

Exploring sex-specificities of lymphoma genomic profiles in the UK Biobank

ISHG 2022

Dr Claire Hill

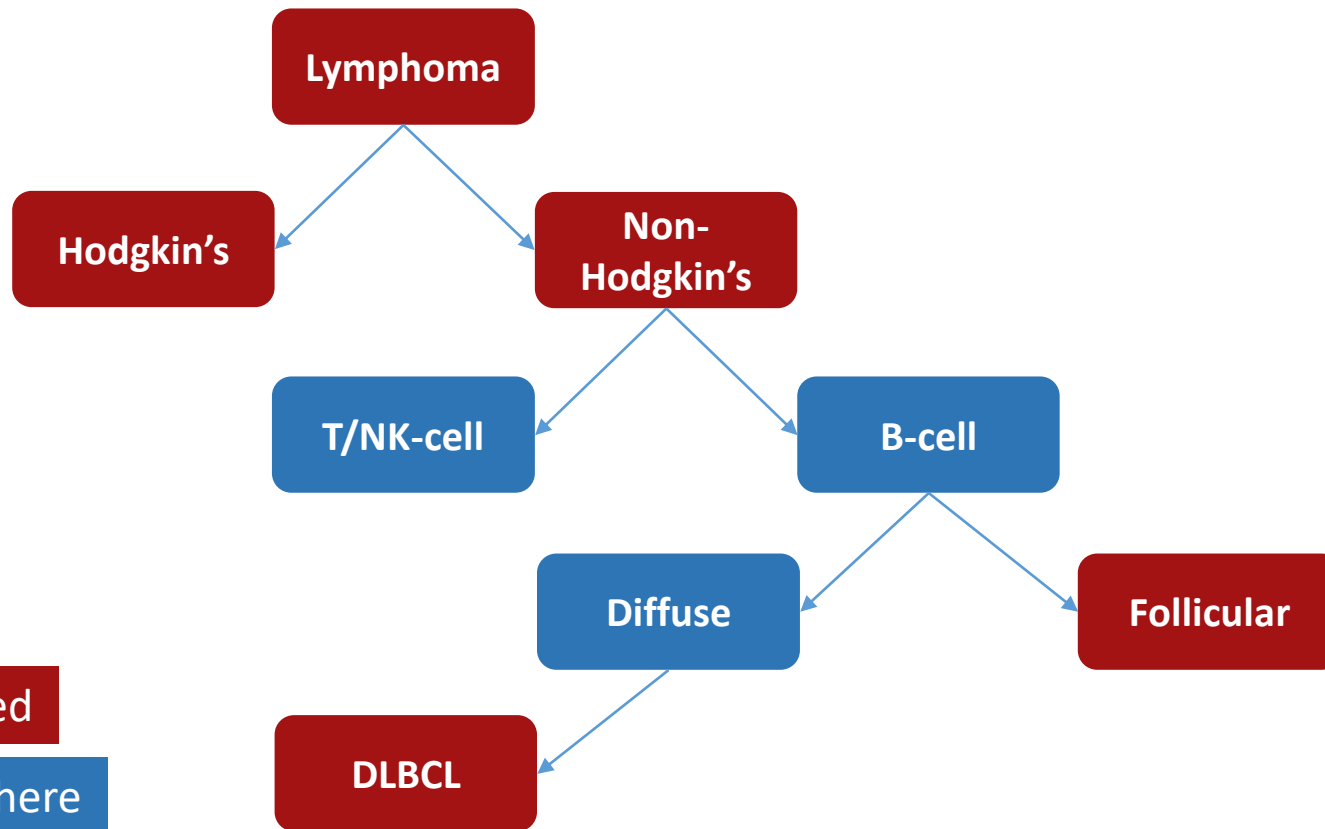


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Lymphoma – summary of (some) subtypes

- Lymphoma is a type of haematological malignancy.
- Sub-classification has advanced due to improved genomic and biological knowledge



GWAS analysis completed

Not specifically studied here

Lymphoma is more prevalent in males

- Incidence of cancer is often higher in males.
- This is also observed in lymphoma:

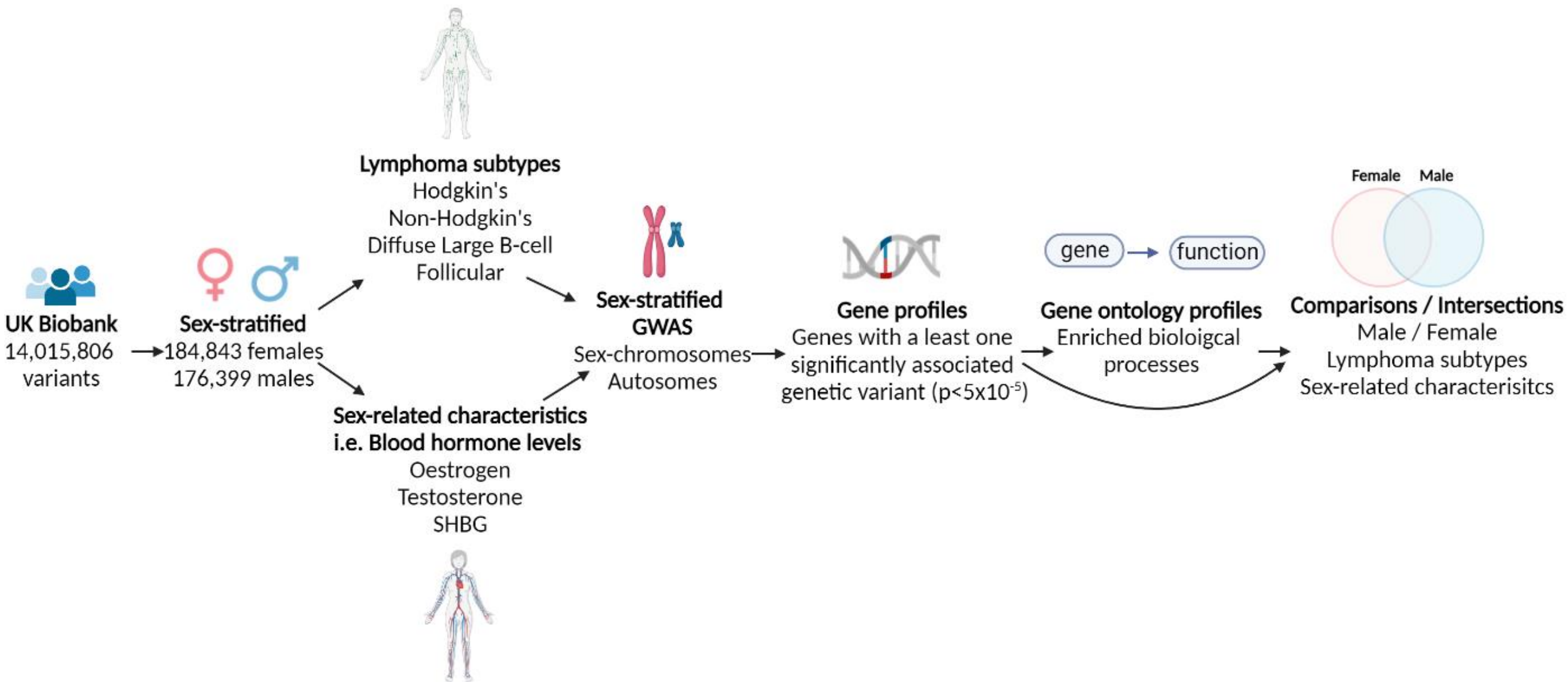
	2019	Prevalence	Deaths
	NHL	1.57 x	1.34 x
	HL	1.29 x	1.65 x

*GBD 2019 Demographics
Collaborators, Lancet, 2020*

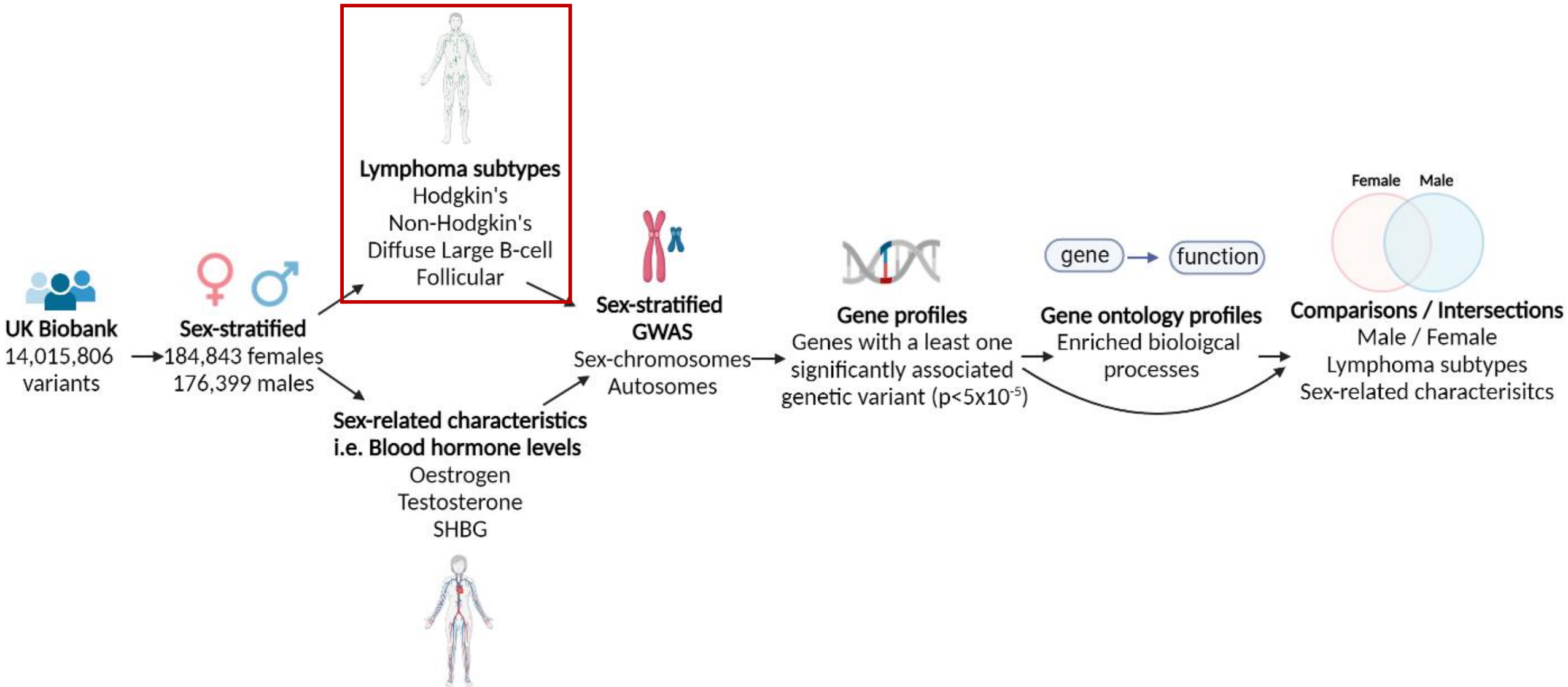
- Scope exists to explore the **sex differences** in lymphoma genomic profiles



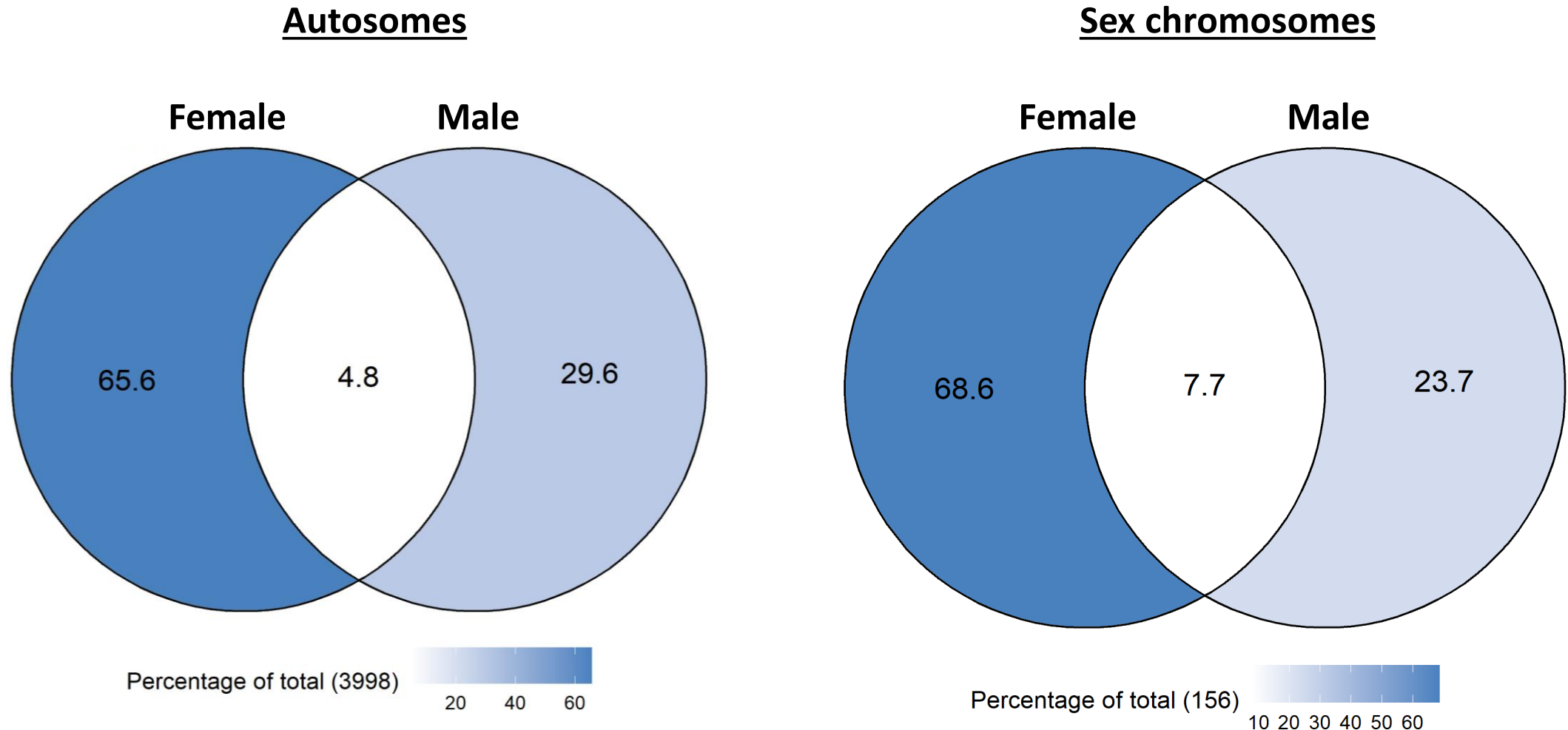
Harnessing the UK Biobank



Harnessing the UK Biobank – Lymphoma subtypes



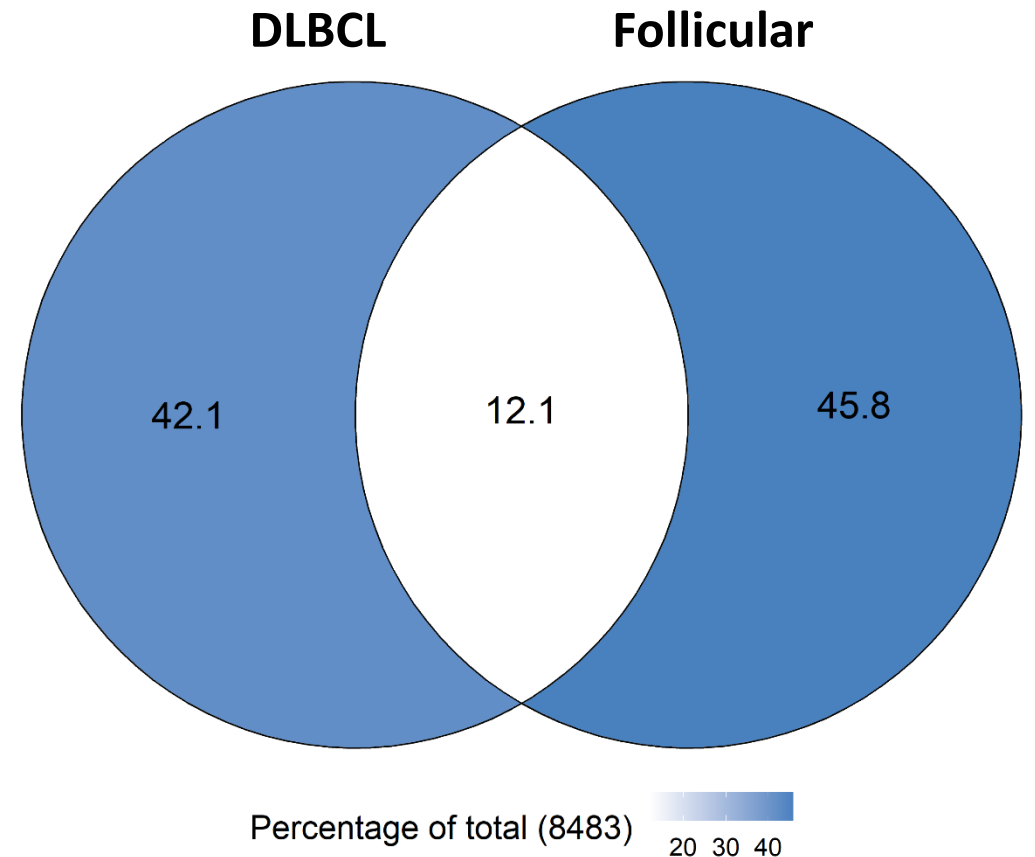
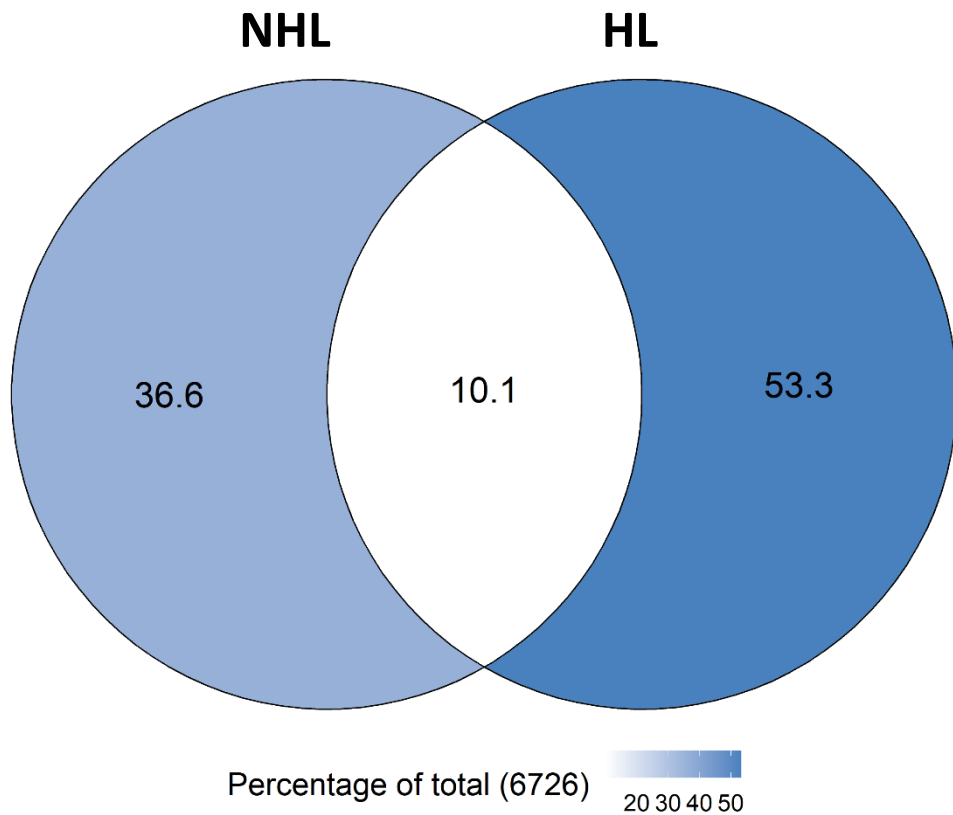
Distinct differences between Male and Female lymphoma gene profiles



- 4.8 to 12.9% overlap depending on lymphoma subtype

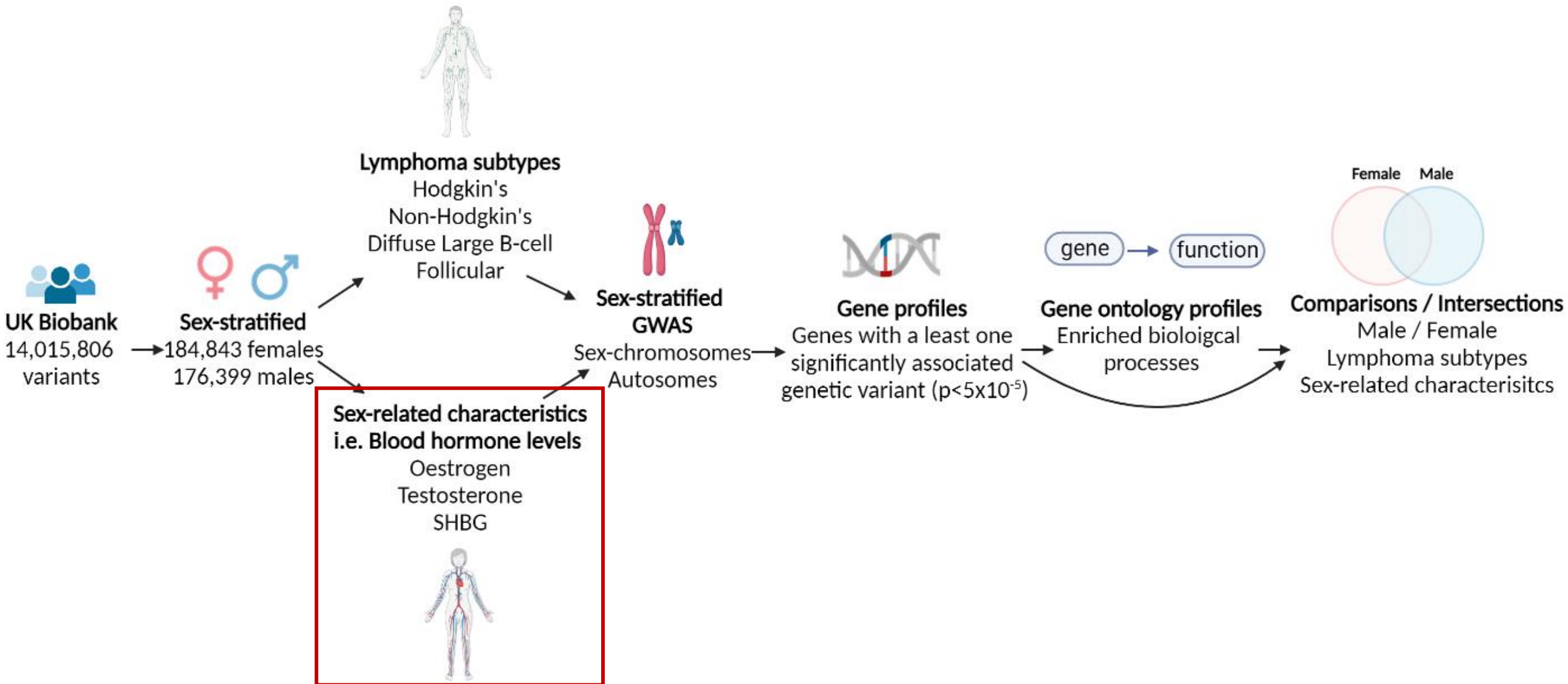
Comparing lymphoma subtypes reveals largely unique gene profiles

Female autosomes:



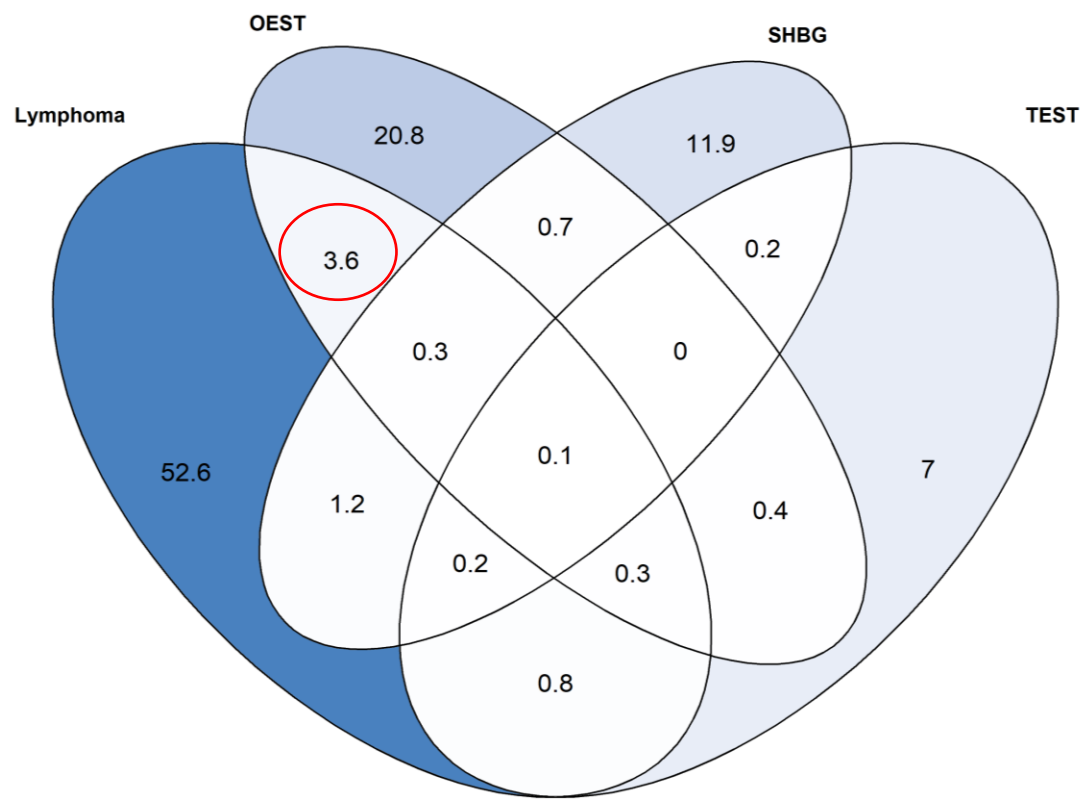
- 5.1 to 20.1% overlap depending on subtype comparison / sex

Harnessing the UK Biobank – Hormone levels



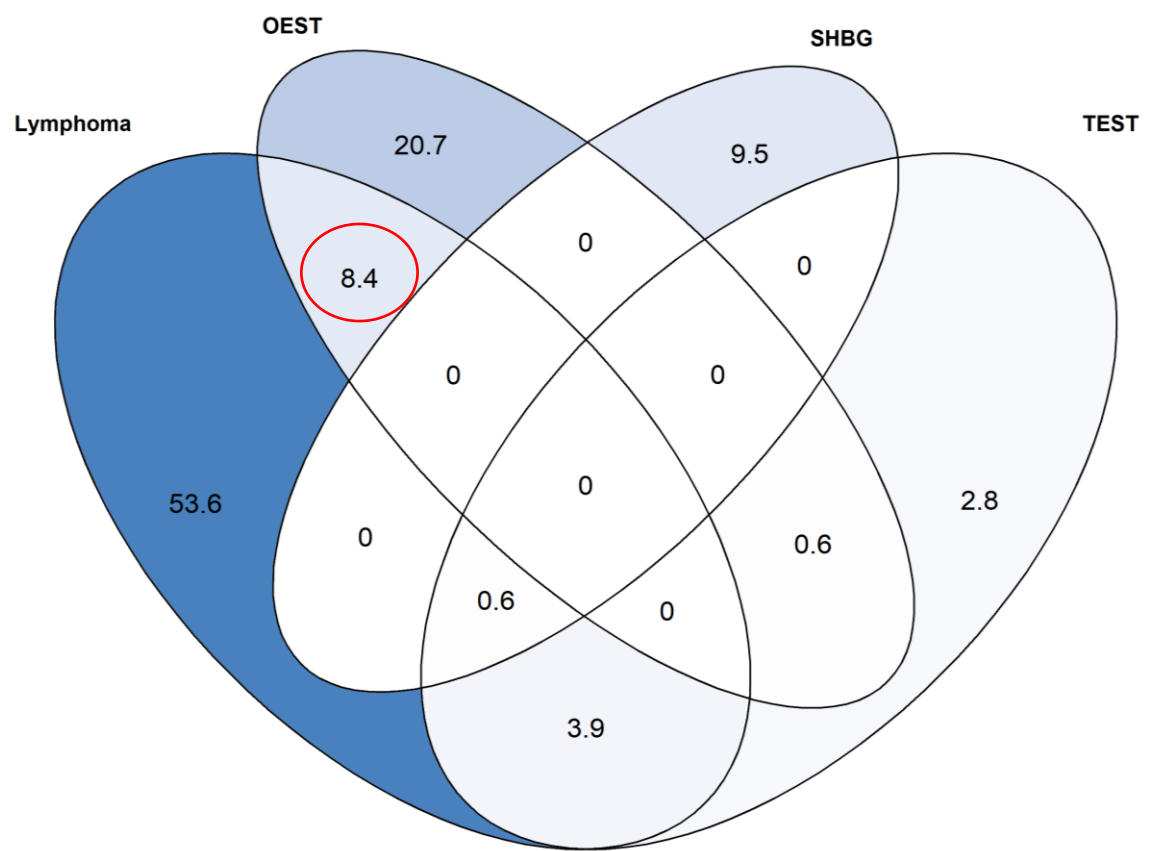
In Females, largest overlap observed between lymphoma and oestrogen gene profiles

Autosomes



Percentage of total (4772)
0 10 20 30 40 50

Sex chromosomes

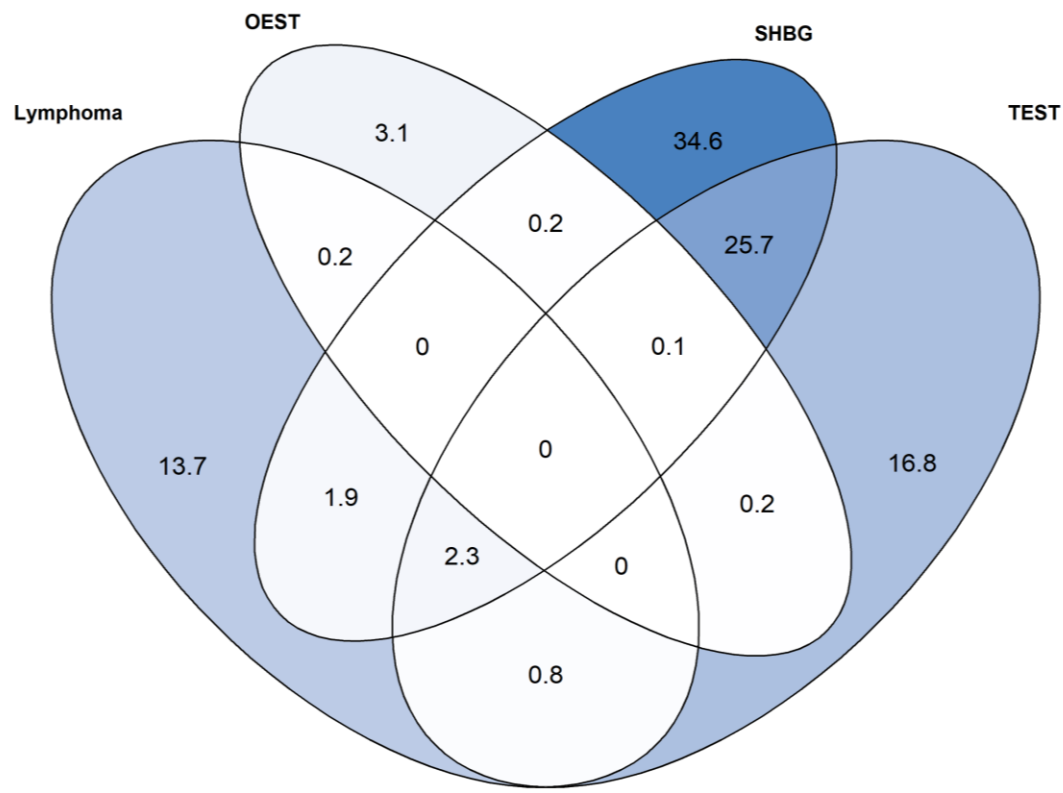


Percentage of total (179)
0 10 20 30 40 50

- 3.6 to 9.1% depending on specific lymphoma subtype

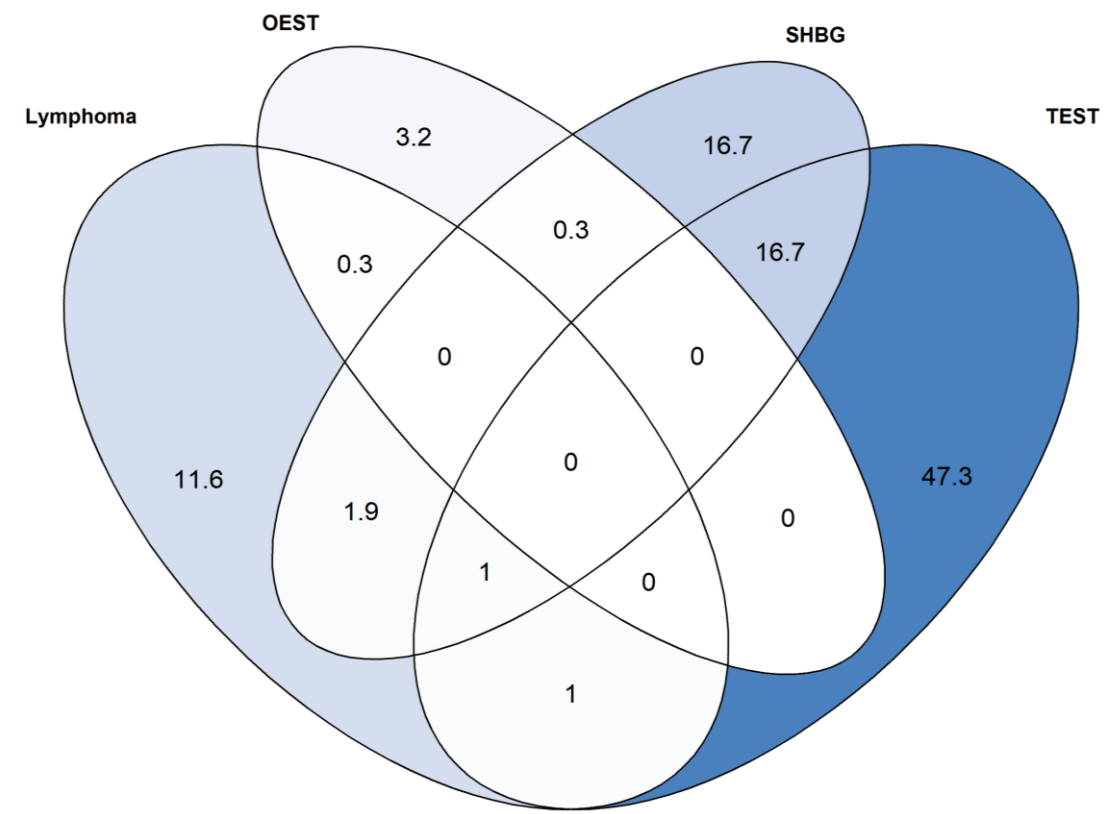
In Males, little overlap observed between lymphoma and hormone gene profiles

Autosomes



Percentage of total (7176) 0 10 20 30

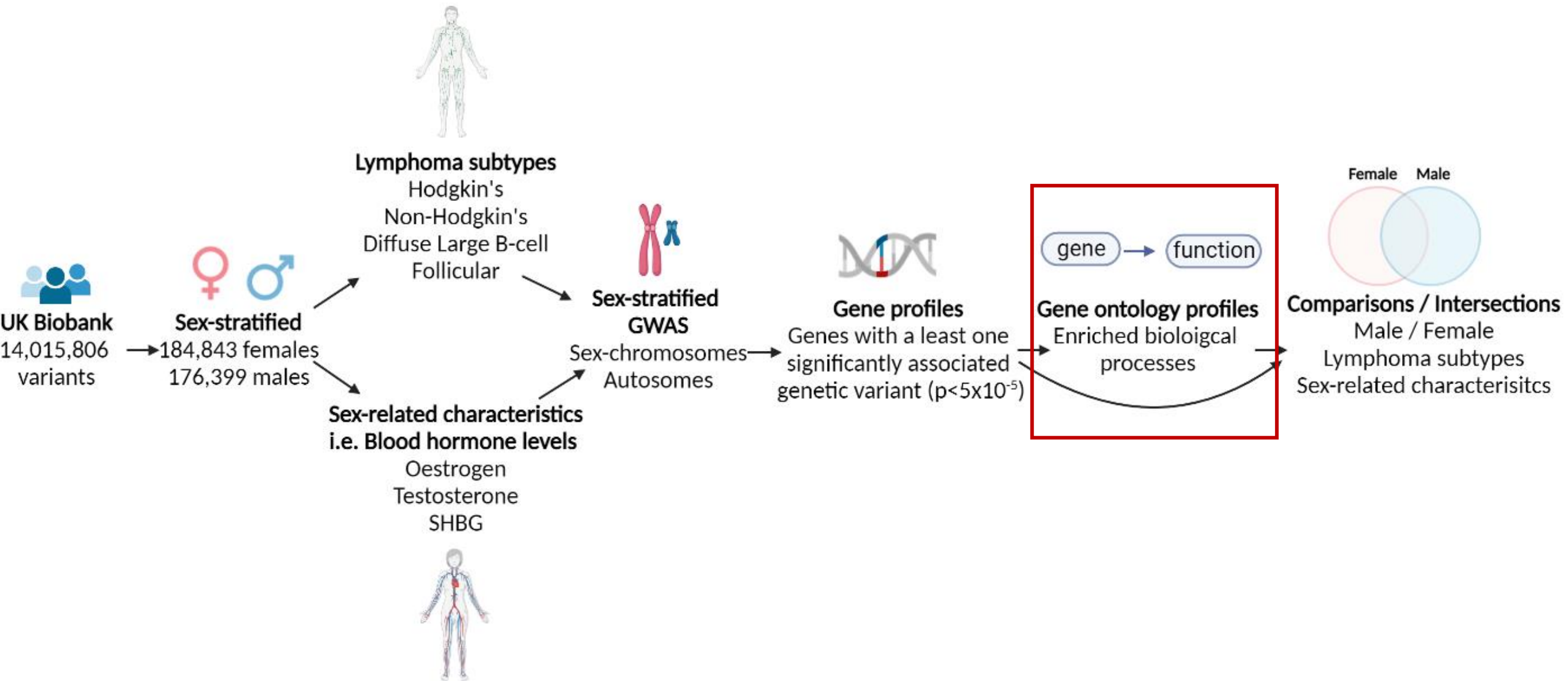
Sex chromosomes



Percentage of total (311) 0 10 20 30 40

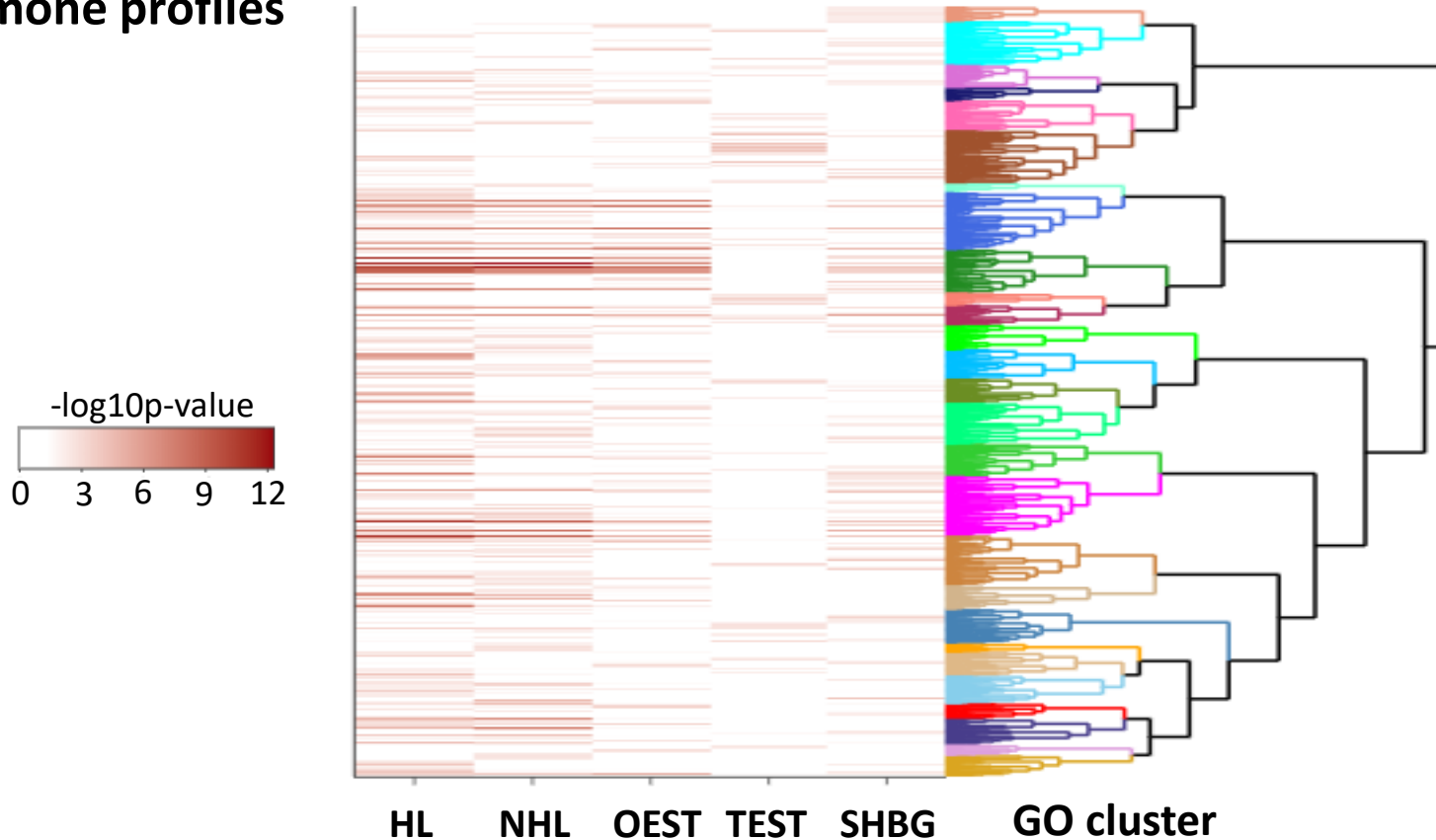
- Very similar picture when exploring specific lymphoma subtypes

Harnessing the UK Biobank – Gene Ontology



Distinct Gene Ontology profile overlap between lymphoma and oestrogen in females

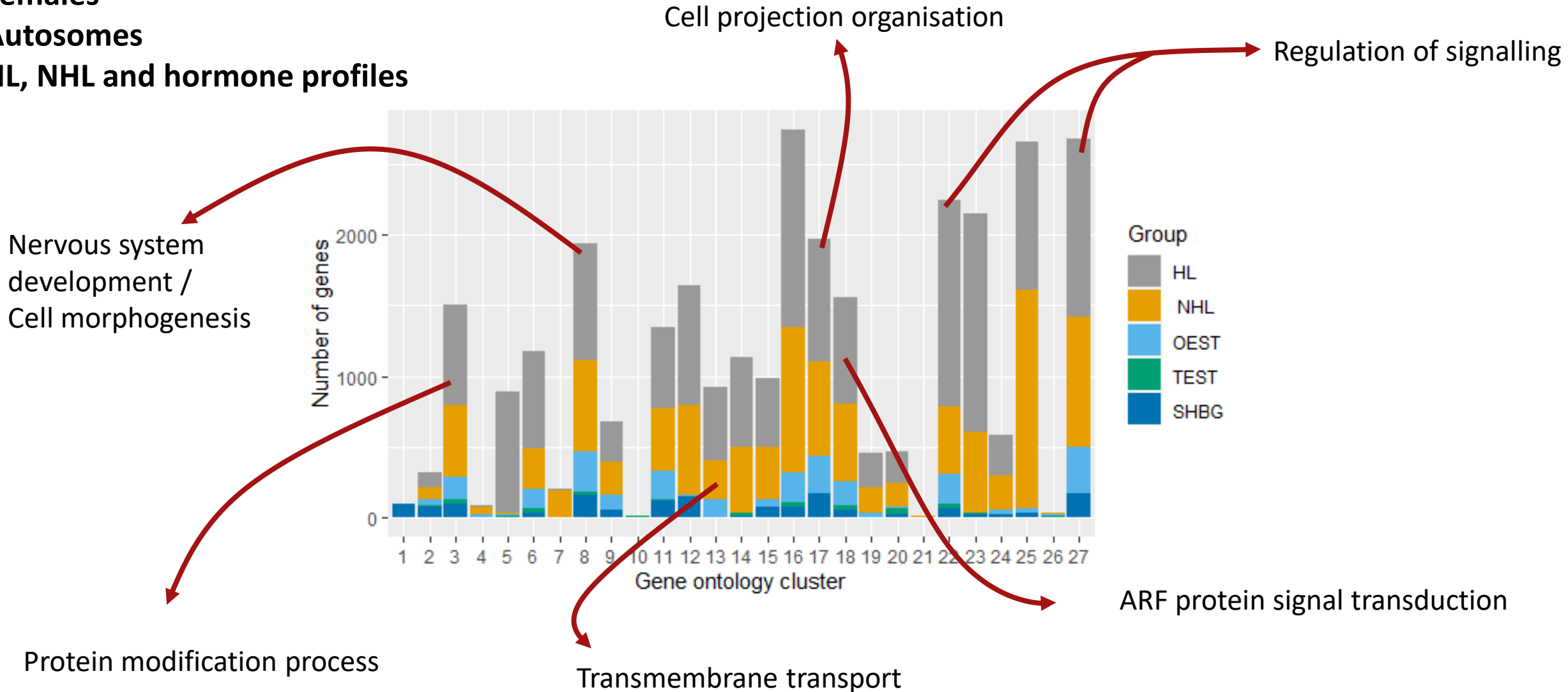
Females
Autosomes
HL, NHL and hormone profiles



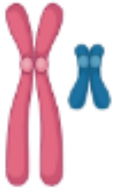
*Using ViSEAGO
R studio Gene Ontology
package
Brionne et al., 2020*

Distinct Gene Ontology profile overlap between lymphoma and oestrogen in females

Females
Autosomes
HL, NHL and hormone profiles



Key points



- **Males and females** present distinct lymphoma gene profiles:
Up to 12.9% overlap (depending on lymphoma subtype)



- **Lymphoma subtypes** exhibit unique gene profiles:
Up to 20.1% overlap (depending on subtype comparison)



- **In females**, overlapping gene profiles for **lymphoma and oestrogen levels**:
Up to 9.1% (depending on lymphoma subtype)

- **Gene ontology** analysis provided **functional insights** into these overlaps:
Highlighting specific gene groups / pathways enriched in these gene profiles,
Future work exploring their influence on sex-differences in lymphoma



Acknowledgements

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Extra slides

Males
Autosomes
HL, NHL and hormone profiles

