

Silver and Golden

At least two different genes are suspected of influencing the silver and golden coat colors found in many cat breeds.

Silver (a.k.a. **Inhibitor** (*I,i*)) appears to reduce or eliminate the production of pheomelanin or yellow pigment in the cat's hair. Generally considered a dominant trait, one copy can cause the loss of pigment, but likely a cat with two copies of the mutation may have less "ruffusing" or "tarnishing" as well. On a tabby cat, the black banding will appear but the yellow bands are devoid of coloration (Figure 1). Silver is seen in random bred cats and may be a very ancient mutation, pre-dating the development of breeds and the cat fancy. Many argue as to whether there may be a second – recessive type of silver mutation. I personally do not think this should be ruled out until we prove otherwise, but I think the majority of evidence (or cats) is for a single dominant mutation. There may be more than one mutation, we will see! Cats that are *non-agouti* (*aa*) and are solid, will appear as smokes, with white at the base of the hair when they have the silver mutation. Silver is a novel gene in cats, all the genes that cause silver colorations in other species have been eliminated as the cause.

Wide-band is the trait that affects the length of the band, displayed when the cat is agouti (*AA* or *Aa*). This gene seems to have extensive variation, causing many short bands or a few longer bands. The selection for longer and fewer bandings in the cats' hair is likely due to selection by breeders and is less common in the feral cat population. Cats with extremely long bands appear as chinchilla's when the cats are silver and golden when the cats are non-silver (Figure 2).



Figure 1. Banding (ticking) in cat fur. Left side is my cat Figaro – a normal, wildtype, brown tabby cat with ticked / banded fur. The drawing is the coloration in her fur, alternating bands of yellow (pheomelanin) and black (eumelanin) pigment. Far right is hair that is silver and is depleted of only yellow pigment. These are the effects of only the silver gene. The Silver cat also has a mutation at the gene called *Ticked* which removes the tabby patterns (Tabby Aby, *T^a*).



Figure 2. The effect of the Wide-band locus on cat hair. The *Wide-band* trait is less understood as extreme variation can be seen in the length of the banding in the cats fur. Breeders have selected for extremes, producing the chinchilla (left) and golden cats (right). Golden is the effect of only wide-band while chinchilla is the effect of wide-band and silver. I have no direct breeding evidence of wide-band, but the trait is suspected to be recessive.

Comment pouvez vous aider ?

- Nous avons besoin d'échantillons d'ADN – frottis buccaux, de sang ou de tissus. N'importe quelle source d'ADN sera bonne pour ce projet.
- Silver des chats, surtout si vous pensez avoir des homozygotes.
- Larges bandes : vous cherchez les extrêmes – chinchillas et surtout goldens !
- Envoyez des photos des chats et des pedigrees. Très souvent, il faudra nous renvoyer des images.
- TOUTE PARTICIPATION EST CONFIDENTIELLE.

S'il vous plaît n'envoyez pas d'échantillons dont vous n'êtes pas certains de la couleur, en espérant obtenir une réponse. Nous n'utiliserons pas ces échantillons. Ces projets de recherche ne sont pas un moyen d'obtenir gratuitement l'ADN de vos chats. N'attendez pas de réponse de notre part car nous avons un long chemin à parcourir. Une fois que nous aurons publié un manuscrit au sujet de votre chat, nous pouvons vous fournir le type d'ADN. Mais ne vous attendez pas à des réponses pour prendre des décisions de reproduction, désolé.

Références :

Génétique pour les éleveurs de chat – Roy Robinson, Pergamon Press 3RD Edition

Génétique de Robinson pour chat éleveurs et vétérinaires, Vella, Shelton, McGonagle, Stanglein, Butterworth-Heinemann

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