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Supplemental information

**The susceptibility of disulfide bonds to modification in keratin fibers
undergoing tensile stress**

**Duane P. Harland, Crisan Popescu, Marina Richena, Santanu Deb-Choudhury, Claudia
Wichlatz, Erin Lee, and Jeffrey E. Plowman**

Supplementary file for

The susceptibility of disulfide bonds to modification in keratin fibres undergoing tensile stress

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Data tables of peptides for each sample

Supplementary Table 1. Controls

Supplementary Table 1

Control 1			
Sequence	Modifications	Accessions	Proteins
PTSCQPAPCR	Carbamidomethyl: 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 164652864	keratin 31 [Ovis aries]
SLCGSGYGCGSR	Carbamidomethyl: 9	gi 224555998	keratin associated protein 6 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSilGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DVDCAYLK	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 125117	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
LGGYGCYGYGYSR	Carbamidomethyl: 7	gi 224555998	keratin associated protein 6 [Ovis aries]
TGCFSTVSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPR	Carbamidomethyl: 7	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
ILDELTLCCK	Carbamidomethyl: 8	gi 312283590; gi 164652864; gi 426238003	keratin 33B [Ovis aries] keratin 31 [Ovis aries] PREDICTED: keratin 34 [Ovis aries]
DLNMDCVVAEIK	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DLNMDCIVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]

QCCESNLEPLFSGYIETLRR	Carbamidomethyl: 2	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
Control 2			
Sequence	Modifications	Accessions	Proteins
EAE <u>C</u> VEADSGR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
TYQ <u>Q</u> S <u>C</u> VSSCR	Carbamidomethyl: 6	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
LG <u>C</u> GSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
<u>C</u> GP <u>C</u> NSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
TGPATTI <u>C</u> SSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
AF <u>S</u> <u>C</u> VSA <u>C</u> GPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
VGG <u>S</u> ILG <u>C</u> K	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
<u>C</u> CITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
<u>C</u> CITAAPYR	Carbamidomethyl: 1	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
GGVA <u>C</u> GGLTYSSTAGR	Carbamidomethyl: 5	gi 246276; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
DVD <u>C</u> AYLR	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 246276; gi 164652870	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
LG <u>C</u> GY <u>C</u> GYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
LG <u>C</u> GY <u>C</u> GYGYGSR	Carbamidomethyl: 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
L <u>C</u> EGVGAVNVCVSSSR	Carbamidomethyl: 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
ILDELTL <u>C</u> K	Carbamidomethyl: 8	gi 999000013; gi 312283590; gi 426238003	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries] PREDICTED: keratin 34 [Ovis aries]
YSG <u>S</u> <u>C</u> GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]

DLNMD <u>C</u> IVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
Q <u>C</u> CESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
Q <u>C</u> CESNLEPLFSGYIETLRR	Carbamidomethyl: 2	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
SDLEAQVESLKEELL <u>C</u> LK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
SDLEAQVESLKEELI <u>C</u> LK	Carbamidomethyl: 16	gi 999000013; gi 312283590	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries]
Control 3			
Sequence	Modifications	Accessions	Proteins
<u>C</u> PSSFGR	Carbamidomethyl: 1	gi 999000016	KAP 19.3 (tentative) cs39 [Ovis aries]
TGPATTI <u>C</u> SSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
SLCGSGYG <u>C</u> GSR	Carbamidomethyl: 9	gi 32329266	high-glycine tyrosine keratin type II.6 [Capra hircus]
SVSALG <u>S</u> CGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGG <u>S</u> ILG <u>C</u> K	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
<u>C</u> CITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
<u>C</u> CITAAPYR	Carbamidomethyl: 1	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
AF <u>S</u> CVSACGPR	Carbamidomethyl: 4	gi 312283588; gi 1308	keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
GGV <u>A</u> CGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DVD <u>C</u> AYLR	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 125117	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
LG <u>C</u> GYG <u>C</u> GYGYGSR	Carbamidomethyl: 3, 7	gi 32329266	high-glycine tyrosine keratin type II.6 [Capra hircus]
LG <u>C</u> GYGCGYGYGSR	Carbamidomethyl: 3	gi 32329266	high-glycine tyrosine keratin type II.6 [Capra hircus]
QDMA <u>C</u> LLK	Carbamidomethyl: 5	gi 312283584; gi 312283588; gi 1308; gi 125117	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II

			keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
T_CGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCV_SACGPR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
L_CEGVGAVNVCVSSSR	Carbamidomethyl: 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
AVPAFSCV_SACGPR	Carbamidomethyl: 7	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
ILDELT_LCK	Carbamidomethyl: 8	gi 312283590; gi 999000013; gi 999000014; gi 426238003	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries] PREDICTED: keratin 34 [Ovis aries]
YSGSS_CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Control 4			
Sequence	Modifications	Accessions	Proteins
PTSCQPAP_CPR	Carbamidomethyl: 4, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
PTSCQPAP_CPR	Carbamidomethyl: 4	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
PTSCQPAP_CPR	Carbamidomethyl: 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
TYQQSCVSS_CPR	Carbamidomethyl: 10	gi 328905561	keratin-associated protein KAP11-1 [Ovis aries]
LG_CGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
C_GPCNSYVR	Carbamidomethyl: 1	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SVSALGSC_GPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSS_CSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
VGG_SILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
C_CITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
C_CITAAPYR	Carbamidomethyl: 1	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
LE_CINTYR	Carbamidomethyl: 3	gi 999000013; gi 312283592	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33 [Ovis aries]

AFSCVSAACGPR	Carbamidomethyl: 4	gi 1308; gi 312283588	hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
ARLECEINTYR	Carbamidomethyl: 5	gi 999000013; gi 312283592	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33 [Ovis aries]
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 246276	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
AVPAFSCVSAACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LCEGVGSVNVCVSSSR	Carbamidomethyl: 2	gi 1308; gi 246276	hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
ILDELTLCCK	Carbamidomethyl: 8	gi 999000013; gi 312283590; gi 309323371; gi 312283592	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries] keratin 34 [Ovis aries] keratin 33 [Ovis aries]
SQQQEPLVCPNYQSYFR	Carbamidomethyl: 9	gi 999000013; gi 312283590; gi 312283592	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries] keratin 33 [Ovis aries]
DLNMDCVVAEIK	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DLNMDCIVAIEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELLCLK	Carbamidomethyl: 16	gi 309323371	keratin 34 [Ovis aries]
SDLEAQVESLKEELICLK	Carbamidomethyl: 16	gi 999000013; gi 312283590	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries]
Control 5			
Sequence	Modifications	Accessions	Proteins
PTSCQPAPCR	Carbamidomethyl: 4, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
LGCSSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
VGGSSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283588; gi 312283584; gi 1308	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1	gi 312283588; gi 312283584; gi 1308	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]

GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
DVDCAYLR	Carbamidomethyl: 4	gi 312283584; gi 246276; gi 1308; gi 164652870	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 85 [Ovis aries]
QDMA ⁺ LLK	Carbamidomethyl: 5	gi 312283588; gi 312283584; gi 246276; gi 1308; gi 164652870	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 85 [Ovis aries]
T ⁺ CGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
ILDELT ⁺ LCK	Carbamidomethyl: 8	gi 312283590; gi 999000013; gi 426238003; gi 125091	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries] PREDICTED: keratin 34 [Ovis aries] RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
YSGSS ⁺ CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
SQQQEPLV ⁺ C ⁺ PNYQSYFR	Carbamidomethyl: 9	gi 312283590; gi 999000013; gi 426238003; gi 125091	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries] PREDICTED: keratin 34 [Ovis aries] RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
DLNMD ⁺ C ⁺ VVAEIK	Carbamidomethyl: 6	gi 246276; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
DLNMD ⁺ C ⁺ VAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELI ⁺ CLK	Carbamidomethyl: 16	gi 312283590; gi 999000013	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SDLEAQVESLKEELL ⁺ CLK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
Control 6			
Sequence	Modifications	Accessions	Proteins
PTSCQPAP ⁺ CR	Carbamidomethyl: 4, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
TFSS ⁺ CSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

VGG <u>S</u> ILG <u>C</u> K	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
<u>C</u> CITAA <u>P</u> Y <u>R</u>	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
LE <u>C</u> EINT <u>Y</u> R	Carbamidomethyl: 3	gi 164652864; gi 999000014	keratin 31 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
DVD <u>C</u> AY <u>L</u> R	Carbamidomethyl: 4	gi 312283584; gi 246276; gi 1308	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries]
QDMA <u>C</u> LL <u>K</u>	Carbamidomethyl: 5	gi 312283584; gi 246276; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
T <u>C</u> GFSTVGS <u>G</u> FG <u>S</u> R	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPA <u>F</u> SC <u>V</u> SAC <u>G</u> PR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
ILDEL <u>T</u> L <u>C</u> K	Carbamidomethyl: 8	gi 312283590; gi 164652864; gi 426238003; gi 999000014	keratin 33B [Ovis aries] keratin 31 [Ovis aries] PREDICTED: keratin 34 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
YSG <u>S</u> CGSS <u>F</u> PSNL <u>V</u> Y <u>R</u>	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
SQQE <u>P</u> LV <u>C</u> PNYQ <u>S</u> Y <u>F</u> R	Carbamidomethyl: 9	gi 312283590; gi 164652864; gi 426238003; gi 999000014	keratin 33B [Ovis aries] keratin 31 [Ovis aries] PREDICTED: keratin 34 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
DLNMD <u>C</u> VVA <u>E</u> IK	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DLNMD <u>C</u> IVAE <u>I</u> K	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEEL <u>I</u> CL <u>K</u>	Carbamidomethyl: 16	gi 312283590; gi 164652864	keratin 33B [Ovis aries] keratin 31 [Ovis aries]
SDLEAQVESLKEELL <u>C</u> CL <u>K</u>	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
Y <u>S</u> Q <u>L</u> NQVQSLIVSVESQLAE <u>I</u> R	Carbamidomethyl: 3	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
Control 7			
Sequence	Modifications	Accessions	Proteins
PT <u>S</u> Q <u>P</u> AP <u>C</u> R	Carbamidomethyl: 4, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
PT <u>S</u> Q <u>P</u> AP <u>C</u> R	Carbamidomethyl: 4	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]

PTSCQPAPCR	Carbamidomethyl: 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
TGPATTI_CSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIIIB2
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVD_CAYVR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
VGGSilGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CCITAAPYR	Carbamidomethyl: 2	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 999000013; gi 999000014	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
TQTVVSSPCQTSCYRPR	Carbamidomethyl: 13	gi 999000030; gi 426217167	KAP 13.1 (tentative) cs39 [Ovis aries] PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
DVD_CAYLR	Carbamidomethyl: 4	gi 312283584; gi 246276; gi 1308; gi 164652870	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 85 [Ovis aries]
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
LGCGYG_CGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
LPSNPCATTNASSNFCR	Carbamidomethyl: 6, 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
LGCGYG_CGYGYGSR	Carbamidomethyl: 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
QDMA_CLLK	Carbamidomethyl: 5	gi 312283584; gi 246276; gi 312283588; gi 1308; gi 164652870	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 83 [Ovis aries] hair type II keratin

			intermediate filament protein [Ovis aries] keratin 85 [Ovis aries]
T_CGFSTVSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
L_CEGVGSVNVCVSSSR	Carbamidomethyl: 2	gi 246276; gi 1308; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 85 [Ovis aries]
L_CEGVGAVNVCVSSSR	Carbamidomethyl: 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
AVPAFSCVSA_CGPR	Carbamidomethyl: 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
ILDELT_CK	Carbamidomethyl: 8	gi 312283590; gi 999000013; gi 426238003; gi 999000014	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries] PREDICTED: keratin 34 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
YSGSS_CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
SGQSLSFQPT_CGSGFY	Carbamidomethyl: 11	gi 999000030; gi 426217167	KAP 13.1 (tentative) cs39 [Ovis aries] PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
DLNMD_CVVAEIK	Carbamidomethyl: 6	gi 246276; gi 164652870	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] keratin 85 [Ovis aries]
PLTFISSG_CQPLSGVSTVCKPVR	Carbamidomethyl: 9	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
DLNMD_CIVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELI_CLK	Carbamidomethyl: 16	gi 312283590; gi 999000013	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SDLEAQVESLKEELL_CLK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
Q_CCESNLEPLFSGYIETLR	Carbamidomethyl: 2	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]

Supplementary Table 2. Sample 1a

Supplementary Table 2

Sample 1a 25% stretch -1			
Sequence	Modifications	Accessions	Proteins
ASSFSC_GSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

GCGGGSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TFRTSPCC	Carbamidomethyl: 7, 8	gi 999000042	KAP 2.3 var3 (tentative) cs39 [Ovis aries]
TGPATTI_CSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
VGGSILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSSPCQTSYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
TGPATTI_CSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
TCGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]

LCEGVGAVNVCVSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
SISTVCQPVGGVSTICQPTCGVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
YSGSSCGSSFFSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITPCISSPCAPAAPCTPCVPR	Carbamidomethyl: 5, 10, 16, 19	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
SGQSLSFQPTCGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Sample 1a 25% stretch -2			
Sequence	Modifications	Accessions	Proteins
EAECAEADSGR	Carbamidomethyl: 4	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SSSCSSLSSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
GCGCGSFR	Carbamidomethyl: 2, 4	gi 999000015; gi 999000016	KAP 19.5 (tentative) cs39 [Ovis aries] KAP 19.3 (tentative) cs39 [Ovis aries]
CPSSFGR	Carbamidomethyl: 1	gi 999000016	KAP 19.3 (tentative) cs39 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SRCGPCNSYVR	Carbamidomethyl: 3, 6	gi 57164221	keratin, type I microfibrillar 48 kDa, component 8C-1 [Ovis aries]
VGGSILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 57164221	keratin, type I microfibrillar 48 kDa, component 8C-1 [Ovis aries]
LGCSSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TGPATTICSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIIIB2
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
TRCGPCNTFVH	Carbamidomethyl: 3, 6	gi 125091	RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSilGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 125091	RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSSPCQTSYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 125117	hair keratin type II intermediate filament [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
TGPATTICSSDKF	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
TCGFSTVSGGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LCEGVGAVNVCVSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
SISTVCQPVGGVSTICQPTCGVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
YSGSSCGSSFPNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITPCISSPCAPAAPCTPCVPR	Carbamidomethyl: 5, 10, 16, 19	gi 57164221	keratin, type I microfibrillar 48 kDa, component 8C-1 [Ovis aries]
SGQSLSFQPTCGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
SQQQEPLLCPNYQSYFR	Carbamidomethyl: 9	gi 309323371	keratin 34 [Ovis aries]
QCCESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGYGICGFPVLSSGSGFCQPTFFASR	Carbamidomethyl: 6, 18	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]

Sample 1a 25% stretch -3			
Sequence	Modifications	Accessions	Proteins
SSSCSSLSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
GCGCGSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRCGPCNSVVR	Carbamidomethyl: 3, 6	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
VSSCCGSVCSDQSCGR	Carbamidomethyl: 4, 5, 9, 14	gi 426237981	PREDICTED: keratin-associated protein 4-8-like isoform 2 [Ovis aries]
TYQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
TGPATTICSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
CGPCNSVVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
CCQSVCCQSPCR	Carbamidomethyl: 1, 2, 6, 7, 11	gi 426237981	PREDICTED: keratin-associated protein 4-8-like isoform 2 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSA CGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSSPCQTSCYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGCGYCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]

T <u>C</u> G <u>F</u> S <u>T</u> V <u>G</u> S <u>G</u> F <u>G</u> S <u>R</u>	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPA <u>F</u> S <u>C</u> V <u>S</u> A <u>C</u> G <u>P</u> R <u>P</u> G <u>R</u>	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
L <u>C</u> E <u>G</u> V <u>G</u> A <u>V</u> N <u>V</u> <u>C</u> V <u>S</u> S <u>S</u> R	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
S <u>I</u> S <u>T</u> V <u>C</u> Q <u>P</u> V <u>G</u> G <u>V</u> S <u>T</u> I <u>C</u> Q <u>P</u> T <u>C</u> G <u>V</u> S <u>R</u>	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
Y <u>S</u> G <u>S</u> S <u>C</u> G <u>S</u> S <u>F</u> P <u>S</u> N <u>L</u> V <u>Y</u> R	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
T <u>I</u> T <u>P</u> <u>C</u> I <u>S</u> S <u>P</u> <u>C</u> A <u>P</u> A <u>A</u> P <u>C</u> T <u>P</u> <u>C</u> V <u>P</u> R	Carbamidomethyl: 5, 10, 16, 19	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
S <u>G</u> Q <u>S</u> L <u>S</u> F <u>Q</u> P <u>T</u> <u>C</u> G <u>S</u> G <u>F</u> Y	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
L <u>G</u> Y <u>G</u> I <u>C</u> G <u>F</u> P <u>V</u> L <u>S</u> S <u>G</u> S <u>G</u> F <u>C</u> Q <u>P</u> T <u>F</u> F <u>A</u> S <u>R</u>	Carbamidomethyl: 6, 18	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
Sample 1a 25% stretch -4			
Sequence	Modifications	Accessions	Proteins
E <u>A</u> E <u>C</u> A <u>E</u> A <u>D</u> S <u>G</u> R	Carbamidomethyl: 4	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
S <u>S</u> S <u>C</u> S <u>S</u> L <u>S</u> S <u>G</u> S <u>R</u>	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
A <u>S</u> S <u>F</u> S <u>C</u> G <u>S</u> S <u>R</u>	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
G <u>C</u> G <u>C</u> G <u>S</u> F <u>R</u>	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
T <u>Y</u> Q <u>Q</u> S <u>C</u> V <u>S</u> S <u>C</u> R	Carbamidomethyl: 6, 10	gi 328905561	keratin-associated protein KAP11-1 [Ovis aries]
R <u>L</u> G <u>C</u> G <u>S</u> G <u>F</u> R	Carbamidomethyl: 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
S <u>V</u> C <u>G</u> G <u>F</u> R	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
T <u>F</u> R <u>T</u> S <u>P</u> <u>C</u> <u>C</u>	Carbamidomethyl: 7, 8	gi 999000042	KAP 2.3 var3 (tentative) cs39 [Ovis aries]
V <u>G</u> G <u>S</u> I <u>L</u> G <u>C</u> K <u>K</u>	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
<u>C</u> G <u>P</u> <u>C</u> N <u>S</u> Y <u>V</u> R	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
T <u>G</u> P <u>A</u> T <u>T</u> I <u>C</u> S <u>S</u> D <u>K</u>	Carbamidomethyl: 8	gi 999000024	KAP 3.2 (tentative) cs39 [Ovis aries]
L <u>G</u> <u>C</u> G <u>S</u> G <u>F</u> R	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
S <u>R</u> F <u>G</u> P <u>C</u> N <u>T</u> S <u>G</u> <u>C</u>	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
S <u>V</u> S <u>A</u> L <u>G</u> S <u>C</u> G <u>P</u> R	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TQTVVSSPQCTSCYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 125090; gi 999000014	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 999000024	KAP 3.2 (tentative) cs39 [Ovis aries]
GGVACGGLTYSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
DVDCAYLR	Carbamidomethyl: 4	gi 312283584; gi 125117	hair keratin type II intermediate filament [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
VGGSILGCK	Propionamide: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TGPATTICSSDKF	Carbamidomethyl: 8	gi 999000024	KAP 3.2 (tentative) cs39 [Ovis aries]
T_CGFSTVSGSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SISTV_CQPVGGVSTI_CQPT_CGVSR	Carbamidomethyl: 6, 16, 20	gi 328905561	keratin-associated protein KAP11-1 [Ovis aries]
TGSCCGPTFSSLS_CGGGCLQPR	Carbamidomethyl: 4, 5, 14, 18	gi 999000042	KAP 2.3 var3 (tentative) cs39 [Ovis aries]
YSGSS_CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITP_CISSP_CAPAAP_CTP_CVPR	Carbamidomethyl: 5, 10, 16, 19	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
QIASGPVATGGSSITVLAPDSCQPR	Carbamidomethyl: 21	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

SGQSLSFQPTCGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
DLNMDCVVAEIK	Propionamide: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
QCCESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGYGICGFVPLSSGSGFCQPTFFASR	Carbamidomethyl: 6, 18	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
Sample 1a 25% stretch -5			
Sequence	Modifications	Accessions	Proteins
SSSCSSLSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
GCGCGSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TYQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
TFRTSPCC	Carbamidomethyl: 7, 8	gi 999000042	KAP 2.3 var3 (tentative) cs39 [Ovis aries]
TGPATTICSSDK	Carbamidomethyl: 8	gi 165917	BIIB2 high sulfur keratin [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 164652864	keratin 31 [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
VGGSILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSA CGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]

CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATTI_CSSDKF_C	Carbamidomethyl: 8, 14	gi 165917	BIIB2 high sulfur keratin [Ovis aries]
DVD_CAYLR	Carbamidomethyl: 4	gi 312283584; gi 246276	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGGYGC_GYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
TGPATTI_CSSDKF	Carbamidomethyl: 8	gi 165917	BIIB2 high sulfur keratin [Ovis aries]
T_CGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
CCITAAPYRGIS_CYR	Carbamidomethyl: 1, 2, 13	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
L_CEGVGSVNV_CVSSSR	Carbamidomethyl: 2, 11	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
AVPAF_CVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TGSCC_GPTFSSLS_CGGG_C_LQPR	Carbamidomethyl: 4, 5, 14, 18	gi 999000042	KAP 2.3 var3 (tentative) cs39 [Ovis aries]
SISTV_CQPVG_VSTI_CQPT_CGVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
TITP_CISSP_CAPAAP_CTP_CVPR	Carbamidomethyl: 5, 10, 16, 19	gi 164652864	keratin 31 [Ovis aries]
YSGSS_CGSSFP_NLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
QIASGPVATGGSITV_LAPD_S_CQPR	Carbamidomethyl: 21	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SGQSL_SFQPT_C_GSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Q_CCESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGYGIC_GFPVLSSGSGF_CQPTFFASR	Carbamidomethyl: 6, 18	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]

Supplementary Table 3. Sample 1b

Supplementary Table 3

Sample 1b stretch to break -1			
Sequence	Modifications	Accessions	Proteins
SSS_CSSLSSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]

ASSFSCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
GCGGGSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SRGPGCNSYVR	Carbamidomethyl: 3, 6	gi 164652864	keratin 31 [Ovis aries]
TFRTSPCC	Carbamidomethyl: 7, 8	gi 125644	RecName: Full=Keratin, high-sulfur matrix protein, IIIA3 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 164652864	keratin 31 [Ovis aries]
VGGGILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
VGGGILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSSPCQTSYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMIIIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TGCFSTVSGGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
LCEGVGAVNVCVSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]

SISTV <u>C</u> QPVGGVSTI <u>C</u> QPT <u>C</u> GVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
ILDELTL <u>L</u> CK	Carbamidomethyl: 8	gi 164652864; gi 312283590	keratin 31 [Ovis aries] keratin 33B [Ovis aries]
TG <u>S</u> CCGPTFSSLS <u>C</u> GGG <u>L</u> QPR	Carbamidomethyl: 4, 5, 14, 18	gi 125644	RecName: Full=Keratin, high-sulfur matrix protein, IIIA3 [Ovis aries]
YSGSS <u>C</u> GSFFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITP <u>C</u> ISSP <u>C</u> APAAP <u>C</u> TP <u>C</u> VPR	Carbamidomethyl: 5, 10, 16, 19	gi 164652864	keratin 31 [Ovis aries]
SGQSLSFQPT <u>C</u> SGGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Q <u>C</u> CESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
Sample 1b stretch to break -2			
Sequence	Modifications	Accessions	Proteins
SVC <u>G</u> GFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
<u>C</u> GPC <u>N</u> SYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
TGPATTI <u>C</u> SSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
VGG <u>S</u> ILG <u>C</u> CK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SRFGPC <u>N</u> TS <u>G</u> C	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
LG <u>C</u> SGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TFSS <u>C</u> SAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SVSALG <u>S</u> CGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SL <u>C</u> GGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
<u>C</u> CISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
AF <u>S</u> CVSA <u>C</u> GPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
VGG <u>S</u> ILG <u>C</u> CK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
<u>C</u> CITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSP <u>C</u> QTS <u>C</u> YRPR	Carbamidomethyl: 9, 13	gi 426217167	PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
TGPATTI <u>C</u> SSDK <u>F</u> CR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2

LGC ^u GYG ^u CGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
T ^u CGFSTVGS ^u SGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAF ^u SC ^u VAC ^u GPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TITPC ^u ISSPC ^u APAAP ^u CTPC ^u VPR	Carbamidomethyl: 5, 10, 16, 19	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SGQSL ^u SFQPT ^u CGSGFY	Carbamidomethyl: 11	gi 426217167	PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
Sample 1b stretch to break -3			
Sequence	Modifications	Accessions	Proteins
EAE ^u CAEAD ^u SGR	Carbamidomethyl: 4	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SS ^u CS ^u SSL ^u SSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
ASS ^u F ^u CS ^u GSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
G ^u CG ^u GSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TYQ ^u Q ^u SC ^u VSS ^u CR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SV ^u CGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
C ^u GPC ^u NSYVR	Carbamidomethyl: 1, 4	gi 164652864	keratin 31 [Ovis aries]
LG ^u CG ^u SGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
VGG ^u SILG ^u C ^u KK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TF ^u SS ^u CAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SVSALG ^u SC ^u GPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SL ^u CGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
C ^u C ^u SAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
C ^u GPC ^u N ^u TFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
VGG ^u SILG ^u C ^u K	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
GGVAC ^u GGLTYSS ^u TAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

DVD <u>C</u> AYLR	Carbamidomethyl: 4	gi 312283584; gi 125117	hair keratin type II intermediate filament [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
LGC <u>G</u> YG <u>C</u> GYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
<u>C</u> CJTAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
T <u>C</u> GFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAF <u>S</u> C <u>V</u> SAC <u>G</u> PRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SISTV <u>C</u> QPVG <u>V</u> STI <u>C</u> QPT <u>C</u> GVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
YSGSS <u>C</u> GSSFPNSLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITP <u>C</u> ISSP <u>C</u> APAAP <u>C</u> TP <u>C</u> VPR	Carbamidomethyl: 5, 10, 16, 19	gi 164652864	keratin 31 [Ovis aries]
QIASGPVATGGSSITVLAPD <u>S</u> QPR	Carbamidomethyl: 21	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SGQSLSFQPT <u>C</u> SGSFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Sample 1b stretch to break -4			
Sequence	Modifications	Accessions	Proteins
ASSF <u>S</u> CGSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
G <u>C</u> G <u>C</u> GSFR	Carbamidomethyl: 2, 4	gi 999000015; gi 999000016	KAP 19.5 (tentative) cs39 [Ovis aries] KAP 19.3 (tentative) cs39 [Ovis aries]
<u>C</u> PSSFGR	Carbamidomethyl: 1	gi 999000016	KAP 19.3 (tentative) cs39 [Ovis aries]
SR <u>C</u> GP <u>C</u> NSYVR	Carbamidomethyl: 3, 6	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
TFRTSP <u>C</u> C	Carbamidomethyl: 7, 8	gi 125644	RecName: Full=Keratin, high-sulfur matrix protein, IIIA3 [Ovis aries]
<u>C</u> GP <u>C</u> NSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
VGGSILG <u>C</u> KK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
L <u>G</u> CGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TGPATTI <u>C</u> SSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
SRFGP <u>C</u> NTSG <u>C</u>	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
TFSS <u>C</u> SAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SVSALG <u>S</u> CGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5

SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSilGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 125091	RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
AFSCVSA_CGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TQTVVSSP_CQTSCYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TGPATTI_CSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
LG_CGYG_CGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AVPAFSCVSA_CGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
T_CGFSTVSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
ILDELT_LCK	Carbamidomethyl: 8	gi 312283590; gi 999000013; gi 125091	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries] RecName: Full=Keratin, type I microfibrillar, 47.6 kDa; AltName: Full=Low-sulfur keratin
TGSCCGPTFSSLS_CGGGCLQPR	Carbamidomethyl: 4, 5, 14, 18	gi 125644	RecName: Full=Keratin, high-sulfur matrix protein, IIIA3 [Ovis aries]
YSGSS_CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITPCISSPCAPAAP_CTP_CVPR	Carbamidomethyl: 5, 10, 16, 19	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SGQSLSFQPT_CGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
DLNMD_CVVAEIK	Propionamide: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DLNMD_CIVAIEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
Sample 1b stretch to break -5			
Sequence	Modifications	Accessions	Proteins
SSSC_SSSLSSGSR	Carbamidomethyl: 4	gi 426219157	PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
ASSFSC_GSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

GISCYR	Carbamidomethyl: 4	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATTI_CSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIIB2
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
VGGSILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATTI_CSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIIB2
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
DVD_CAYLR	Carbamidomethyl: 4	gi 312283584; gi 246276	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
T_CGFSTVSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
YSGSS_CGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITP_CISSPCAPAAPCTPCVPR	Carbamidomethyl: 5, 10, 16, 19	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
QIASGPVATGGSITVLAPDSCQPR	Carbamidomethyl: 21	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SGQSLSFQPT_CGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]

Supplementary Table 4 - Sample 2a

Supplementary Table 4

Sample 2a 25% stretch -1			
Sequence	Modifications	Accessions	Proteins
EAECAEADSGR	Carbamidomethyl: 4	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
PTSCQPAPCR	Carbamidomethyl: 4, 9	gi 999000040	KAP 2.3 var1 (tentative) cs39 [Ovis aries]
CPSSFGR	Carbamidomethyl: 1	gi 999000016	KAP 19.3 (tentative) cs39 [Ovis aries]
TYQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283588; gi 312283584; gi 1308	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CTRPICEPCR	Carbamidomethyl: 1, 6, 9	gi 999000040	KAP 2.3 var1 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAAYVR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
VGGGILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSAAGPR	Carbamidomethyl: 4, 8	gi 312283588; gi 1308	keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283588; gi 312283584; gi 1308	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
TQTVVSSPQTSYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
GGVACGGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 246276	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-

			filament protein component 5 [sheep, wool, Peptide, 503 aa]
ARLE <u>CE</u> INTYR	Carbamidomethyl: 5	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
LPSNP <u>C</u> ATTNASSNF <u>CR</u>	Carbamidomethyl: 6, 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
T <u>CG</u> FSTVGS <u>G</u> FGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
L <u>CE</u> GVGSVNV <u>C</u> VSSSR	Carbamidomethyl: 2, 11	gi 1308; gi 246276	hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
L <u>CE</u> GVGAVNV <u>C</u> VSSSR	Carbamidomethyl: 2, 11	gi 312283588; gi 312283584	keratin 83 [Ovis aries] hair keratin type II intermediate filament [Ovis aries]
AVPAF <u>S</u> <u>C</u> VSAC <u>G</u> PR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
SISTV <u>C</u> QPVG <u>V</u> STI <u>C</u> QPT <u>C</u> GVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
ILDELTL <u>C</u> K	Carbamidomethyl: 8	gi 999000013; gi 312283590; gi 426238003	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries] PREDICTED: keratin 34 [Ovis aries]
YSGSS <u>C</u> GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
VESLKEELL <u>C</u> LK	Carbamidomethyl: 10	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
VESLKEELI <u>C</u> LK	Carbamidomethyl: 10	gi 999000013; gi 312283590	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries]
SGQSLSFQPT <u>C</u> GSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
DLNMD <u>C</u> VVAEIK	Propionamide: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DLNMD <u>C</u> IVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELL <u>C</u> LK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
SDLEAQVESLKEELI <u>C</u> LK	Carbamidomethyl: 16	gi 999000013; gi 312283590	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries]
Y <u>S</u> QNLNQVQSLISNVESQLAEIR	Carbamidomethyl: 3	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
Y <u>S</u> QLSQVQSLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]
Sample 2a 25% stretch -2			
Sequence	Modifications	Accessions	Proteins
SS <u>S</u> CSLSLSSGSR	Carbamidomethyl: 4	gi 359801728	keratin-associated protein KAP13-3 [Ovis aries]
ASSF <u>S</u> CGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

GCGGGSFR	Carbamidomethyl: 2, 4	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
TGPATTI_CSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
VGGSILGCKK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AFSCVSA_CGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
VGGSILGCK	Propionamide: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1; Propionamide: 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 125090; gi 999000014	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
DVD_CAYLR	Carbamidomethyl: 4	gi 246276; gi 312283584	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair keratin type II intermediate filament [Ovis aries]
TGPATTI_CSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGCGYG_CGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]

TGPATTI <u>C</u> SSDKF	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
T <u>C</u> GFSTVGS <u>G</u> FGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
SISTV <u>C</u> QPVGGVSTI <u>C</u> QPT <u>C</u> GVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
ILDELTL <u>C</u> K	Carbamidomethyl: 8	gi 312283590; gi 125090; gi 426238003; gi 999000014	keratin 33B [Ovis aries] RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin PREDICTED: keratin 34 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
YSGSS <u>C</u> GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITP <u>C</u> ISSP <u>C</u> APAAP <u>C</u> TP <u>C</u> VPR	Carbamidomethyl: 5, 10, 16, 19	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
QIASGPVATGGSITVLAPD <u>S</u> CQPR	Carbamidomethyl: 21	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SGQSLSFQPT <u>C</u> GSFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
<u>C</u> CESNLEPLFNGYIETLRR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
Q <u>C</u> CESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
Sample 2a 25% stretch -3			
Sequence	Modifications	Accessions	Proteins
SSS <u>C</u> SSLSSGSR	Carbamidomethyl: 4	gi 999000017	KAP 13.1 var1 (tentative) cs39 [Ovis aries]
ASSF <u>S</u> C <u>G</u> SSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
GIS <u>C</u> YR	Carbamidomethyl: 4	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TYQQS <u>C</u> VSS <u>C</u> R	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SVC <u>G</u> GFR	Carbamidomethyl: 3	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
<u>C</u> G <u>P</u> CNSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
TGPATTI <u>C</u> SSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
VGG <u>S</u> ILG <u>C</u> KK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
LG <u>C</u> GS <u>G</u> FR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SRFGP <u>C</u> NTSG <u>C</u>	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]

SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TRCGPCNTFVH	Carbamidomethyl: 3, 6	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
VGGILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
LGGYGCYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
VGGILGCK	Propionamide: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
TGCFSTVSGFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSACGPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYRGISCYR	Carbamidomethyl: 1, 2, 13	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
RCGFSSFY	Carbamidomethyl: 2	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
SISTVCQPVGGVSTICQPTCGVSR	Carbamidomethyl: 6, 16, 20	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SGQSLFQPTCGSGFY	Carbamidomethyl: 11	gi 426217167	PREDICTED: keratin-associated protein 13-1-like [Ovis aries]
Sample 2a 25% stretch -4			
Sequence	Modifications	Accessions	Proteins
EAECAEADSGR	Carbamidomethyl: 4	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
ASSFCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

TYQQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAYVR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
AFSCVSACGPR	Carbamidomethyl: 4, 8	gi 1308; gi 312283588	hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 125090	RecName: Full=Keratin, type I microfibillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
DVDCAYLR	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 246276	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
ARLECEINTYR	Carbamidomethyl: 5	gi 125090	RecName: Full=Keratin, type I microfibillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
LCEGVGSVNVCVSSSR	Carbamidomethyl: 2, 11	gi 1308; gi 246276	hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TCGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
LCEGVGAVNVCVSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]

QDMA <u>C</u> LLK	Carbamidomethyl: 5	gi 312283584; gi 1308; gi 312283588; gi 246276	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
ILDELT <u>L</u> CK	Carbamidomethyl: 8	gi 125090; gi 312283590; gi 426238003	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries] PREDICTED: keratin 34 [Ovis aries]
YSGSS <u>C</u> GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
VESLKEEL <u>I</u> CLK	Carbamidomethyl: 10	gi 125090; gi 312283590	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries]
VESLKEEL <u>L</u> CLK	Carbamidomethyl: 10	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
DLNMD <u>C</u> VVAEIK	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
Q <u>C</u> CESNLEPLFSGYIETLR	Carbamidomethyl: 2, 3	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
SDLEAQVESLKEEL <u>I</u> CLK	Carbamidomethyl: 16	gi 125090; gi 312283590	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries]
SDLEAQVESLKEEL <u>L</u> CLK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
Y <u>S</u> QLNQVQSLISNVESQLAEIR	Carbamidomethyl: 3	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
Y <u>S</u> QLSQVQSLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]
Sample 2a 25% stretch -5			
Sequence	Modifications	Accessions	Proteins
ASSF <u>S</u> CGSSR	Carbamidomethyl: 6	gi 125117; gi 164652870	RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]
EAE <u>C</u> VEADSGR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
TYQQ <u>S</u> CVSS <u>C</u> R	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
<u>C</u> TRPI <u>C</u> EP <u>C</u> R	Carbamidomethyl: 1, 6, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
SS <u>C</u> SSRP <u>C</u> VPSS <u>C</u> R	Carbamidomethyl: 3, 8, 13	gi 309323371	keratin 34 [Ovis aries]
LG <u>C</u> GSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]

CGPCNSYVR	Carbamidomethyl: 1, 4	gi 164652864	keratin 31 [Ovis aries]
SLGSGYGCGR	Carbamidomethyl: 3, 9	gi 224555998	keratin associated protein 6 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
AFSCVSACGPR	Carbamidomethyl: 4, 8	gi 312283588; gi 1308	keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588; gi 1308	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 164652864; gi 999000014	keratin 31 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
ARLECEINTYR	Carbamidomethyl: 5	gi 164652864; gi 999000014	keratin 31 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117; gi 164652870	RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]
DVDCAYLR	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 125117; gi 164652870	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]
LGCGYGCYGYGSR	Carbamidomethyl: 3, 7	gi 224555998	keratin associated protein 6 [Ovis aries]
LPSNPCATTNASSNFCR	Carbamidomethyl: 6, 16	gi 309323371	keratin 34 [Ovis aries]
NLEIDPNAQCVK	Carbamidomethyl: 10	gi 312283584; gi 312283588; gi 1308; gi 125117	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
QDMACLK	Carbamidomethyl: 5	gi 312283584; gi 312283588; gi 1308; gi 125117; gi 164652870	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]

T_CGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSA_CGPR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
C_DSDILPLR	Carbamidomethyl: 1	gi 999000051	Leucine Rich Repeat Containing 15 Partial (tentative) cs39 [Ovis aries]
L_CEGVGAVNV_CVSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
ILDELT_LCK	Carbamidomethyl: 8	gi 164652864; gi 309323371; gi 312283590; gi 999000014	keratin 31 [Ovis aries] keratin 34 [Ovis aries] keratin 33B [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
ILDDLTL_LCK	Carbamidomethyl: 8	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
YSGSS_CGSSFPNLYVR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
VESLKEELI_CCLK	Carbamidomethyl: 10	gi 164652864; gi 312283590; gi 999000014	keratin 31 [Ovis aries] keratin 33B [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
VESLKEELL_CCLK	Carbamidomethyl: 10	gi 309323371; gi 168693435	keratin 34 [Ovis aries] keratin, type I cuticular Ha5 [Ovis aries]
PLTFISSG_CQPLSGVSTV_CKPVVR	Carbamidomethyl: 9, 19	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
SGQSLSFQPT_CGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
DLNMD_CVVAEIK	Carbamidomethyl: 6	gi 125117; gi 164652870	RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]
DLNMD_CIVAIEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
Q_CCESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
C_CCESNLEPLFNGYIETLR	Carbamidomethyl: 1, 2	gi 125117; gi 164652870	RecName: Full=Keratin, type II microfibrillar, component 5 keratin 85 [Ovis aries]
Q_CCESNLEPLFSGYIETLR	Carbamidomethyl: 2, 3	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
Q_CCESNLEPLFEGYIETLR	Carbamidomethyl: 2, 3	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELI_CCLK	Carbamidomethyl: 16	gi 164652864; gi 312283590	keratin 31 [Ovis aries] keratin 33B [Ovis aries]
SDLEAQVESLKEELL_CCLK	Carbamidomethyl: 16	gi 309323371	keratin 34 [Ovis aries]
ADLEAQVESLKEELL_CCLK	Carbamidomethyl: 16	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
YSCQLNQVQSLISNVESQLAEIR	Carbamidomethyl: 3	gi 164652864	keratin 31 [Ovis aries]
YSCQLSQVQSLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]

Supplementary Table 5 - Sample 2b

Supplementary Table 5

Sample 2b stretch to break -1			
Sequence	Modifications	Accessions	Proteins
ASSFSCGSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
VGGSLGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
LGCYGCYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
TGCFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
SGQSLFQPTCGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Sample 2b stretch to break -2			
Sequence	Modifications	Accessions	Proteins
ASSFSCGSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
TGPATTICSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
SRFGPCNTSGC	Carbamidomethyl: 6, 11	gi 312283590	keratin 33B [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
TRCGPCNTFVH	Carbamidomethyl: 3, 6	gi 312283592	keratin 33 [Ovis aries]

TFSSCSAVAPK	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
SLCGSGYGYGSR	Carbamidomethyl: 3	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 312283592	keratin 33 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1; Propionamide: 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
TCGFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
CCITAAPYRGISCYR	Carbamidomethyl: 1, 2, 13	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
YSGSSCGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
SGQSLSFQPTCGSGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
Sample 2b stretch to break -3			
Sequence	Modifications	Accessions	Proteins
EAECAEADSGR	Carbamidomethyl: 4	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
CPSSFGR	Carbamidomethyl: 1	gi 999000016	KAP 19.3 (tentative) cs39 [Ovis aries]
EAEQVEADSGR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]

CCISAAPYR	Carbamidomethyl: 1, 2	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 125117	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5
LPSNPCATTNASSNFCR	Carbamidomethyl: 6, 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
QDMACLK	Carbamidomethyl: 5	gi 312283584; gi 1308; gi 125117; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] RecName: Full=Keratin, type II microfibrillar, component 5 keratin 83 [Ovis aries]
TGCFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
ILDELTCLK	Carbamidomethyl: 8	gi 426238003; gi 312283590; gi 999000013	PREDICTED: keratin 34 [Ovis aries] keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
YSGSSCGSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
DLNMDCVVAEIK	Carbamidomethyl: 6	gi 125117	RecName: Full=Keratin, type II microfibrillar, component 5
DLNMDCIVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELCLK	Carbamidomethyl: 16	gi 312283590; gi 999000013	keratin 33B [Ovis aries] IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SDLEAQVESLKEELLCLK	Carbamidomethyl: 16	gi 426238003	PREDICTED: keratin 34 [Ovis aries]
ADLEAQVESLKEELLCLK	Carbamidomethyl: 16	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
YSCQLNQVQSLISNVESQLAEIR	Carbamidomethyl: 3	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
YSCQLSQVQSLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]
Sample 2b stretch to break -4			
Sequence	Modifications	Accessions	Proteins
EAECAEADSGR	Carbamidomethyl: 4	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
ASSFSCGSSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

PTSCQPAPCR	Carbamidomethyl: 4, 9	gi 999000041	KAP 2.3 var2 (tentative) cs39 [Ovis aries]
EAECEADSGR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
SSCSSRPCVPSSCR	Carbamidomethyl: 3, 8, 13	gi 309323371	keratin 34 [Ovis aries]
LGCGSGFR	Carbamidomethyl: 3	gi 999000015	KAP 19.5 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAAYVR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
AFSCVSACGPRPGR	Carbamidomethyl: 4, 8	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
VGGSilGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CGPCNTFVH	Carbamidomethyl: 1, 4	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
TQTVVSSPCQTSYRPR	Carbamidomethyl: 9, 13	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
AFSCVSACGPR	Carbamidomethyl: 4, 8	gi 1308; gi 312283588	hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 999000013; gi 999000014	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
GGVACGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 246276; gi 1308	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries]
ARLECEINTYR	Carbamidomethyl: 5	gi 999000013; gi 999000014	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
QDMACLKK	Carbamidomethyl: 5	gi 312283584; gi 246276; gi 1308; gi 312283588	hair keratin type II intermediate filament [Ovis aries] type II intermediate-filament protein

			component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries] keratin 83 [Ovis aries]
AVPAFSCVSA ^C GPRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
T ^C GFSTVGS ^G FGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSCVSA ^C GPR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
L ^C EGVGSVNV ^C VSSSR	Carbamidomethyl: 2, 11	gi 246276; gi 1308	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] hair type II keratin intermediate filament protein [Ovis aries]
L ^C EGVGAVNV ^C VSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
ILDDLTL ^C K	Carbamidomethyl: 8	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
ILDELT ^C K	Carbamidomethyl: 8	gi 999000013; gi 312283590; gi 309323371; gi 999000014	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries] keratin 34 [Ovis aries] IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
YSGSS ^C GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
TITPC ^I SSPC ^A AP ^A CTPC ^V PR	Carbamidomethyl: 5, 10, 16, 19	gi 999000013	IFP Type I K31 var1 (tentative) cs39 [Ovis aries]
SQQQE ^L LLCPNYQSYFR	Carbamidomethyl: 9	gi 309323371	keratin 34 [Ovis aries]
DLNMD ^C VVAEIK	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DLNMD ^C VVAEIK	Propionamide: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
QCCESNLEPLFEGYIETLRR	Carbamidomethyl: 2, 3	gi 312283588	keratin 83 [Ovis aries]
SDLEAQVESLKEELL ^C LK	Carbamidomethyl: 16	gi 309323371	keratin 34 [Ovis aries]
SDLEAQVESLKEELI ^C LK	Carbamidomethyl: 16	gi 999000013; gi 312283590	IFP Type I K31 var1 (tentative) cs39 [Ovis aries] keratin 33B [Ovis aries]
ADLEAQVESLKEELL ^C LK	Carbamidomethyl: 16	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
YSC ^L QLSQVQLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]
YSC ^L QLNQVQLIVSVESQLAEIR	Carbamidomethyl: 3	gi 999000014	IFP Type I K33a var1 (tentative) cs39 [Ovis aries]
Sample 2b stretch to break -5			
Sequence	Modifications	Accessions	Proteins
ASSFSC ^G SSR	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]

EAEQVEADSGR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
SVCGGFR	Carbamidomethyl: 3	gi 312283584; gi 312283588; gi 1308; gi 426226636	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] PREDICTED: keratin, type II cuticular Hb3-like [Ovis aries]
TYQSCVSSCR	Carbamidomethyl: 6, 10	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
CGPCNSYVR	Carbamidomethyl: 1, 4	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
TGPATTICSSDK	Carbamidomethyl: 8	gi 229307	keratin SCMKIIB2
SVSALGSCGPR	Carbamidomethyl: 8	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
TFSSCSAVAPK	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DVDCAAYVR	Carbamidomethyl: 4	gi 312283588	keratin 83 [Ovis aries]
VGGSILGCK	Carbamidomethyl: 8	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
CCISAAPYR	Carbamidomethyl: 1, 2	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
CCITAAPYR	Carbamidomethyl: 1, 2	gi 312283584; gi 312283588; gi 1308; gi 426226636	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] PREDICTED: keratin, type II cuticular Hb3-like [Ovis aries]
AFSCVSACGPR	Carbamidomethyl: 4, 8	gi 312283588; gi 1308; gi 426226636	keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] PREDICTED: keratin, type II cuticular Hb3-like [Ovis aries]
LECEINTYR	Carbamidomethyl: 3	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
TGPATTICSSDKFCR	Carbamidomethyl: 8, 14	gi 229307	keratin SCMKIIB2
GGVACGGGLTYSSTAGR	Carbamidomethyl: 5	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
ARLECEINTYR	Carbamidomethyl: 5	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
DVDCAYLRL	Carbamidomethyl: 4	gi 312283584; gi 1308; gi 246276	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-

			filament protein component 5 [sheep, wool, Peptide, 503 aa]
LGCGYGCGYGYGSR	Carbamidomethyl: 3, 7	gi 999000021	KAP 6.1 (tentative) cs39 [Ovis aries]
SFSA _C SVGLGK	Carbamidomethyl: 5	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
QDMA _C LLK	Carbamidomethyl: 5	gi 312283584; gi 312283588; gi 1308; gi 246276; gi 426226636	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries] type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa] PREDICTED: keratin, type II cuticular Hb3-like [Ovis aries]
AVPAFSC _V SAC _G PRPGR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
T _C GFSTVGSFGSR	Carbamidomethyl: 2	gi 312283588	keratin 83 [Ovis aries]
AVPAFSC _V SAC _G PR	Carbamidomethyl: 7, 11	gi 312283584	hair keratin type II intermediate filament [Ovis aries]
L _C EGVGAVNV _C VSSSR	Carbamidomethyl: 2, 11	gi 312283584; gi 312283588	hair keratin type II intermediate filament [Ovis aries] keratin 83 [Ovis aries]
RILDELTL _C K	Carbamidomethyl: 9	gi 125090; gi 312283590; gi 309323371	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries] keratin 34 [Ovis aries]
ILDDLTL _C K	Carbamidomethyl: 8	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
ILDELTL _C K	Carbamidomethyl: 8	gi 125090; gi 312283590; gi 309323371	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries] keratin 34 [Ovis aries]
YSGSS _C GSSFPSNLVYR	Carbamidomethyl: 6	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
VESLKEELI _C LK	Carbamidomethyl: 10	gi 125090; gi 312283590	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries]
VESLKEELL _C LK	Carbamidomethyl: 10	gi 309323371; gi 168693435	keratin 34 [Ovis aries] keratin, type I cuticular Ha5 [Ovis aries]
SGQSLSFQPT _C SGGFY	Carbamidomethyl: 11	gi 999000030	KAP 13.1 (tentative) cs39 [Ovis aries]
PLTFISSG _C QPLSGVSTV _C KPVR	Carbamidomethyl: 9, 19	gi 999000018	KAP 11.1 (tentative) cs39 [Ovis aries]
DLNMD _C VVAEIK	Carbamidomethyl: 6	gi 246276	type II intermediate-filament protein component 5 [sheep, wool, Peptide, 503 aa]
DLNMD _C IVAEIK	Carbamidomethyl: 6	gi 312283588	keratin 83 [Ovis aries]

QCCESNLEPLFSGYIETLRR	Carbamidomethyl: 2, 3	gi 312283584; gi 1308	hair keratin type II intermediate filament [Ovis aries] hair type II keratin intermediate filament protein [Ovis aries]
SDLEAQVESLKEELI ¹⁶ CLK	Carbamidomethyl: 16	gi 125090; gi 312283590	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin keratin 33B [Ovis aries]
SDLEAQVESLKEELL ¹⁶ CLK	Carbamidomethyl: 16	gi 309323371	keratin 34 [Ovis aries]
QCCESNLEPLFEGYIETLR	Carbamidomethyl: 2, 3	gi 312283588	keratin 83 [Ovis aries]
ADLEAQVESLKEELL ¹⁶ CLK	Carbamidomethyl: 16	gi 168693435	keratin, type I cuticular Ha5 [Ovis aries]
YSCQLNQVQSLISNVESQLAEIR	Carbamidomethyl: 3	gi 125090	RecName: Full=Keratin, type I microfibrillar 48 kDa, component 8C-1; AltName: Full=Low-sulfur keratin
YSCQLSQVQSLIVNVESQLAEIR	Carbamidomethyl: 3	gi 312283590	keratin 33B [Ovis aries]

Coloured version of summary Table 2

Peptides from which consistently labelled cysteines were detected in one or more of the 5 repeats of a treatment condition. Green shading indicates a statistical likelihood (*, P<0.05; ** P<0.01; *** P<0.001) that labelling is a consistent effect of the treatment. Identified proteins from which peptides arise are highlighted as either keratins (blue) or KAPs (orange).

Supplementary Table 6

Sequence	Significance/conditions				Protein ID	Position	Region
	Wet		Dry (55% RH)				
	1a hold	1b break	2a hold	2b break			
A. Cysteines consistently labelled irrespective of conditions							
A ⁴⁸⁹ SSFSCGSSR	5***	4**	5***	5***	K85	T-65	Tail domain
C ³¹ CISAAPYR	5***	5***	4**	3*	K85	H-31, H-32	Head domain
B. Cysteines consistently labelled when wet (hydrogen bonds disrupted)							
T ¹² GPATTICSSDKFCR	5***	4**	2	2	KAP3.2	19, 25	Close to N-terminus
S ⁹⁸ SSCSSLSSGSR	4**	3*	2		KAP13.1 var1	102	In the middle (protein is 166 residues long)
G ²⁵ CGCGSFR	5***	3*	1		KAP19.5	26, 28	In the middle (protein is 72 residues long)
T ³⁸⁰ ITPCISSPCAPAAPCTPCVPR	5***	5***	1	1	K31	T-22, T-27, T-33, T-36	Close to C-terminus
S ³⁹⁴ RFGPCNTSGC	5***	3*	2	1	K33b	T-37, T-42	C-terminal peptide
S ⁵³ VCGGFR	4**	3*	2	2	K83	H-55	Head domain
V ⁴⁹² GGSilGCKK	5***	5***	2		K86-like	T-70	C-terminus but one, terminal cysteine
C. Cysteines consistently labelled when wet and stretched and held only							
L ¹²⁵ GYGICGFPVLSSGSGFCQPTFFASR	4**				KAP13.1 var1	130	Close to the C-terminus (protein is 166 residues long)
T ¹²⁴ FRTSPCC	3*	2			KAP2.3 var3	130, 131	C-terminal peptide
T ¹² GPATTICSSDKF	3*		1		KAP3.2	19	Close to N-terminus
D. Cysteines consistently labelled only in dry condition (reinforcing hydrogen bonds present)							
Y ³⁰⁶ SCQLSQVQLIVNVESQLAEIR			3*	3*	K31, K33b	2-90	Coil 2B
E. Cysteines consistently labelled when dry and stretched and held only							
V ¹⁷⁹ ESLKEELICLK			3*	1	K31 var1, K33b	1B-87	Coil 1B (Seq. number for K31)
V ¹⁷⁹ ESLKEELLCLK			3*	1	K34	1B-87	Coil 1B
Y ³⁰⁶ SCQLNQVQLISNVESQLAEIR			3*	2	K31, K33b	2-90	Coil 2B
F. Cysteines consistently labelled on prolonged stretching irrespective of water content							
S ¹²¹ ISTVCQPVGGVSTICQPTCGVSR	5***	2	3*		KAP11.1	126, 136, 140	Close to the C-terminus (residue 158)
G. Cysteines consistently labelled only when fibre stretched to break and reinforced by hydrogen bonds							
A ²¹⁴ DLEAQVESLKEELLCLK			1	3*	K35	1B-87	Coil 1B
H. Cysteines consistently labelled when fibre was wet or stretched and held, but not when stretched to break dry							
C ³⁹⁵ GPCNTFVH	3*	3*	3*	2	K33a	T-33, T-36	Tail domain

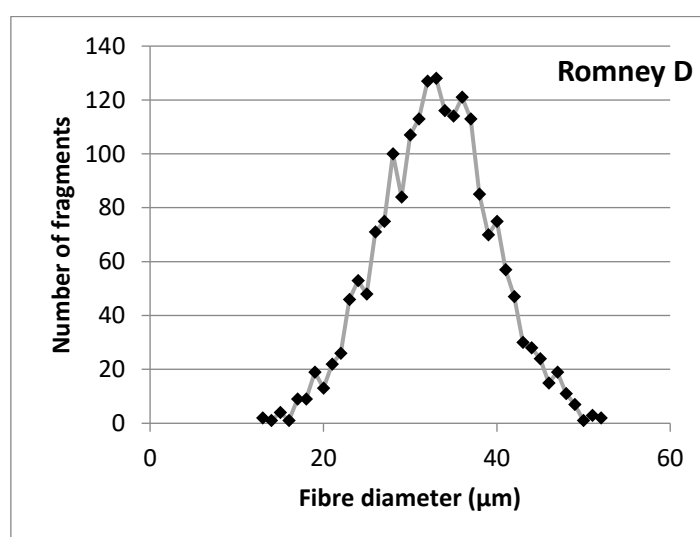
Fibre diameter distribution and other characteristics measured by OFDA method

Romney breed, Barry's Bay Sheep D was selected from wool from 10 sheep in the same flock because of its well-defined narrow distribution of fibre diameters when measured using the industry standard Optical Fibre Diameter Analyser (OFDA) method (Supplementary Supplementary Figure 1 and Supplementary Supplementary Table 7).

The table below contains measurement categories used in the wool industry in New Zealand. The key values for this study are the average fibre diameter (MICRON), standard deviation of the fibre diameter distribution (SD) and the curliness of fibres (CURVE) expressed in degrees of fibre curvature per millimetre.

Supplementary Table 7. OFDA data for wool sample used in this study

SAMPLE ID	Breed	MICRON	SD	CV	CEM	CF	SF	CURVE	BULK
D	Romney	33.02	6.6	19.9	11.48	34.5	31.84	45.9	25.71



Supplementary Figure 1. OFDA diameter distribution of wool fibres from wool sample used in study.

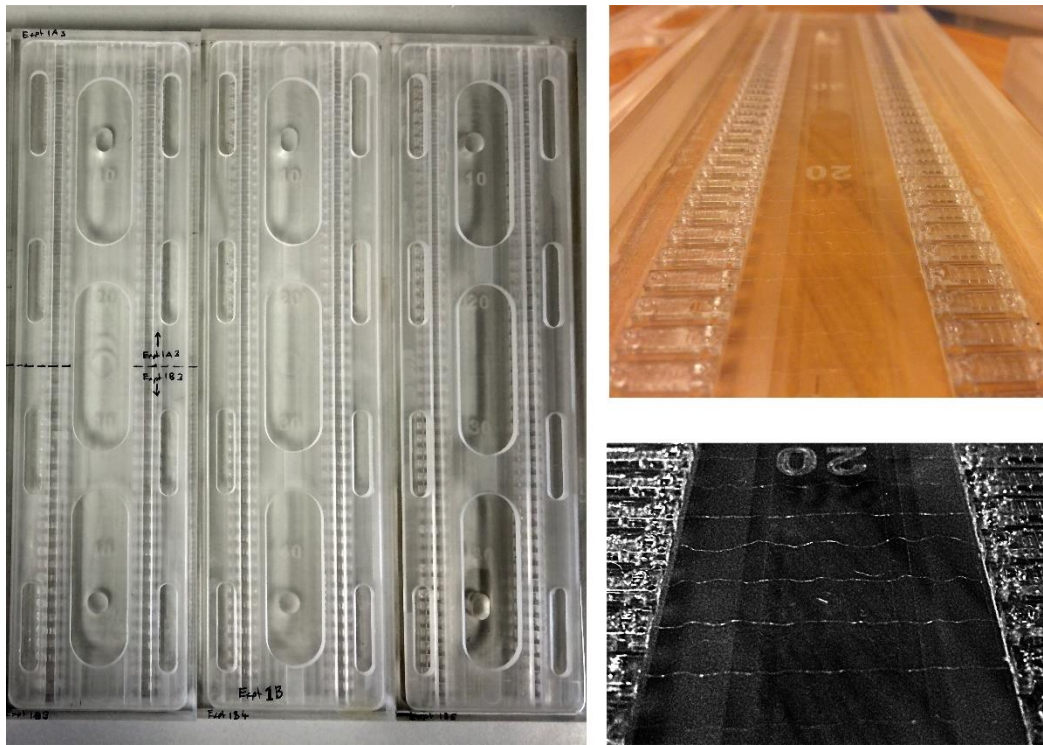
Tensile breakage of single fibres from same sample

Although single fibres were stretched and broken during the study (wet, dry but always with alkylating reagents present), the data from those tests were not reliable because the samples were mounted between plastic clips but stretched in an instrument designed for single fibres stabilised by metal crimps.

Reference data for the tensile properties of a select group of fibres from the Romney D sample is presented here. Two groups of fibres were tested, one containing 50 fibres and effectively a larger replicate of the groups used in the study ($n = 25$) and a second set of 12 fibres which were selected in the same way as other fibres but for which the cross-section of the break surface was measured optically.

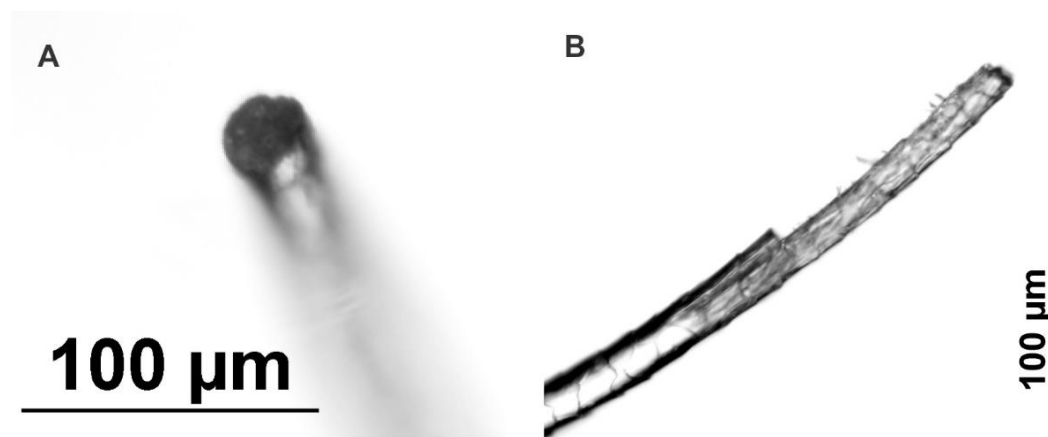
The root-end 30 mm of 50 fibres were individually mounted between pairs of clip-together plastic tabs (Dia-Stron, UK) used to grip the fibres during stretching and further secured

using UV cure glue (Dymax 3094-adhesive) (see main article for details). All the mounted fibres were placed in specially constructed plastic trays (Main article Figure 2 and Supplementary Supplementary Figure 2).



Supplementary Figure 2. Picture of the trays used in the study and insets images showing the arrangement of individual wool fibres.

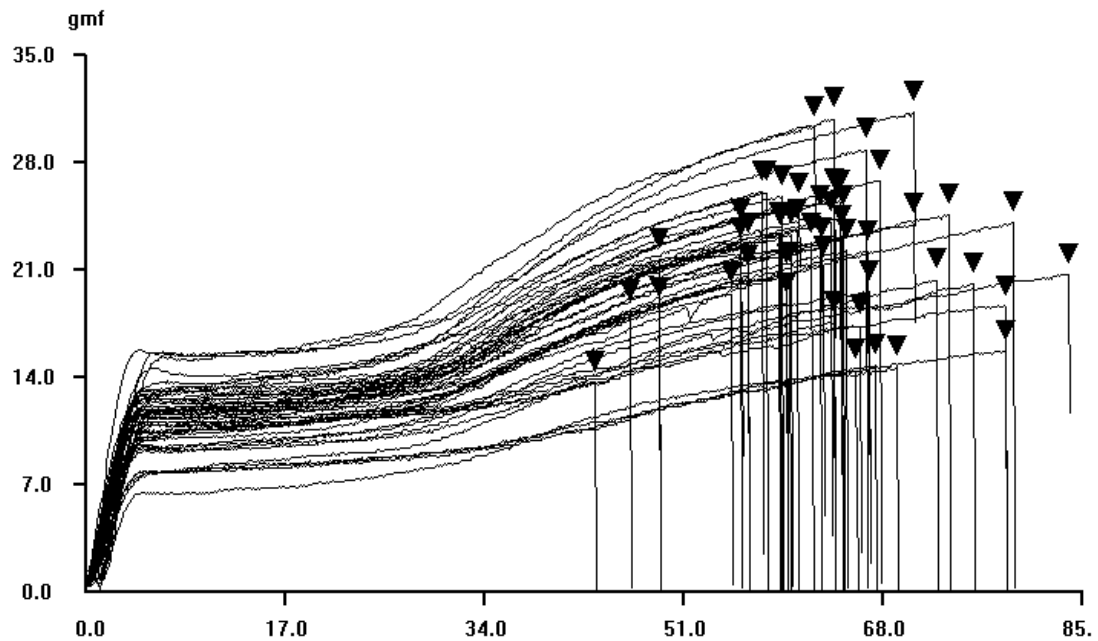
For 12 of the fibres, the broken fibre ends were recovered and imaged end-on under a microscope (Zeiss Standard 14 with an Olympus DP12 digital camera) (Supplementary Figure 3) and the cross-sectional area (CSA) of the break measured (Olympus AnalySIS version 5) along with mean diameter (from 360 diameter measurements taken at 1 degree angles) and aspect ratio (the maximum diameter divided by minimum diameter).



Supplementary Figure 3. Examples of break types. A. Oblique view of clean transverse break. B. Step break, common in dry condition.

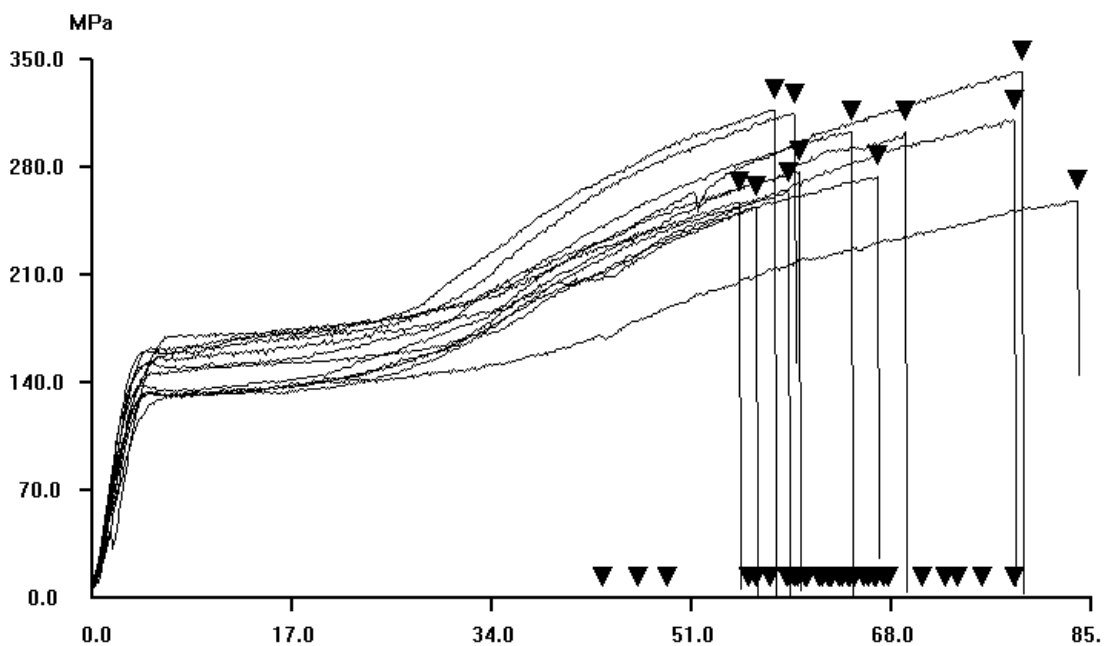
Tensile tests were carried out to failure for each fibre (Dia Stron, UK, LEX820 linear extensometer with an ALS1500 automatic loading system). Data is plotted all fibres (Supplementary Supplementary Figure 4) and as stress/strain plots for the 12 fibres with Cross Sectional area of break surface data (Supplementary Supplementary Figure 5), and all data is summarised (Supplementary Supplementary Table 8).

Description: Slot 1 : LEX Extension Method, Cycle: 1 Romney D



Supplementary Figure 4. Tensile plots of all 50 wool fibres.

Description: Slot 1 : LEX Extension Method, Cycle: 1 Romney D



Supplementary Figure 5. Tensile stress/strain plots for the 12 in which cross-section at break was measured.

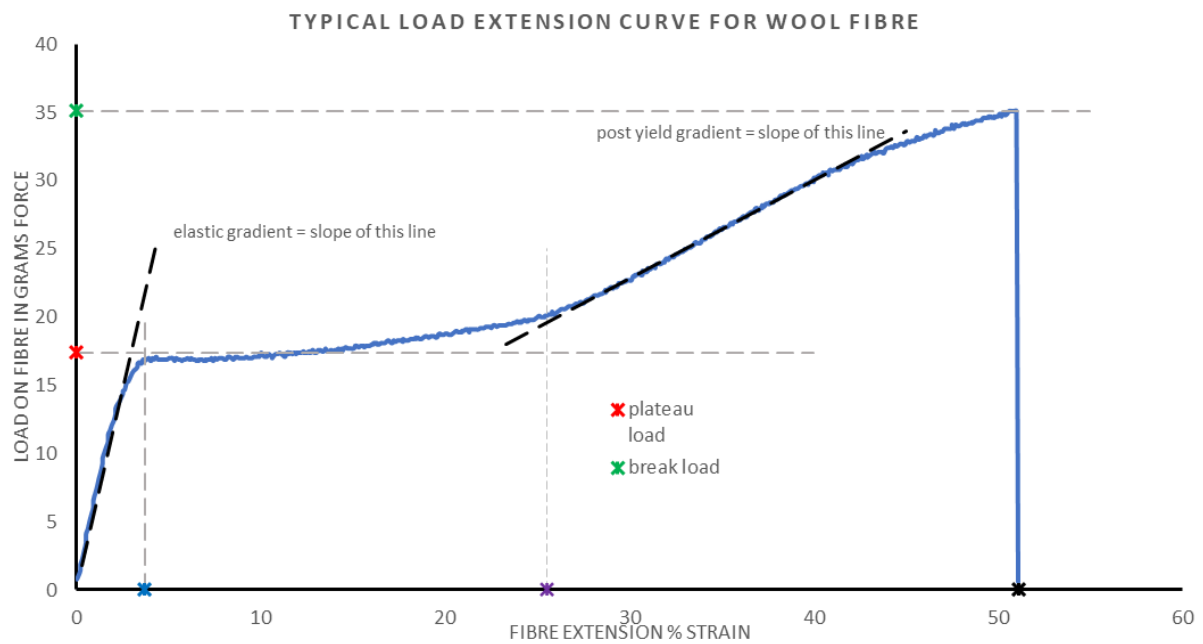
Supplementary Table 8. Tensile data summary from Dia Stron for Romney D with CSA for 12 samples. Note that properties dependent on CSA have only 12 data points whereas others have 50.

	CROSS-SECTIONAL AREA	ELASTIC_EMOD	ELASTIC_GRADIENT	ELASTIC_EXT	PLATEAU_LOAD	PLATEAU_STRESS	LOAD_15%	STRESS_15%	WORK_15%
	sq. microns	N/m2(Pa)	gmf/mm	% Strain	gmf	gmf/sq micron	gmf	gmf/sq micron	Joules
Min:	476.4	2.51E+09	35.4	3.26	7.32	0.0143	6.8	0.0137	3.52E-05
Max:	864.9	4.38E+09	94.5	5.57	16.9	0.019	15.8	0.0177	9.07E-05
Median:	764.55	3.55E+09	64.45	4.13	12.5	0.0162	11.95	0.01565	0.000063
Mean:	713.275	3.56E+09	65.248	4.206	12.2748	0.016325	11.76	0.015633	6.22E-05
Std. Dev.:	128.7361	5.52E+08	12.66066	0.552626	2.066367	0.001647	1.919263	0.001606	1.05E-05
data count	12	12	50	50	50	12	50	12	50

LOAD_25%	STRESS_25%	WORK_25%	YIELD_EXT	POSTYIELD_GRADIENT	BREAK_EXT	BREAK_LOAD	BREAK_STRESS	TOTAL_WORK	TOUGHNESS
gmf	gmf/sq micron	Joules	% Strain	gmf/mm	% Strain	gmf	gmf/sq micron	Joules	Joules/m3
7.65	0.0146	6.53E-05	23.89	3.33	43.49	13.8	0.026	0.000182	94000000
17.1	0.0186	0.000162	44.23	9.97	83.87	31.3	0.035	0.000619	1.81E+08
12.9	0.0167	0.000115	33.73	6.465	63.3	22.65	0.02965	0.000404	1.25E+08
12.646	0.016792	0.000113	33.6606	6.2196	63.3988	22.282	0.029592	0.000398	1.3E+08
2.058825	0.001517	1.9E-05	4.129862	1.497167	8.146724	4.071187	0.002973	9.02E-05	26865298
50	12	50	50	50	50	50	12	50	12

Plot below defines the properties in Supplementary Supplementary Table 8, the most useful of which are listed below in Supplementary Supplementary Figure 6

1. Elastic gradient
2. Post yield gradient
3. Plateau load (or stress if fibre CSA is known)
4. Break load (or stress if fibre CSA is known)
5. Elastic extent (or stress if fibre CSA is known)
6. Break extension (or stress if fibre CSA is known)
7. Yield extent



Supplementary Figure 6. Example data from a typical tensile extension test for a single wool fibre.