

Group 1 : Heritability

- What is it ? → see class notes
- How can you estimate it?

→ twin studies, other designs as well to estimate this?

→ Can all types of genetic markers be used to estimate genetic heritability? In particular, should we use only those SNPs that have already been associated to disease? Or should we take all available SNPs (so all the SNPs that have been genotyped)?

- o (Epigenetics?)
- Role in the disease pathology? (practical item)
- Consequences for subsequent analysis? When there is a genetic component, you would like to know which one(s). You would also like to know where this component is located.

Group 2: Personalized medicine

- What is this?
- Link to personal genome testing
- What is the link with genetic epidemiology? Does it fit in?
 - o Note: epidemiology is about populations and related to public health issues. Personalized medicine, as the term indicates, is about individuals
- Practical example where it is used in practice?
 - o Pharmaceutical companies want to find individual ‘genetic’ signatures... These signatures can be important to assess whether a drug will work for this person or not.
- Prediction ~ personalized medicine

Group 3: A practical oriented topic – for example aging, obesity

- Is there any evidence for a genetic component?
- How was this assessed?
- Is this knowledge translated to “medicine” (meaning: did it influence drug development?)
- Link with molecular biology (for aging: telomeres)

Group 4: Gene-environment interactions

- Examples of gene-environment interactions:
 - o Pick a disease or trait
 - o Which epidemiological factors have been identified?
 - o Is there any evidence that these or some of these have a different effect, depending on genetic background (so depending on which “genotypes” you have)?
 - o Note, also: “Non-genetic factors change the effect of the SNP/gene?” (environmental epigenetics)
- Which methods do people use to identify these genetic effect modifiers? (genetic effect modifier = a gene that changes the effect of the non-genetic factor)
- Epigenetics (can even be taken as a topic on its own)

Group 5: early genetic programming

- Example driven:
 - o In utero environment / effects
 - o Omega3 effects
- Link to gene-environment interactions (see group 4)