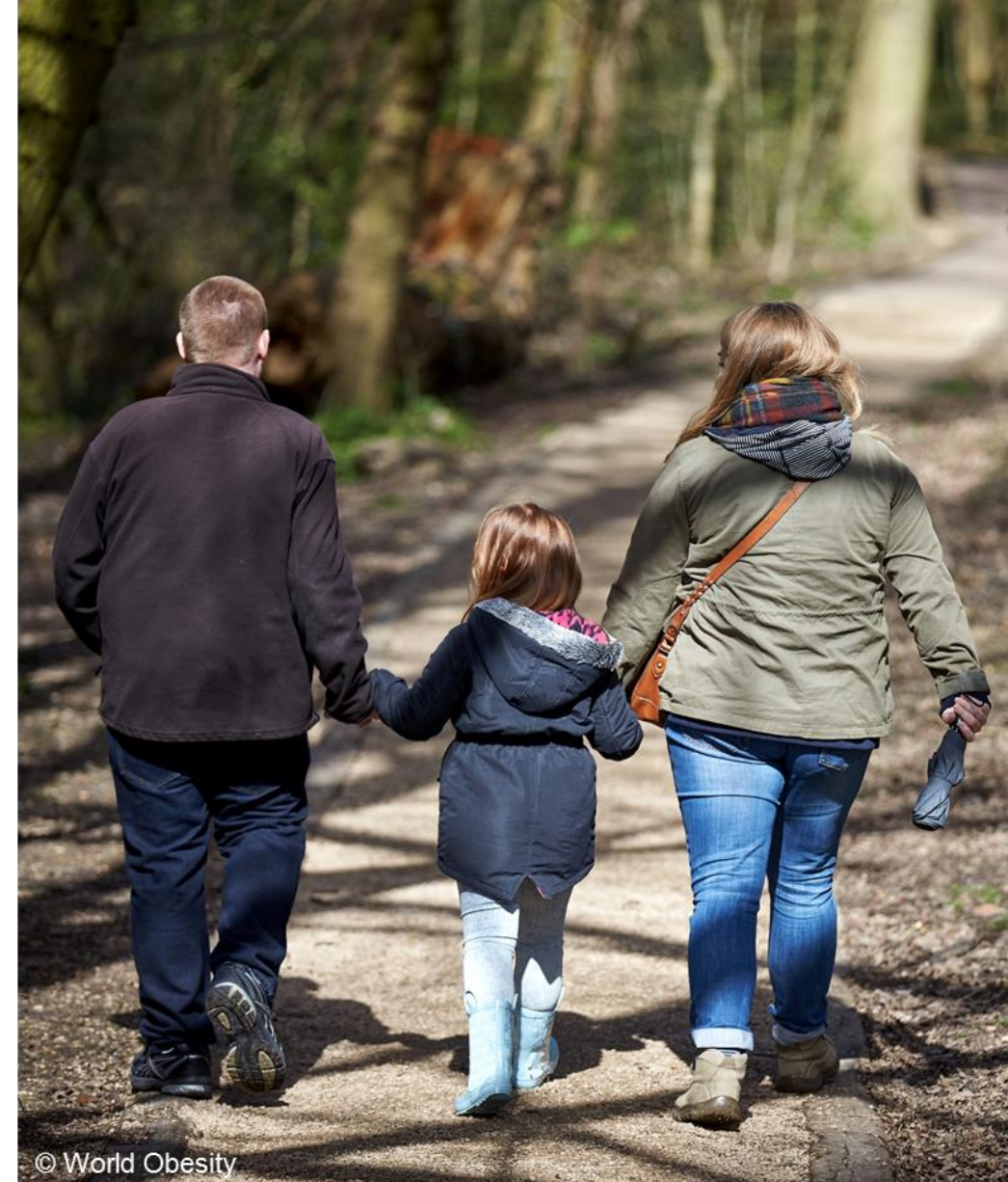


# Are your genes to blame when your jeans don't fit?

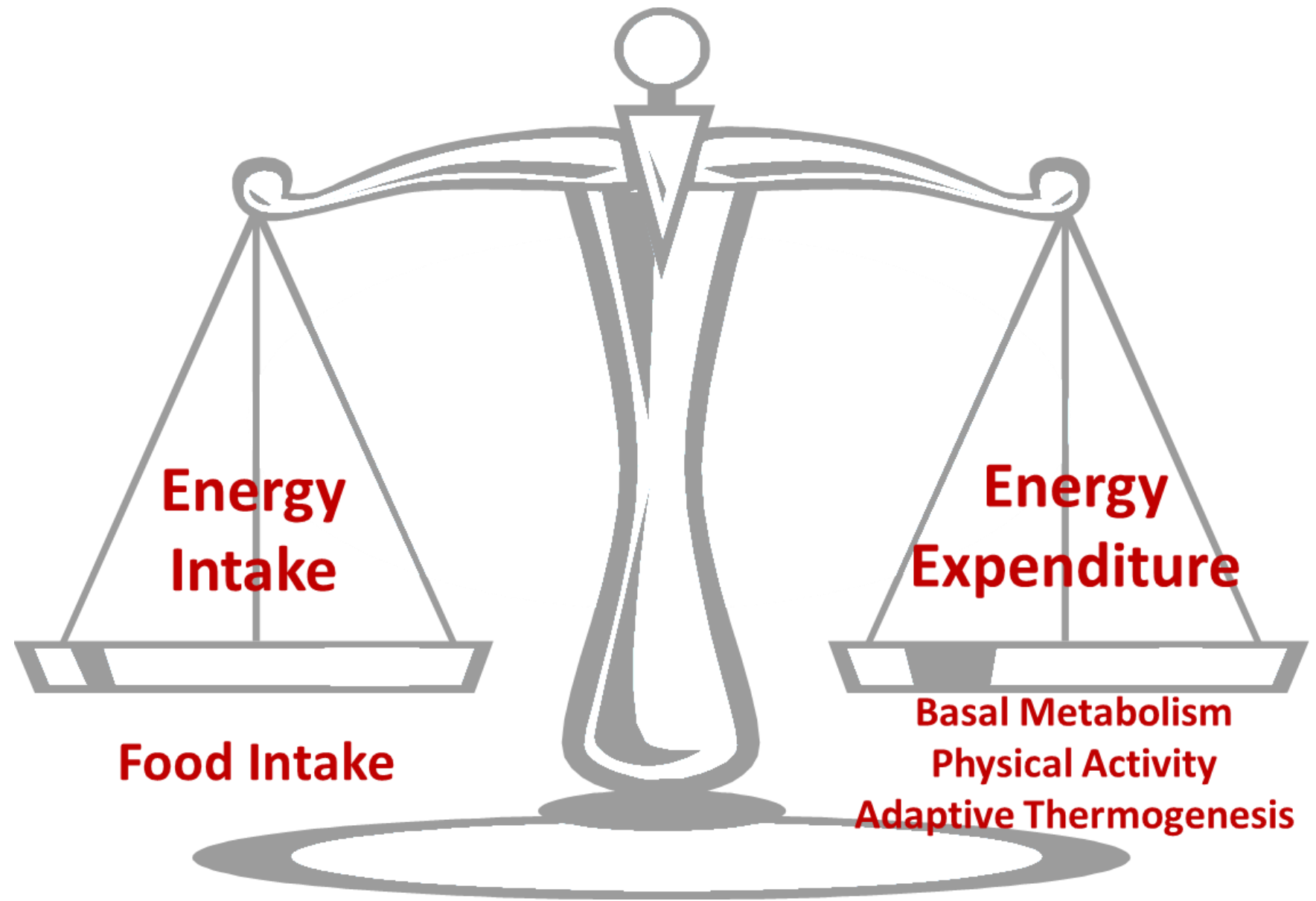
**Giles Yeo**

*gshy2@cam.ac.uk*

 @GilesYeo



# Energy balance



**Energy  
Intake**

**Food Intake**

**Energy  
Expenditure**

**Basal Metabolism  
Physical Activity  
Adaptive Thermogenesis**

# BODY MASS INDEX, FROM 1984 TO 2014

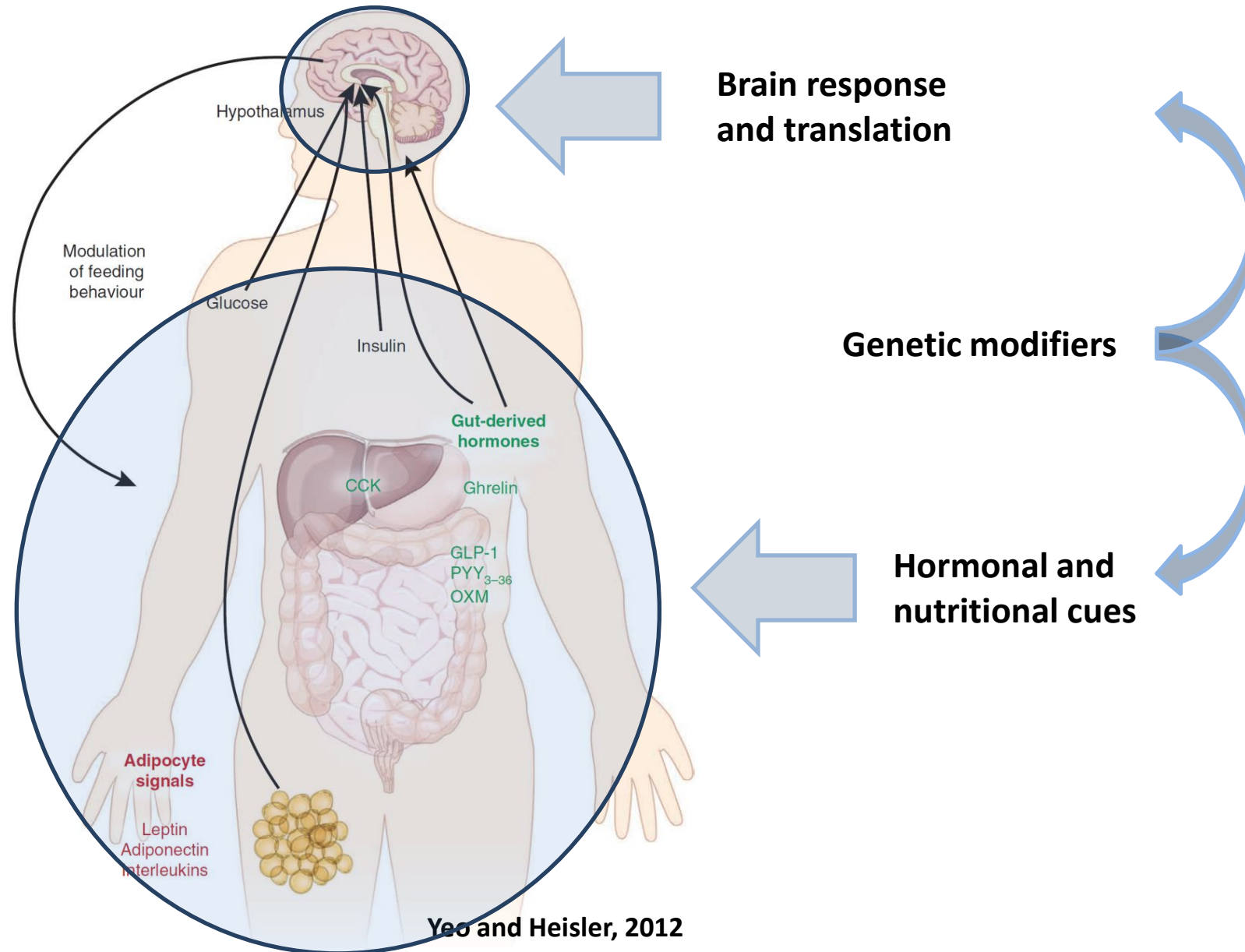


# Twin studies



Heritability of **BODY WEIGHT** ~ 70%

# Brain control of food intake



# Human congenital leptin deficiency



normal birthweight

**hyperphagia** after weaning  
**no food preference**

no defect in BMR or energy  
expenditure

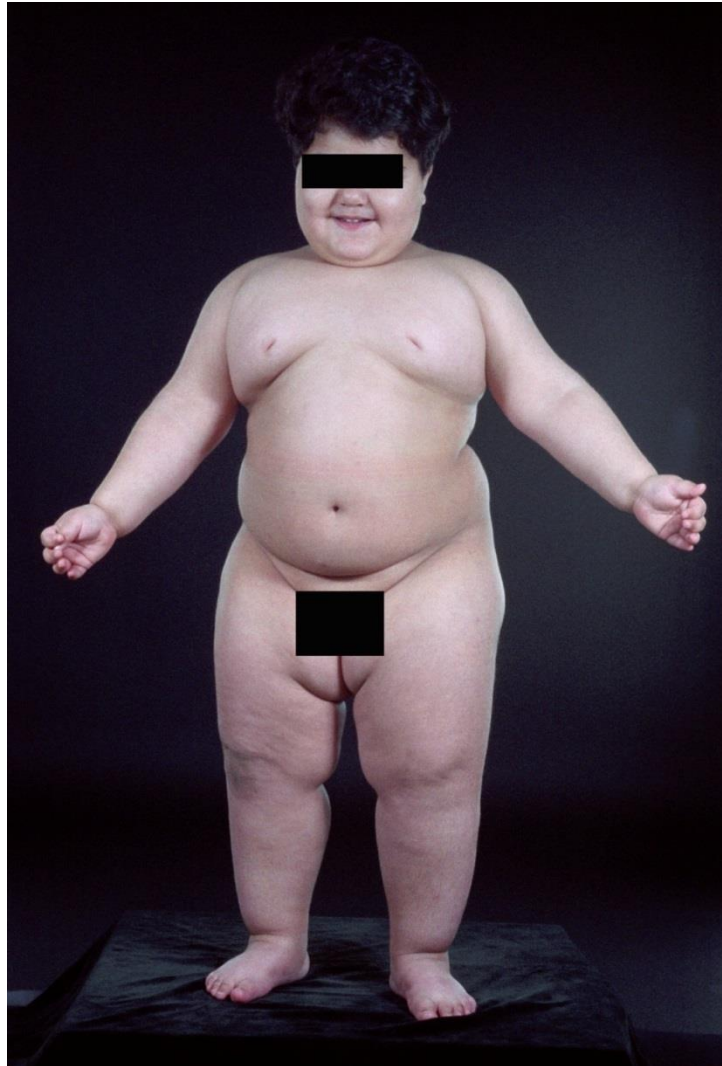
increased fat mass (57%)

normal height

**do not undergo puberty**

**impaired immune function**

# Human congenital leptin deficiency



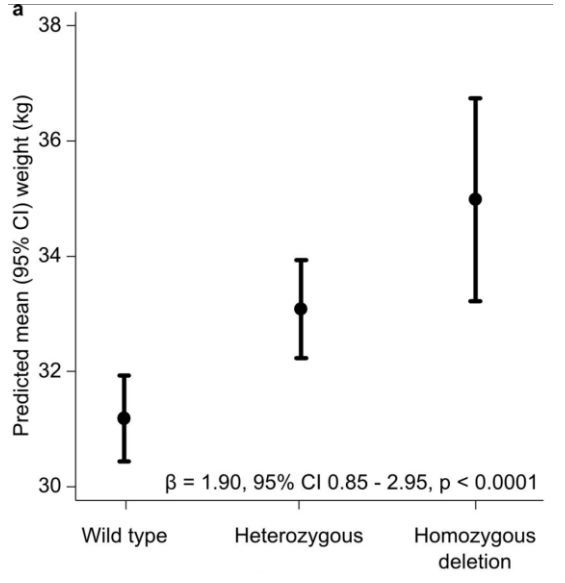
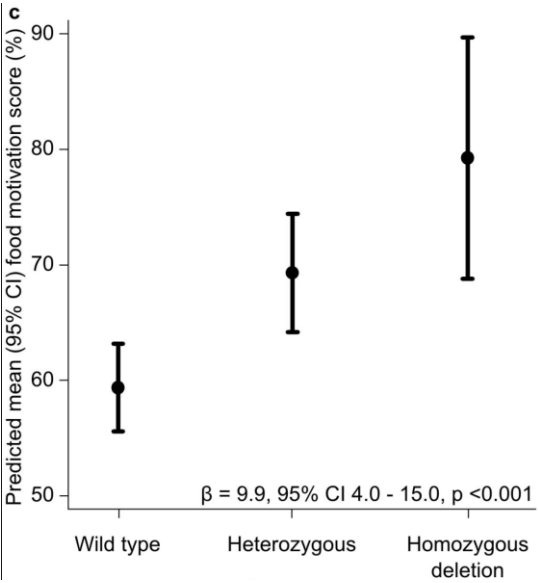
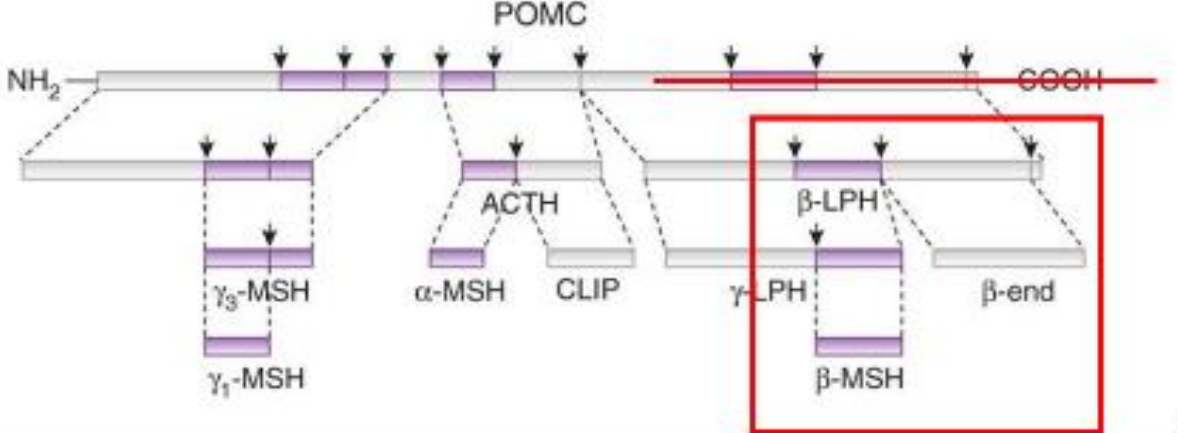
3yr old weighing 42kg

# Daily leptin treatment

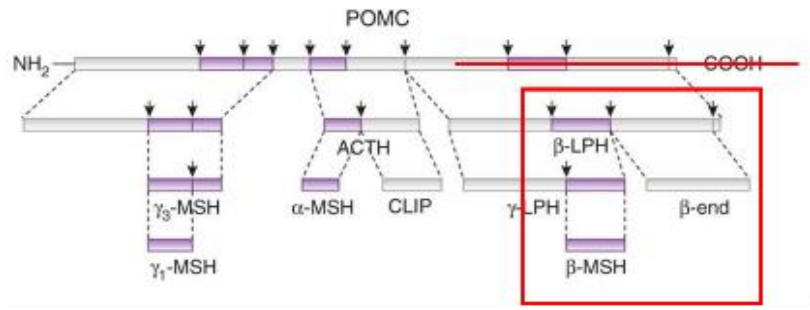


7yr old weighing 32kg

# Labrador retrievers







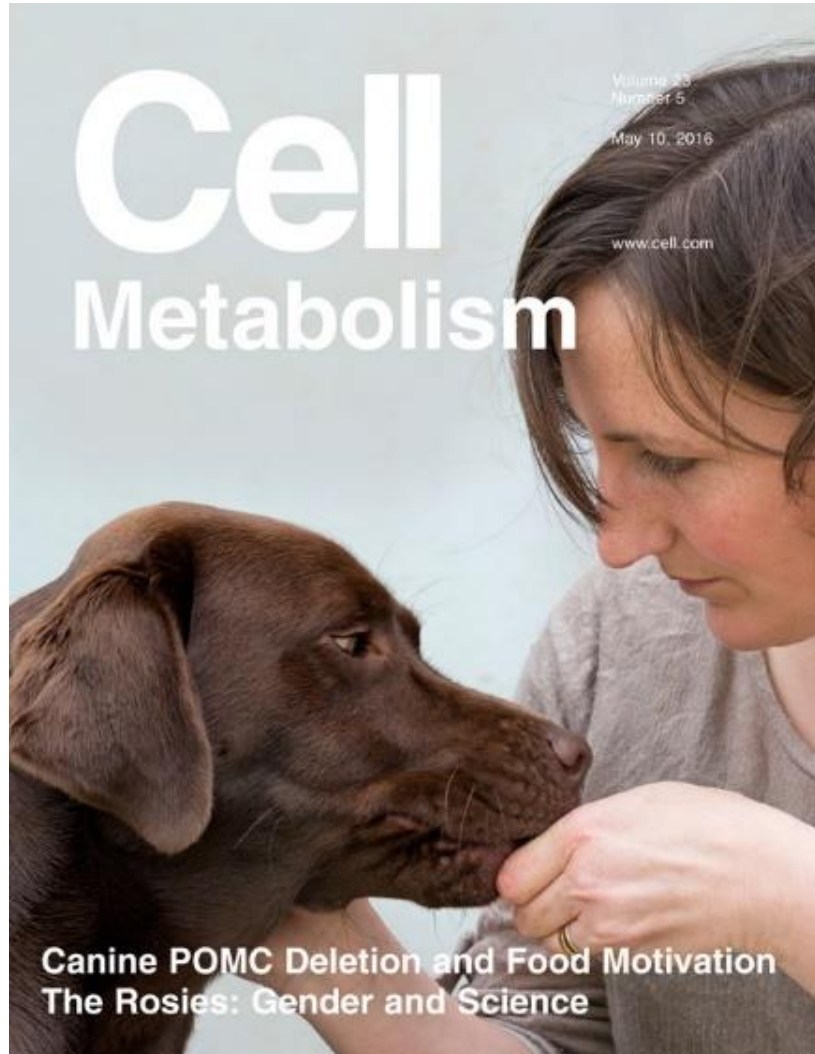
## Prevalence

### All Labradors

WT 78%  
 Hets 20%  
 Homs 2%

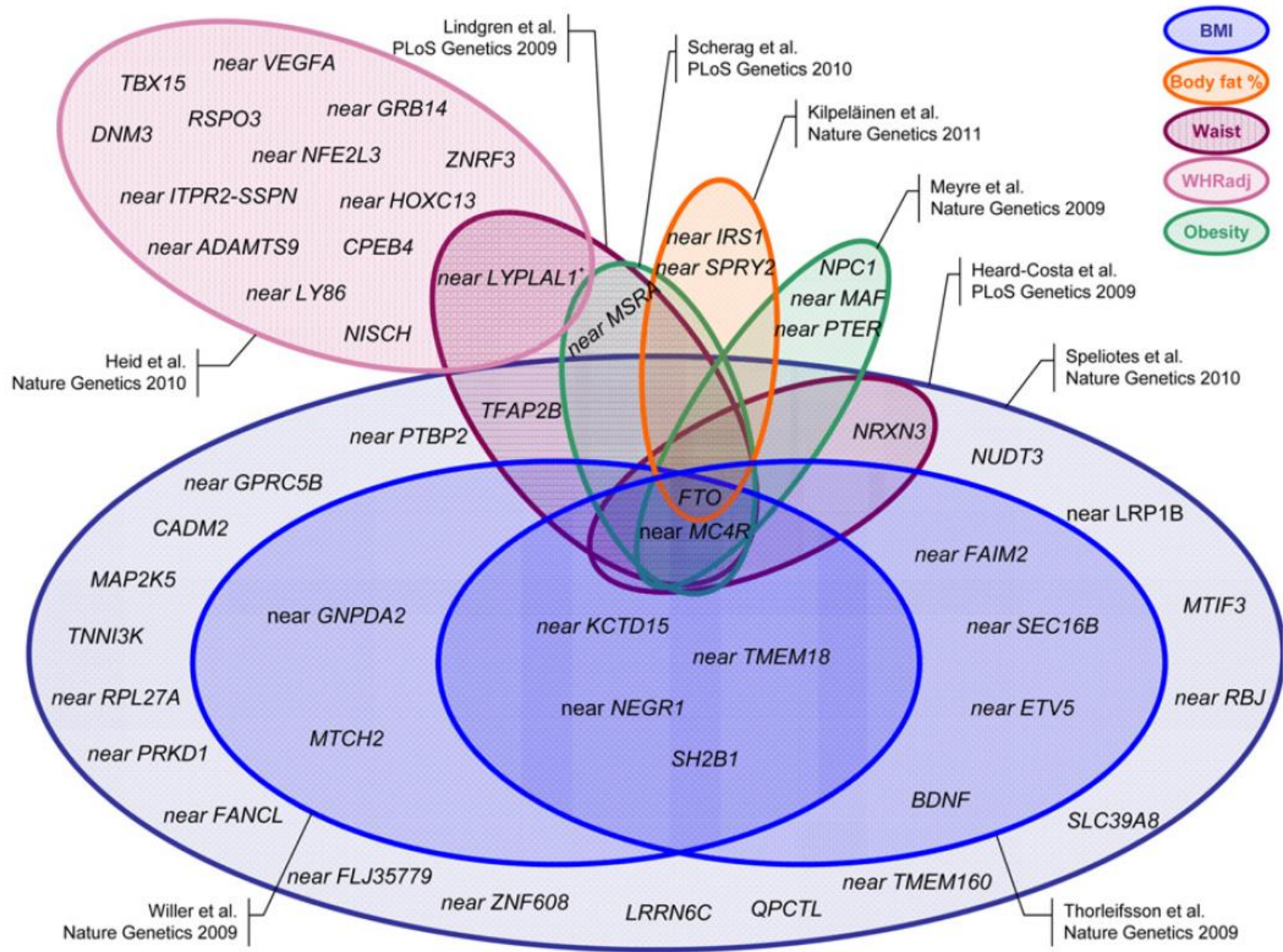
### Labrador guide assistance dogs

WT 23%  
 Hets 64%  
 Homs 12%

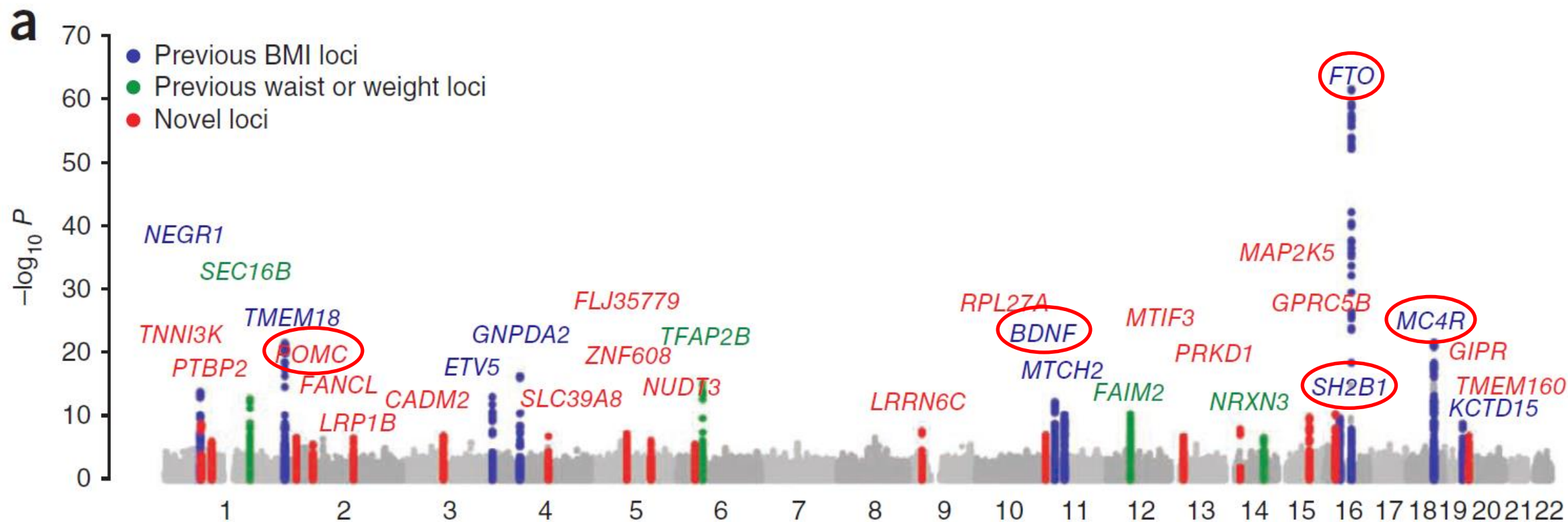


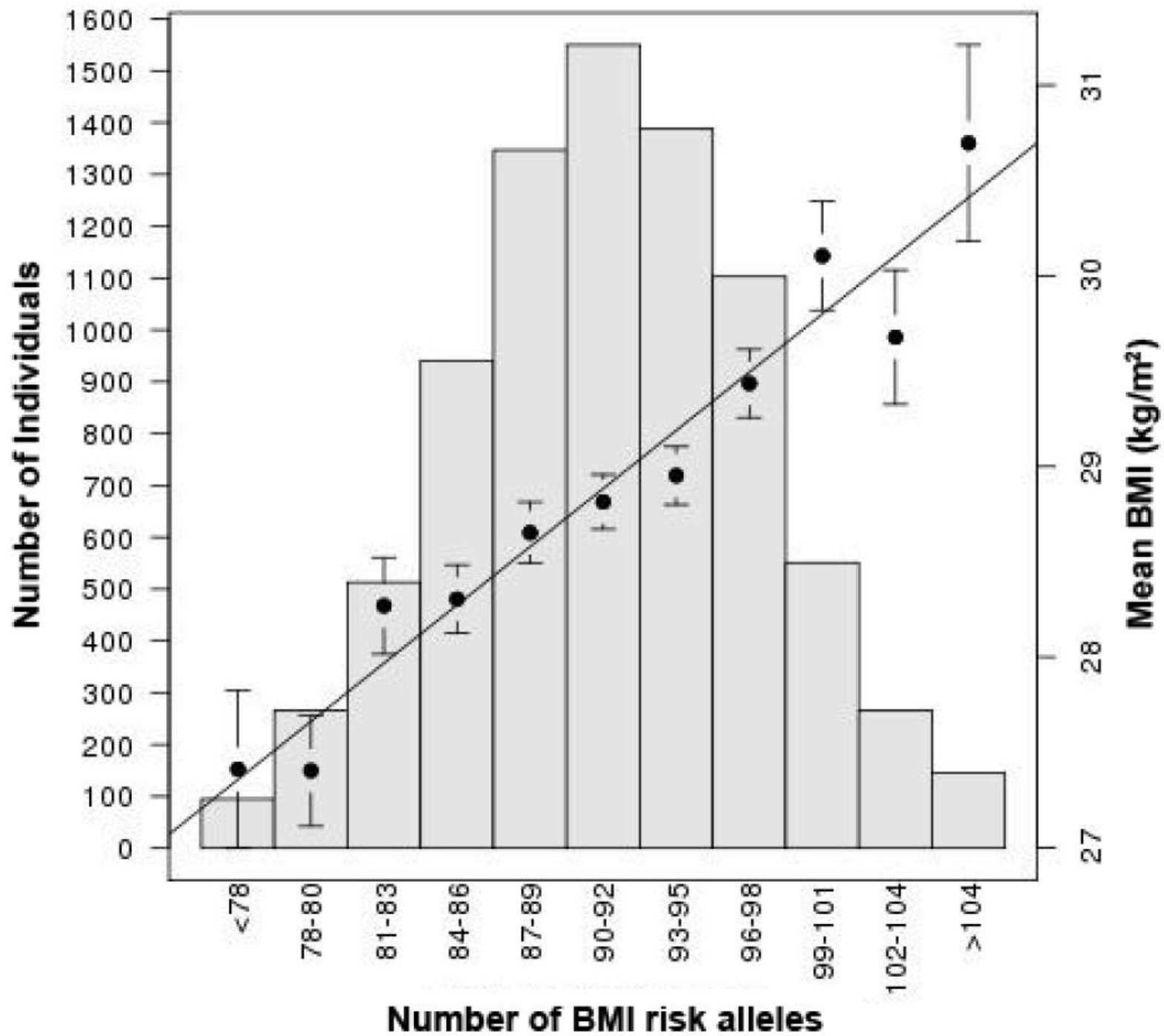
# Monogenic vs Polygenic Obesity

# GWAS and common obesity



# Association analyses of 249,796 individuals reveal 18 new loci associated with body mass index





**Your genes are like a hand of poker**



**You can't do anything about the cards you have  
But you can choose how to play them**

**There's always time and (tummy) space for dessert**



**Are we all sinners?**







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