



CRC

for

Premium

Quality

Wool

# Cysteine Rich KAP Proteins

Produced for the CRC for Premium Quality Wool undergraduate program by;  
Dr. Barry Powell & Dr. C. Simon Bawden, The University of Adelaide.



# Cysteine-Rich Proteins

- **Cys content:**
  - 10- 40 mol%
- **Abundant amino acids:**
  - cys, ser, thr, arg, pro, gln
- **Proteins:**
  - ~ 10 families
    - neutral to very basic proteins
  - 100 - 300 amino acids

CRC  
for  
Premium  
Quality  
Wool

	<i>Family</i>	<i>Common name</i>	<i>Number of genes</i>
<i>Keratin IF associated protein (matrix) Cysteine-rich</i>	KAP1, 2, 3, 11	(HS)	≥ 20
	KAP4, 9 12	(UHS)	≥ 10
	KAP5, 10	cuticle	≥ 10

**Common repeat motif:**





# KAP1 Family

151-181 amino acids, ~22 mol % cysteine

KAP1.1  
(HSB2A)

ACCSTSF CGFPICSTGGTCGSSPCQPT  
CCQTSCCQPTSIQTSCCQPISIQTS CCQ  
PTSIQTSCCQPTCLQTSGCETGCGIGG  
SIGYGQVGSSGAVSSRTRWCRPDCRV  
EGTSLPPCCVVSCTPPSCCQLYYAQAS  
CCRPSYCGQSCCRPACCCQPTCIEPIC  
EPSCCEPTC

KAP1.1  
(HSB2A)



KAP1.2  
(HSB2B)



KAP1.3  
(HSB2C)



KAP1.4  
(HSB2D)



CRC  
for  
Premium  
Quality  
Wool



# KAP3 Family

94 - 97 amino acids, ~16 mol % cysteine

KAP3.3  
(HS BIIB)

ACCARLCCSVPTSPATTICSSD  
KFCRCGVCLPSTCPHTVWLLQ  
PTCCCDNRPPYHVPQPSVPT  
CFLLNSSQPTPRLESINLTTYTQ  
SSCEPCIPSCC

- X Differences between KAP3.3 and KAP3.2 proteins
- XX Differences between KAP3.3 and KAP3.4 proteins

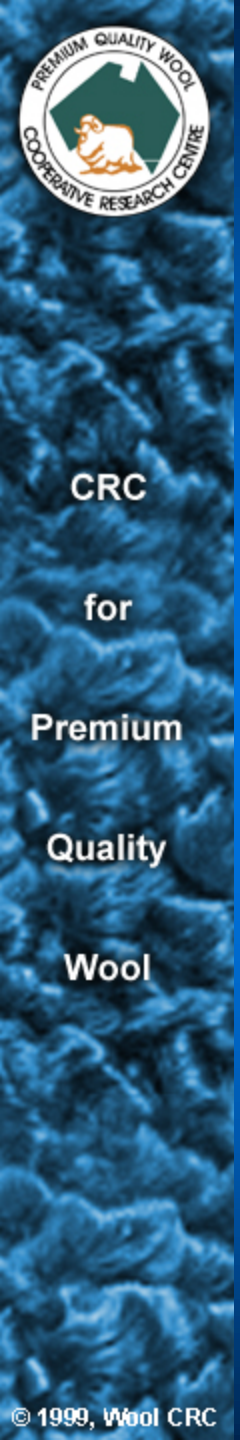
CRC

for

Premium

Quality

Wool



# KAP5 Family

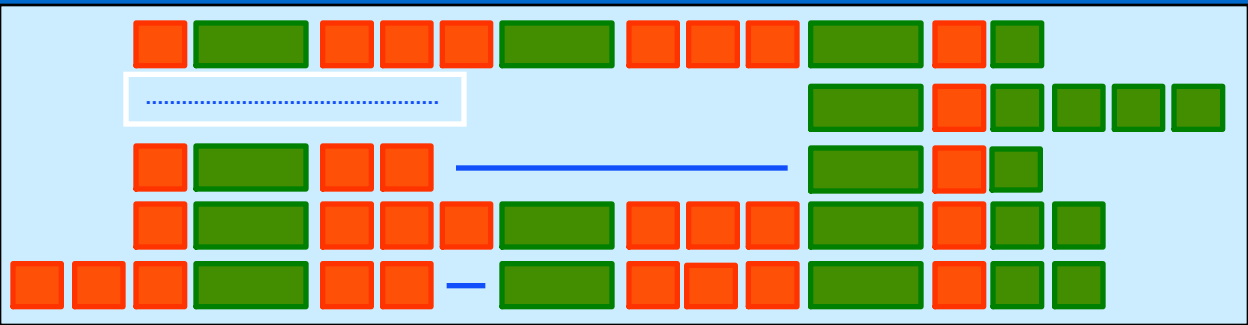
168 - 200+ amino acids  
~33 mol % cysteine, ~27 mol % glycine

KAP5.1

```

GCSGC SGGCGSSCGGC GSRCGGC SSSC
CVPVCCCKPVCCVPACSCSSCG KGGCG
SSCGGS KGGCGSCGGS KGGCGSCGGC G
SSCCKPVCCVPACSCSSCG KGGCGSCG
GSKGGCGSCGGS KGGCGSCGGC GSGC
GSSCCVPVCCVPACSCSSCG KGGCGSC
GCS QSSCCVPVCCQRKI
  
```

KAP5.1  
KAP5.2  
KAP5.3p  
KAP5.4  
KAP5.5



CRC  
for  
Premium  
Quality  
Wool