'Intentional Genetic Manipulation' as a conservation threat

Conservation Genetics Resources

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Table 1 An illustration of four different colour gene types with examples from horses (*Equus ferus*).

	Locus	Gene	Function	Phenotype
Primary colour	Extension	*MC1R* (melanocortin 1 receptor gene)	Formation of true black pigment	Chestnut (Red)/Non-Red (Black)
Primary colour	Agouti	*ASIP* (agouti signaling protein gene)	Restriction of true black pigment	Black/Bay (only in Non-Red)
Dilution colour coats	Cream (Cr)	*MATP* (membrane associated transport protein gene) or *SCL45A2*	Controls the saturation or dilution of pigment in the coat	Palomino/Buckskin/Smokey black/ Cremello/Perlino/Smokey cream
	Ch	*PAT1* (proton-coupled amino acid transporter 1 gene) or *SLC36A1*	Controls saturation or dilution of pigment but it is not strongly dosage dependent	Champagne
	Dun (D)	Not known	Control saturation or intensity of pigment	Diluted colour without markings
	Z	*PMEL17* (premelanosome protein gene)	Dilutes eumelanin or black pigment	Silver dapple (lightens black hair)
	Pearl (Prl)	*SCL45A2* (solute carrier family 45 member 2 gene) or *MATP*	Recessive dilution gene, additive effect with cream	Very much like Champagne (also known as the barlink factor)
Greying	Grey (G)	*STX17* (syntaxin17 gene)	Progressive silvering with age	Grey
Depigmentation	Roan (Rn)	*KIT* (KIT proto-oncogene receptor tyrosine kinase gene)	White patterns across the body	White hairs to be evenly intermixed within the horse's body colour
	O	*EDNRB* (endothelin receptor type B gene)	White spotting	Irregular white spotting, often horizontal in distribution
	TO	*KIT* (KIT proto-oncogene receptor tyrosine kinase gene)	White spotting	Regular white spotting, often vertical in distribution

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