



Mutants in Movies

...Mutants in Sports

How do we make sports fair...

...if some athletes are mutants?



"Genetics...is like the beginning of the internet in 1993"

...George Church  
Harvard Medical School

### What is a mutant? .... Animal Mutants

Belgian Blue Cow

Excess muscle  
Little fat  
No hair

...mutant  
...ミュータント



### Same Mutation in Dogs



Normal Whippet



Mutant Whippet

Eero Mantryanta: 1960 -1972

7 Olympic Medals:

- 3 Gold
- 2 Silver
- 2 Bronze



1960 – 1990: suspected of cheating

1990: Genetic Analysis

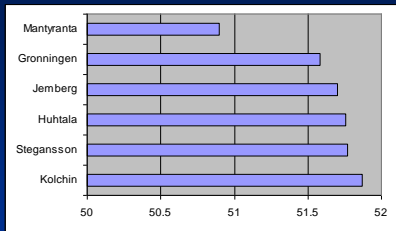
50 of 200 family members...

Mutants: more red blood cells

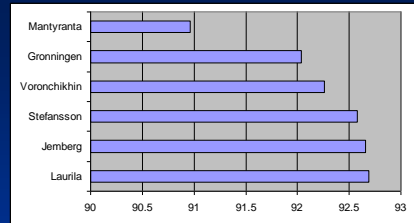


### How far ahead was Mantyranta?

#### 15 Kilometer Race



### 30 Kilometer Race



### Genetic Analysis: Human Mutants 遺伝子分析: 人間ミュータント ACTN3 Gene

	Frequency
Normal	80%
Sprinters	100%
Some female sprinters	2 ACTN3 genes

