

System	amino acid	distribution
• A	ala, pro, gly	widespread
• *ASC	ala, ser, cys	widespread
• L	leu, ile, phe, val	widespread
• *xc-	cys, glu	fibroblasts
• *y+	lys, his, arg	widespread
• N	gln, his, arg	hepatocytes...
• gly	gly	RBC, brain....

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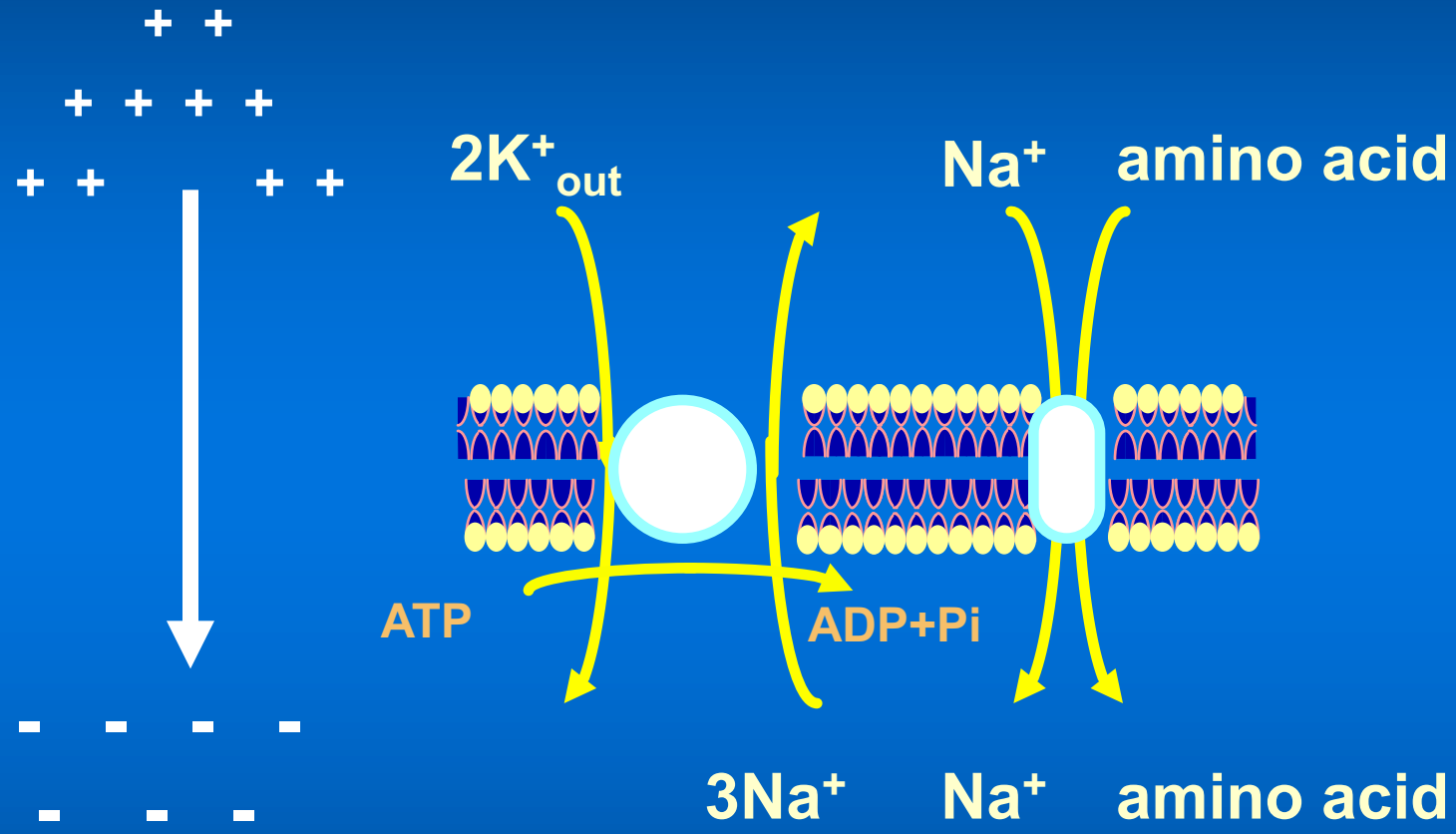
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# System A (ala, pro, gly)



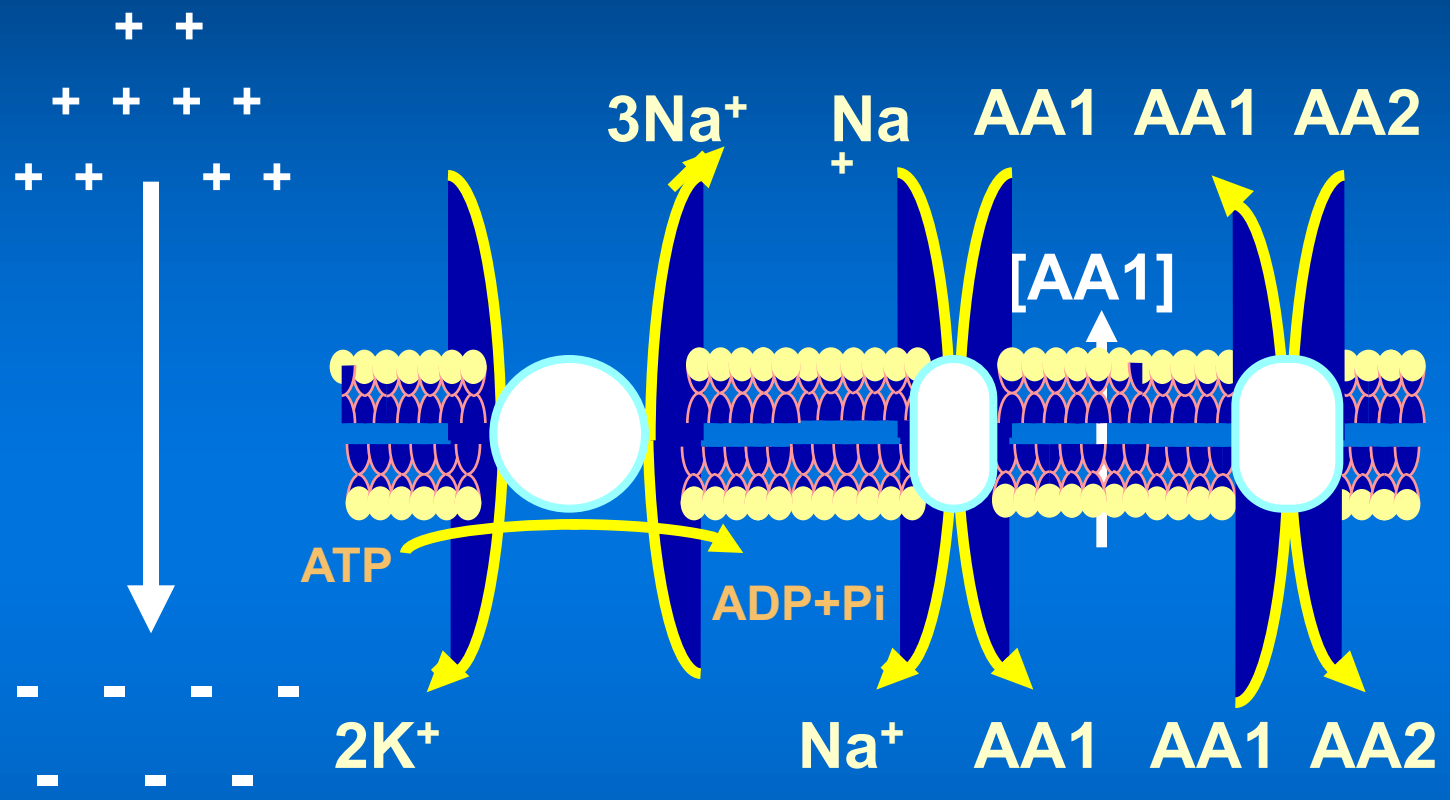
Electrochemical gradient of Na<sup>+</sup>. Backflux of Na<sup>+</sup> with inward movement of amino acid.

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# Systems L (leu, ile, phe, val) & xc- (cys, glu)

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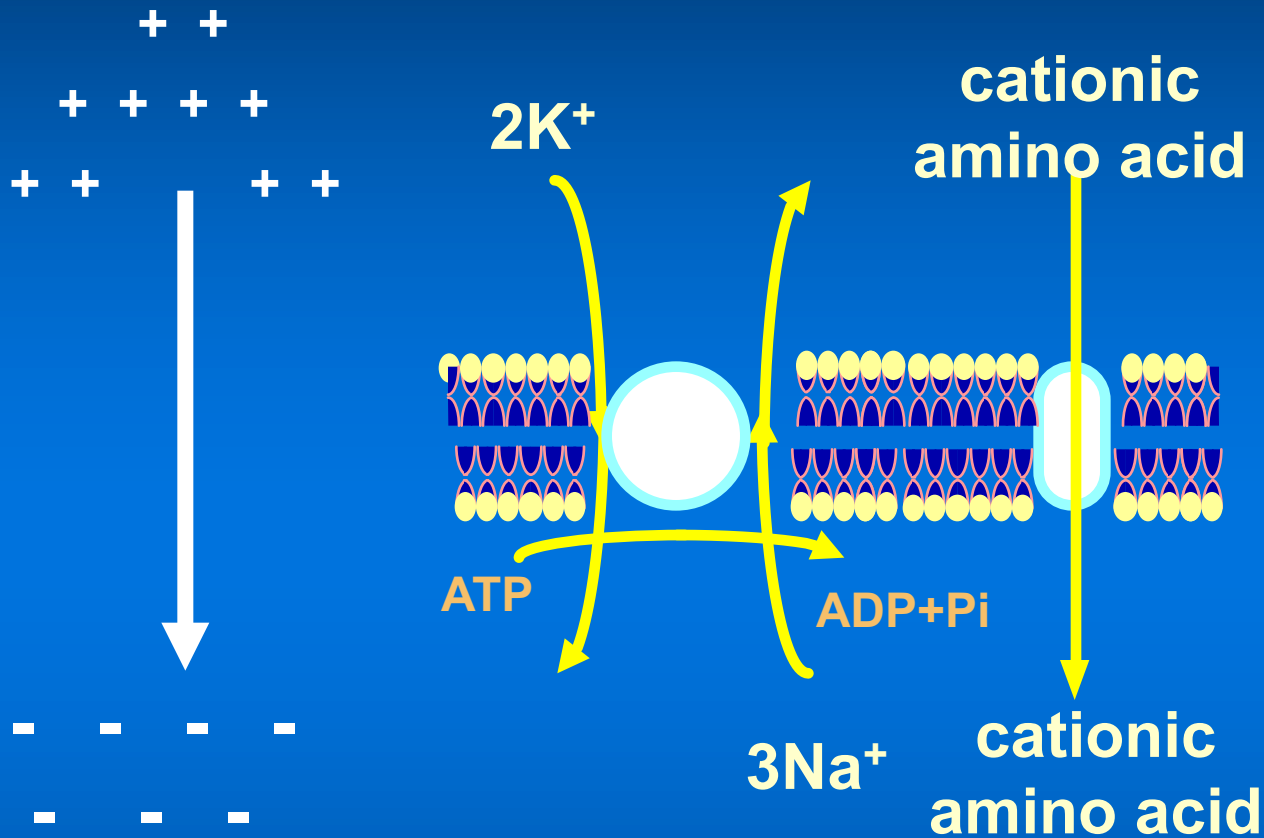


A secondary system causes accumulation of amino acid 1 by sodium symport, generating a chemical gradient of AA1. The efflux of AA1 down this gradient facilitates transport of AA2.





# System y+ (lys, his, arg)



Transmembrane potential drives accumulation of cationic amino acids by a mechanism of facilitated diffusion.



# Site of expression of mRNA for a follicle cysteine transporter

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site of CYST1  
mRNA expression

site of cysteine  
uptake into fibre

