



**RÉPUBLIQUE
FRANÇAISE**

*Liberté
Égalité
Fraternité*



VetAgro Sup

EXCESSIVE TRAIT & SINGLE MUTATION

- Professor in genetics (2018-) Lyon school of veterinary medicine (VetAgro Sup)
- Associate professor in genetics (2005-) Alfort school of veterinary medicine
- PhD in human genetics (2004)
- Vet diploma (1999)

- Scientific expert for the French Kennel Club (SCC)
- Scientific expert for the French Feline Studbook (LOOF)
- Trainer for breeders and animal registries

- Research topics
 - Inherited diseases in cats, dogs and horses
 - Coat colour in cats and donkeys

- Achievements

Identification of 21 variants for inherited diseases and coat colour in animals

- Cerebellar ataxia (NCL), spinocerebellar ataxia, deafness, dwarfism in dogs
- Myasthenia (CMS), nude syndrome, albinism, Waardenburg syndrome in cats



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There is a need to clarify
the various situations

1) Excessive trait

- Some individuals **within** a population
- Polygenic (or oligogenic) genetic determinism

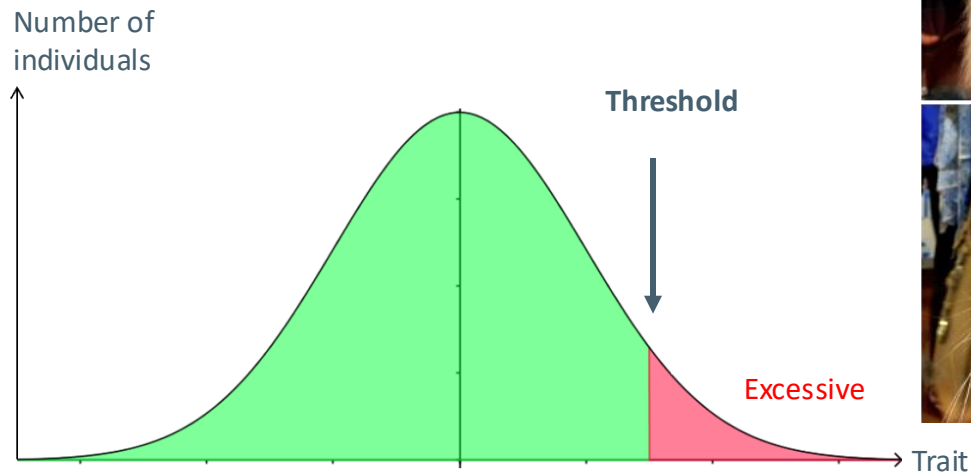
Photos: Marie Abitbol



Photos: Philippe Bossé



Does **extreme conformation** have
an impact on health and welfare?



There is a need to clarify
the various situations

2) Populations defined by a specific trait

- All or almost all individuals from the population
- Simple (monogenic) genetic determinism

Does **the trait** have an impact
on health and welfare?



Photo: Steve Jurvetson

Conformational traits



Photo: public domain



Photo: Barbara Fichter

Coat variations

There is a need to clarify
the various situations

3) New traits

- Selected within a population
- Simple (monogenic) genetic determinism

Does **the trait** have an impact
on health and welfare?



Photo: Pascal Rocques



Photo: Yves Zalenski

New coat/eyes colours



Abitbol et al., 2024, 2026

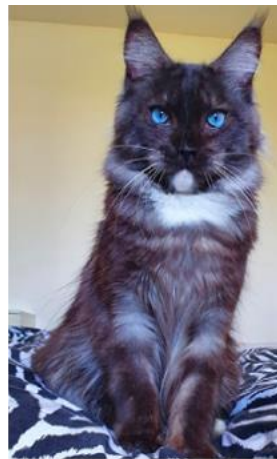


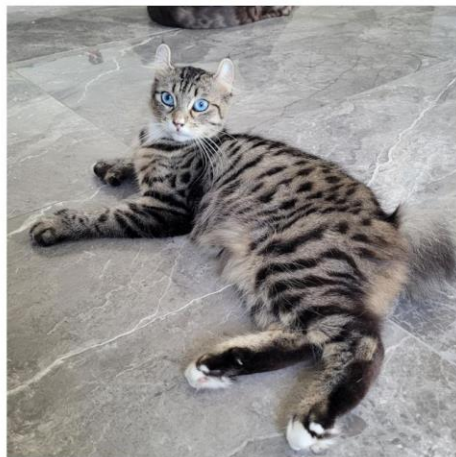
Photo: Helmi Nilsson



Photo: Elizaveta Ljovenko

4) Cross-breeding between individuals exhibiting specific traits

- "Accumulation" of genetic variants in an individual
- Addition of simple traits (cats)
- Addition or mix of oligogenic/polygenic traits (dogs)



Photos - Jake Macmillan, 2021

Four different traits

- ☐ Curl
- ☐ Dominant blue eyes
- ☐ Polydactyly
- ☐ Bobtail

Does the "mix" have an impact
on health and welfare?



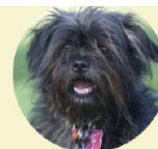
Photo: Pinterest

Three different traits

- ☐ Curl
- ☐ Dwarf
- ☐ Canadian hairless

Designer dogs

Mal-Shi
Maltese / Shih Tzu



Puggle
Beagle / Pug



Schnoodle
Schnauzer / Poodle



<https://dogbreedidentifier.com>

2) Populations defined by a specific trait

1) Excessive trait within a population



Photo: Marie Abitbol



Photo: Philippe Bossé

- Morphological criteria (e.g. position of the nose)
- Imaging (e.g. skull, teeth, tear ducts)
- Functional tests (e.g. breathing)?

Data available
Scientific papers

Next
presentations

Osteochondro
dysplasia



Photo: Steve Jurvetson

- Joint manipulation?
- Imaging?
- Test (e.g. jumping)?

Data available (imaging)

Scientific papers

But there is a discrepancy between
the imaging (X-rays) and mobility/pain

We need to reassess the situation

Whiskers



Photo: Barbara Fichter

- Whiskers' length (threshold)?
- Test (darkness maze test)?

No data
available

To assess the effect, we need scientific data

3) New trait selected within a population



Blood pressure?

BELLE AYR CATS

Blue Eye British Long/Short Hair Maine Coons Therapy Cat Retired Cats Research & Publications
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12 Apr

Exploring Cat Blood Pressure: Testing Across Generations

We set up this project as part of our ongoing passion for animal welfare and our cats' health and well-being.

Corin Levels vs Blood Pressure Trials in British Shorthair/Longhair Cats, Summary Statement

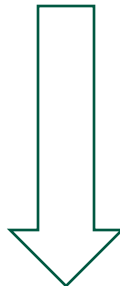
10/9/2024, Kristina Macaulay, Belle Ayr Cats

Purpose:
The trial was proposed by Pr Marie ABITBOL (Séminetique, VetAgro Sup, Campus vétérinaire de Lyon, France) to investigate whether there is a difference in blood pressure between copper cats and non-copper cats.

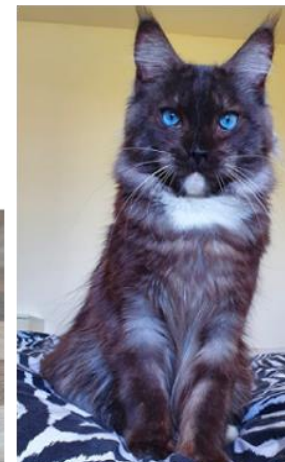
Testing Across Three Generations
To explore this, we tested over 40 cats from three generations of our feline family, representing a wide and diverse sample pool of genealogies. This comprehensive approach allowed us to gain deeper insights into any potential genetic or lifestyle factors that might influence blood pressure health.

Our findings are:
There is no statistical relationship between blood pressure (BP) and the genetic status of cats for the CORIN copper mutation.

No scientific paper available
But data available
➤ other data sources!

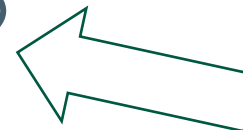


Deafness?



Abitbol et al., 2024, 2026

Data available
Scientific papers
+ other sources!



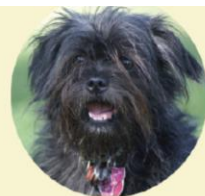
4) Cross-breeding between individuals exhibiting specific traits



No data
available

Mal-Shi

Maltese / Shih Tzu



Puggle

Beagle / Pug



Schnoodle

Schnauzer / Poodle



<https://dogbreedidentifier.com>

+ Additional complexity:
interspecific cross
(hybridisation) and
behavioural issues?



No data
available

It is essential to distinguish between the different situations

- Extreme conformation (polygenic inheritance)
- Traits governed by a single mutation

To assess the effect of a conformation or a trait, we need scientific data

- Data is lacking for many traits
- Scientific studies will need to be carried out
- It may be useful to incorporate data held by studbooks and breeders

The variety of situations makes it difficult to define what 'excessive' is
Each situation must be assessed on a case-by-case basis