

DTU



# Adverse Outcome Pathways: *an International Tool to Support Chemical Risk Assessment*

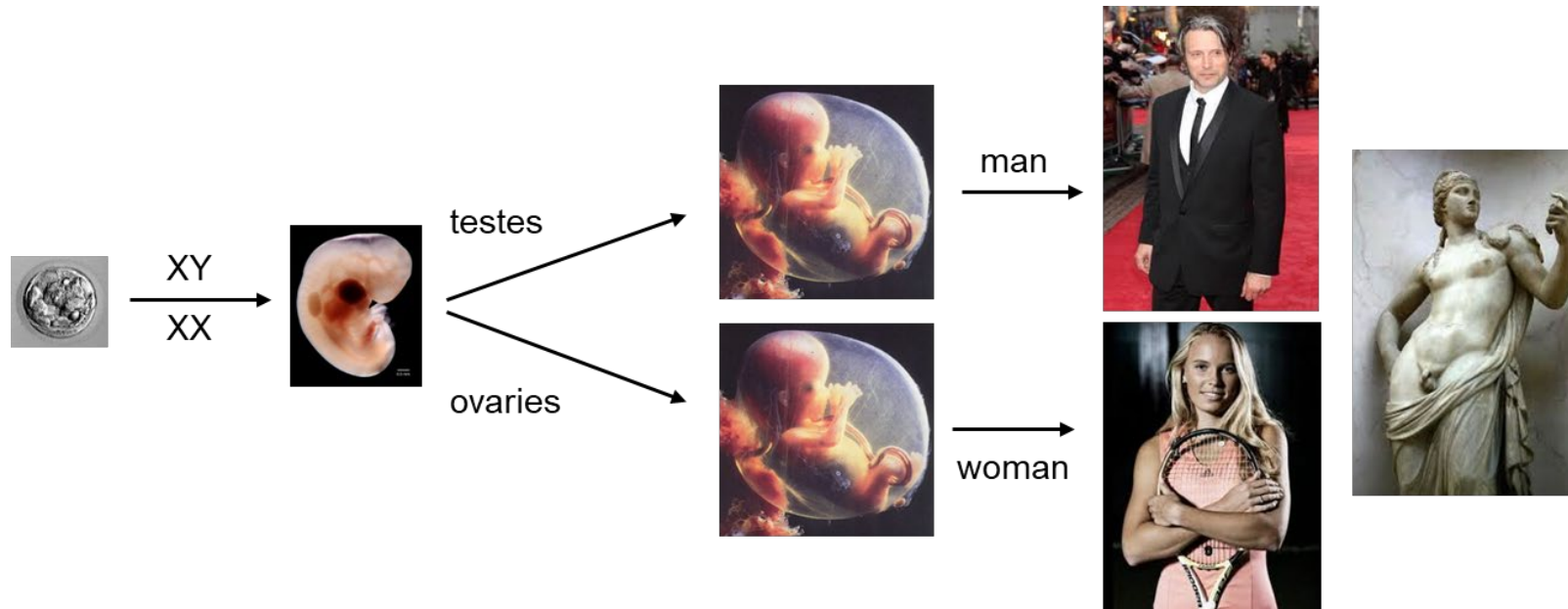


**Terje Svingen**

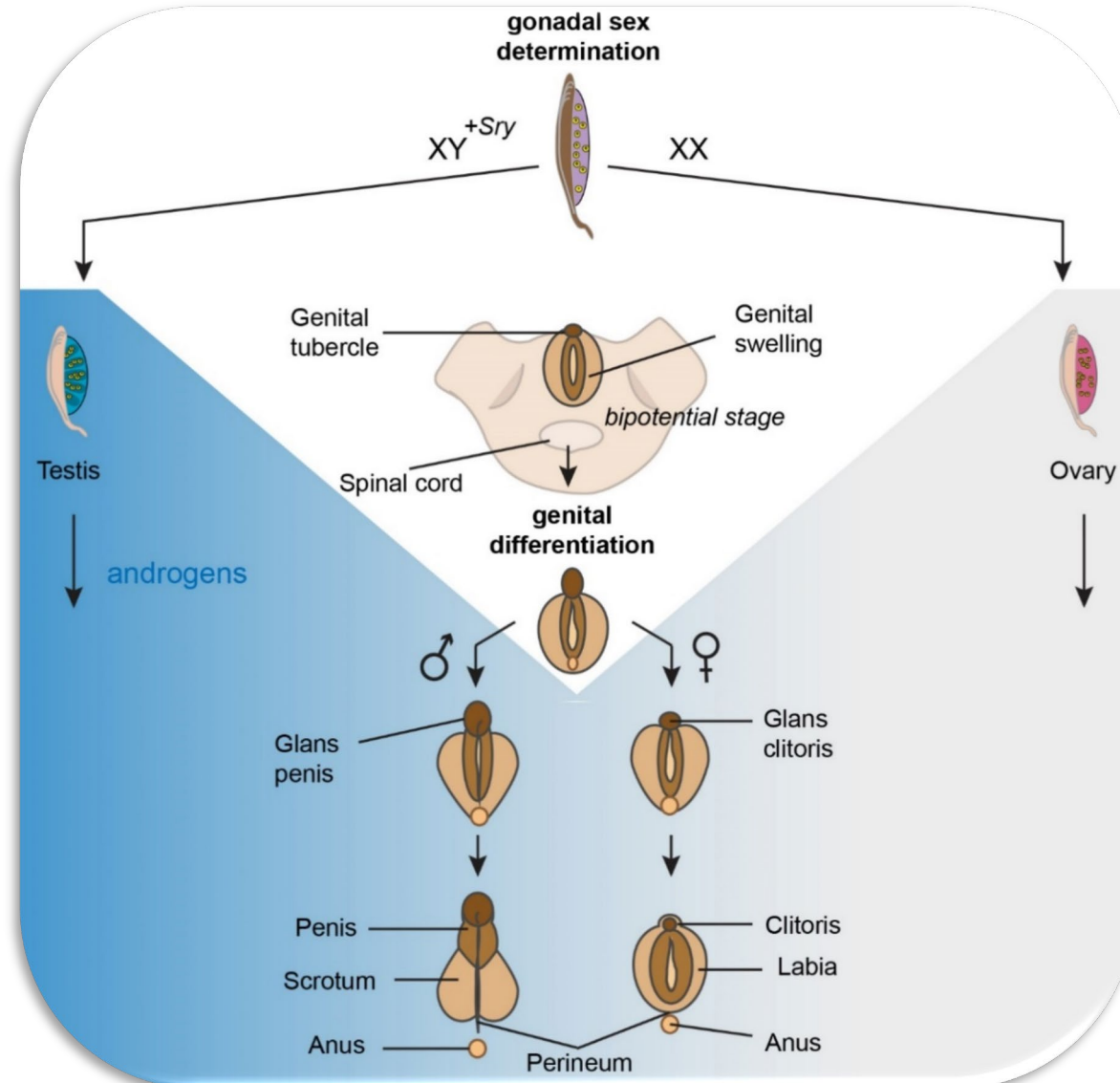
Associate Professor

DTU Food

# Sexual development is dependent on endocrine signalling

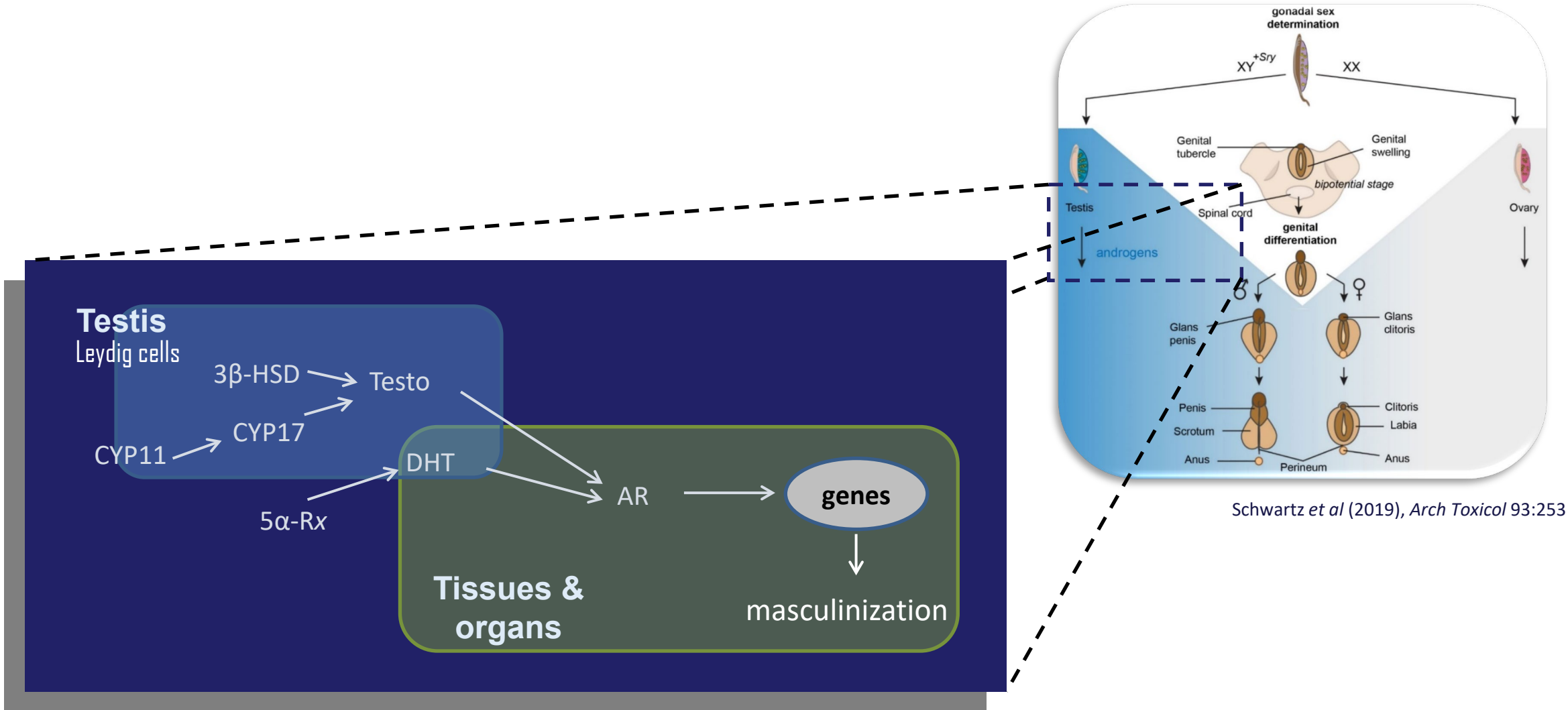


# From looking the same to different ....by the action of androgens



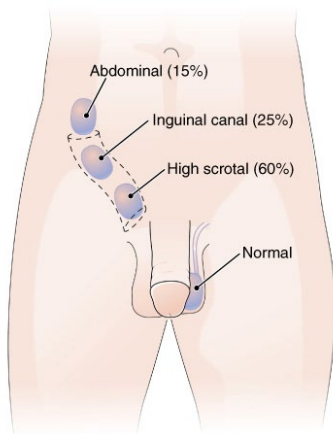
Schwartz et al (2019), Arch Toxicol 93:253

# From looking the same to different ....by the action of androgens

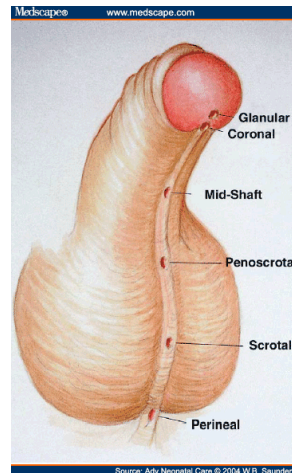


# Exposure to endocrine disruptors can thus:

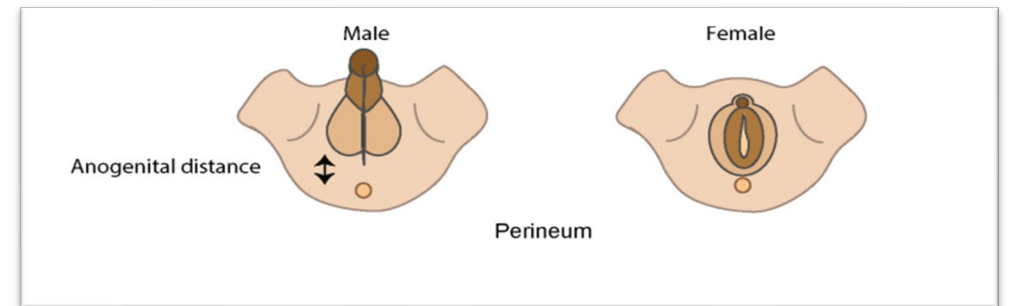
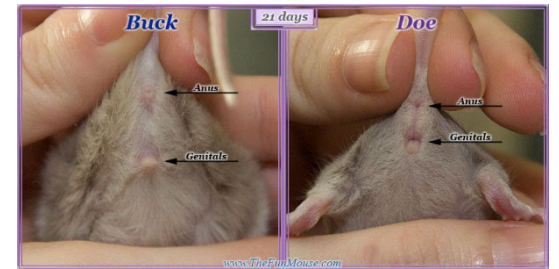
- disrupt endocrine signalling, *which can....*
- disrupt sexual development, *which can....*
- cause reproductive disorders



cryptorchidism



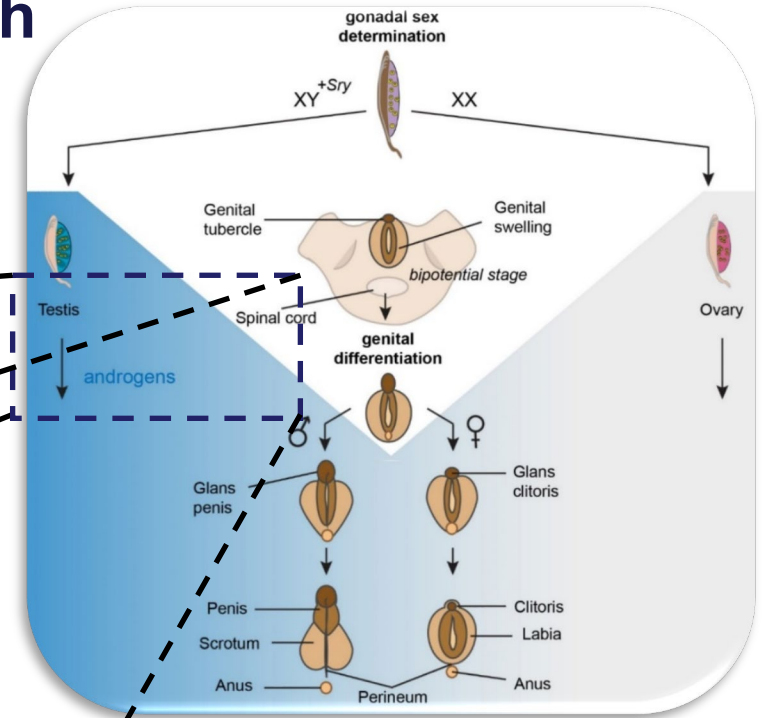
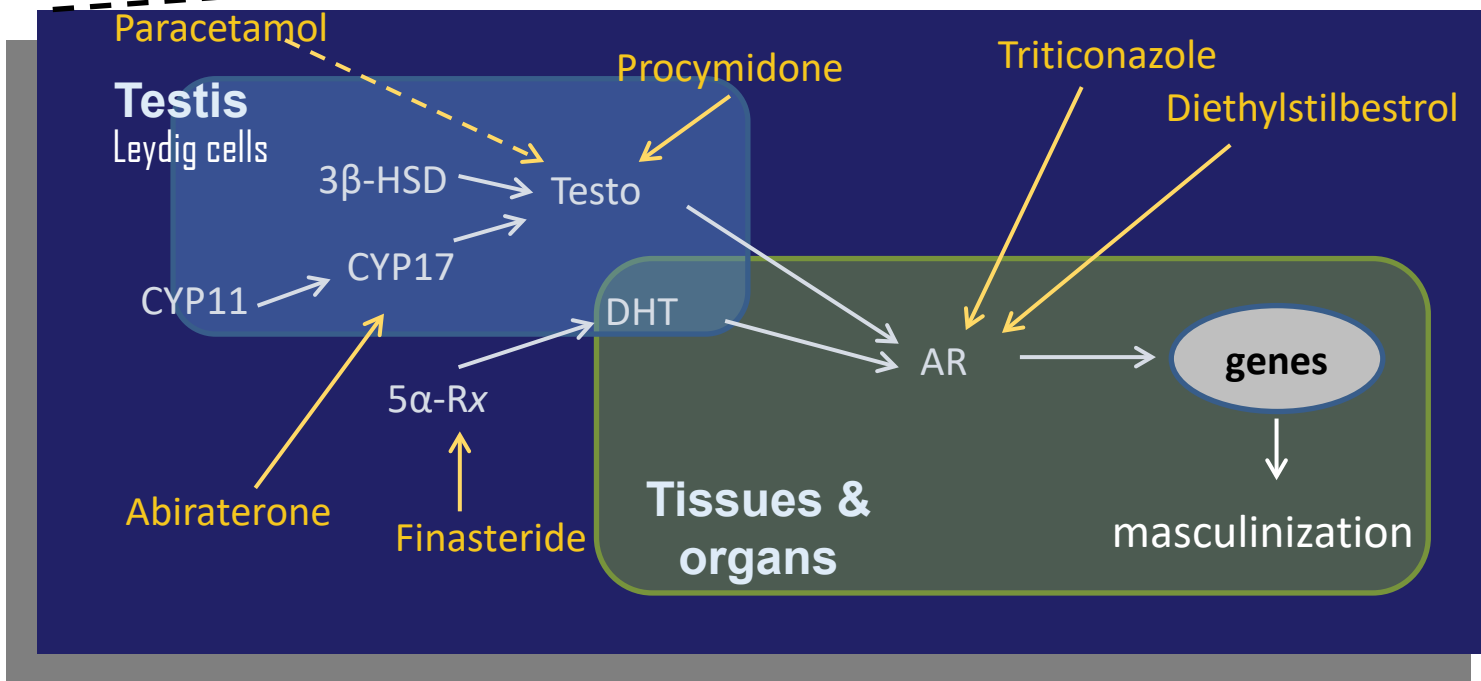
hypospadias



altered AGD

# Endocrine disruptors:

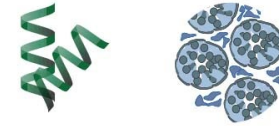
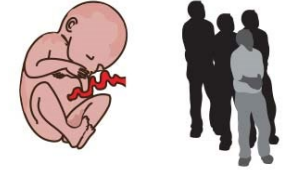
- using what we know to protect human health



Schwartz et al (2019), Arch Toxicol 93:253

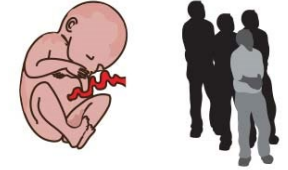
# Why basic research in toxicology?

- When we observe effects in humans, it is already too late for those affected
- Animal studies can establish causality
- In vitro / in silico studies can establish mechanisms of action



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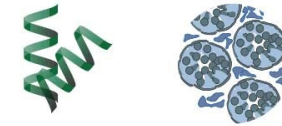
➤ When we observe effects in humans, it is already too late for those affected



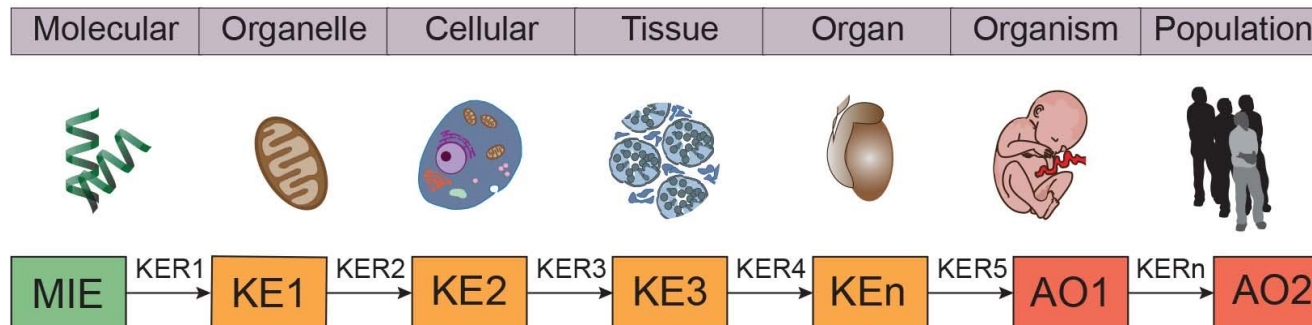
➤ Animal studies can establish causality



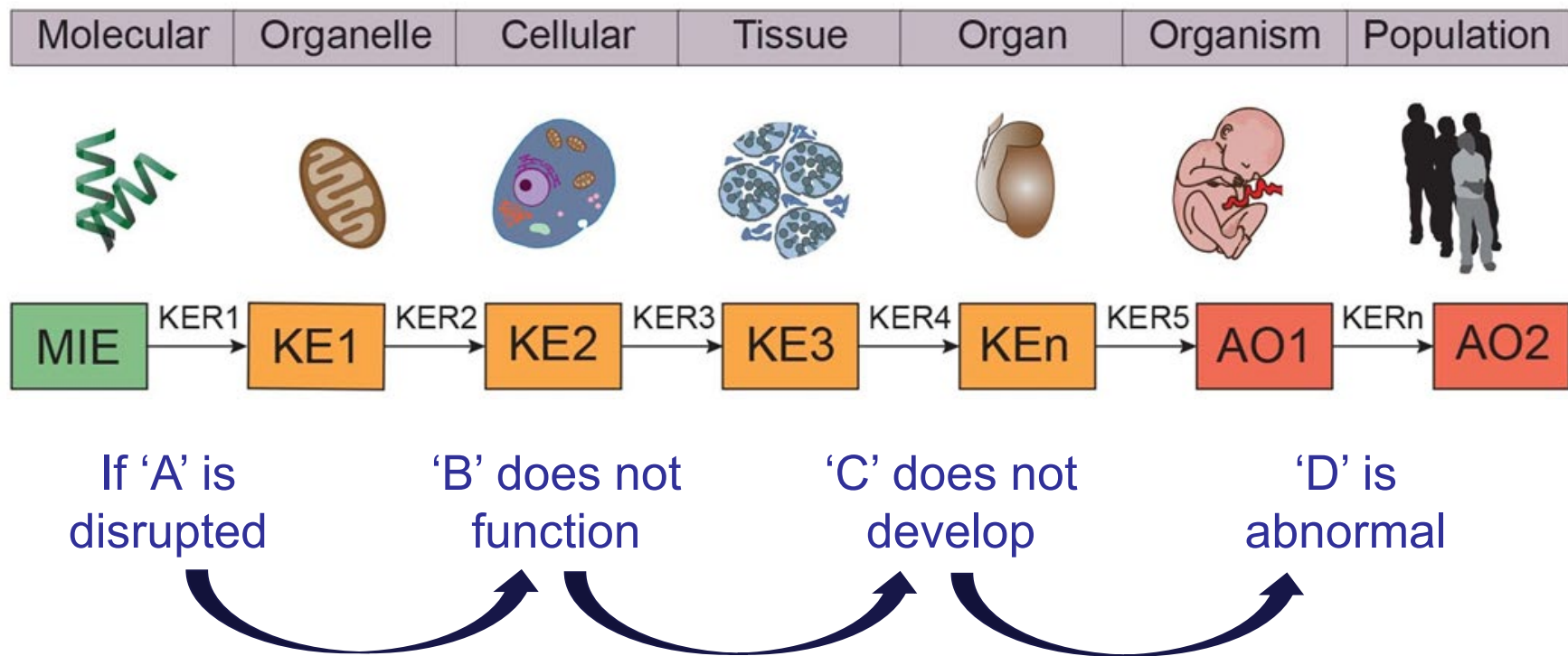
➤ In vitro / in silico studies can establish mechanisms of action



➤ **Causality, with mechanistic knowledge, can be used for predictive toxicology**

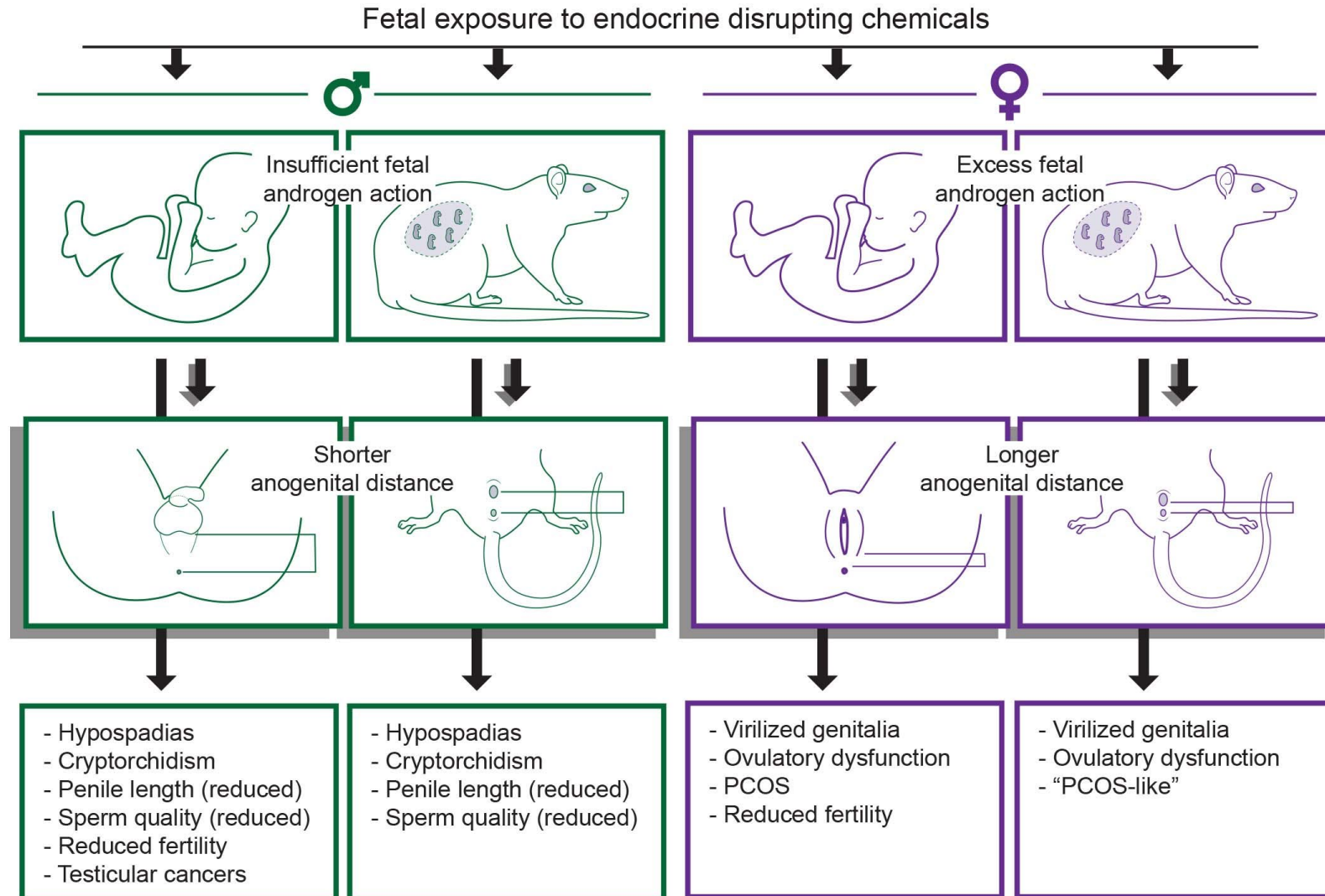


# Causality, with mechanistic knowledge, can be used for predictive toxicology



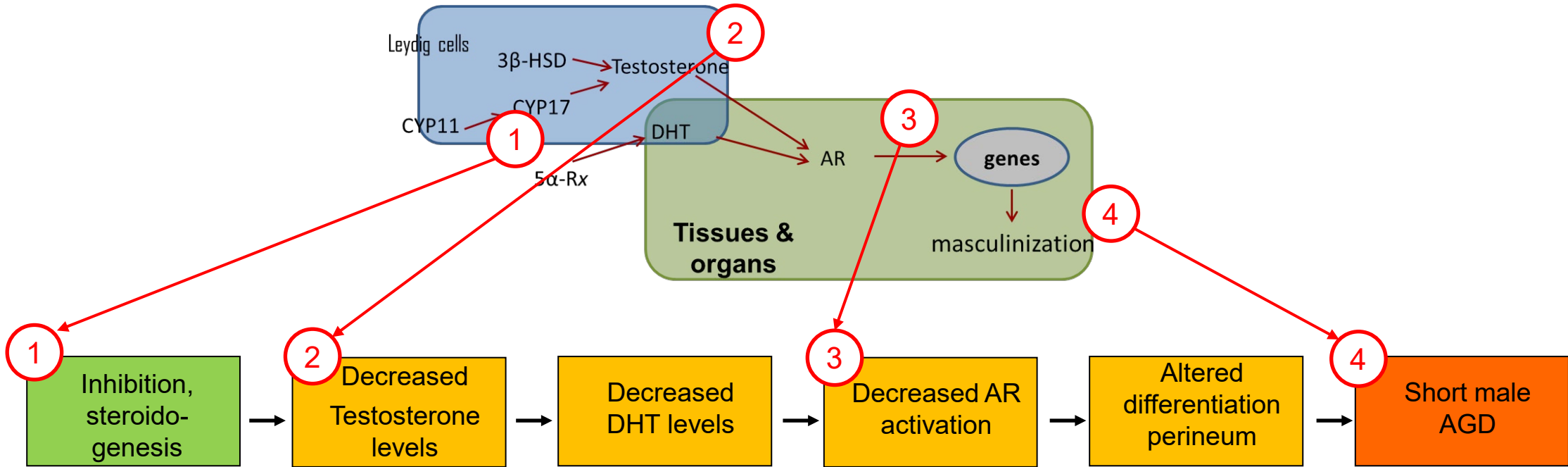
**Predictive Toxicology: If 'A' occurs, it is likely that 'D' manifest**

# Example: anogenital distance (AGD)

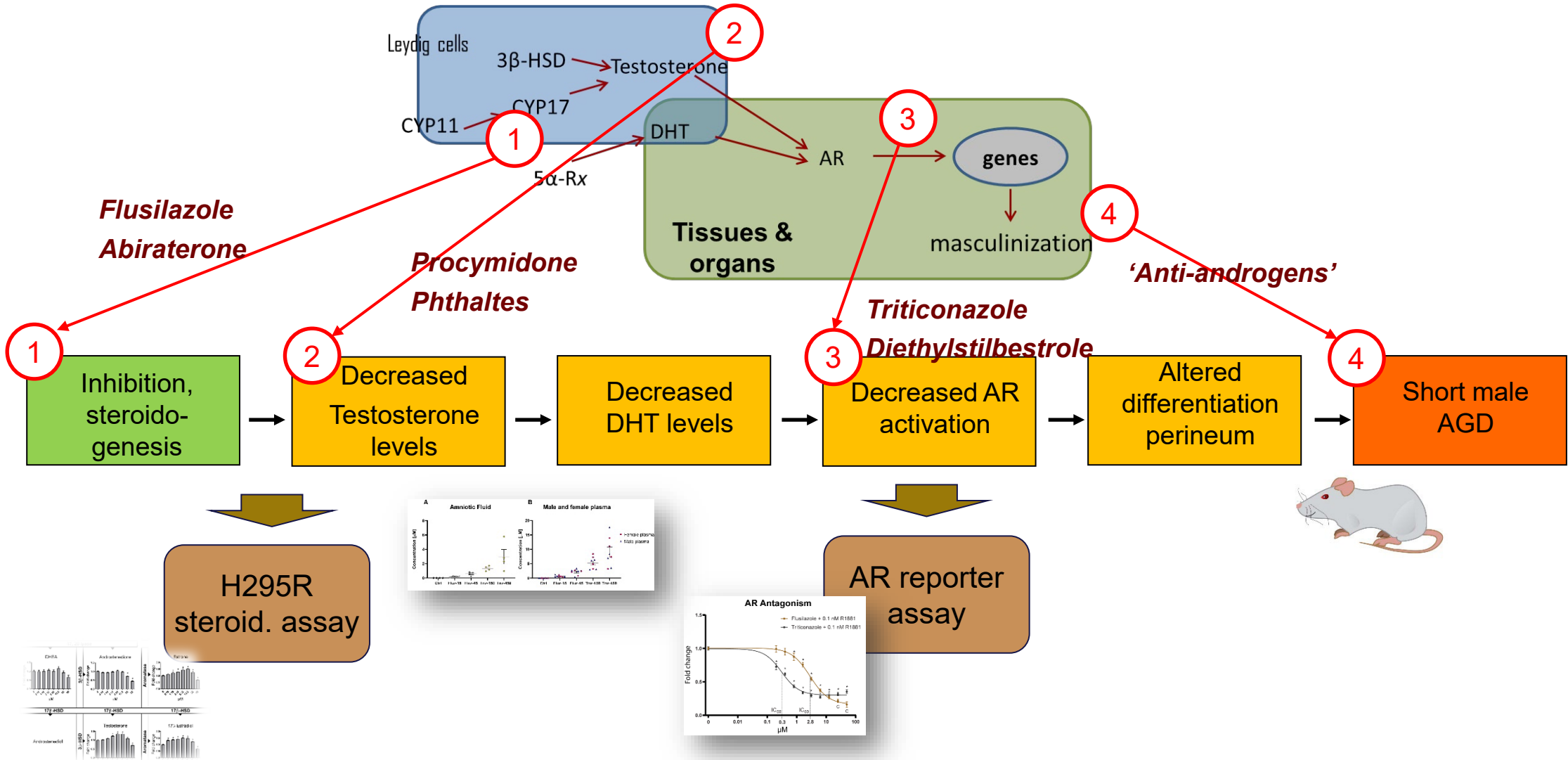


Svingen et al (2022), *Biomarkers in Disease*

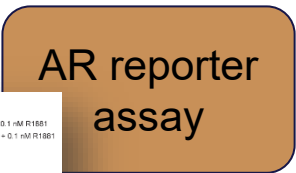
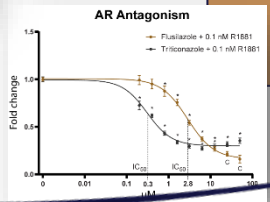
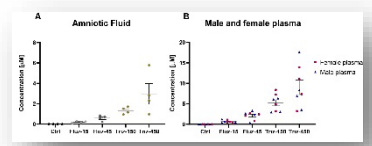
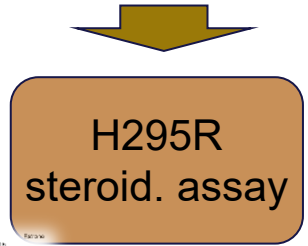
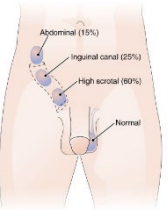
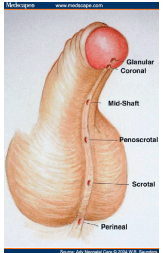
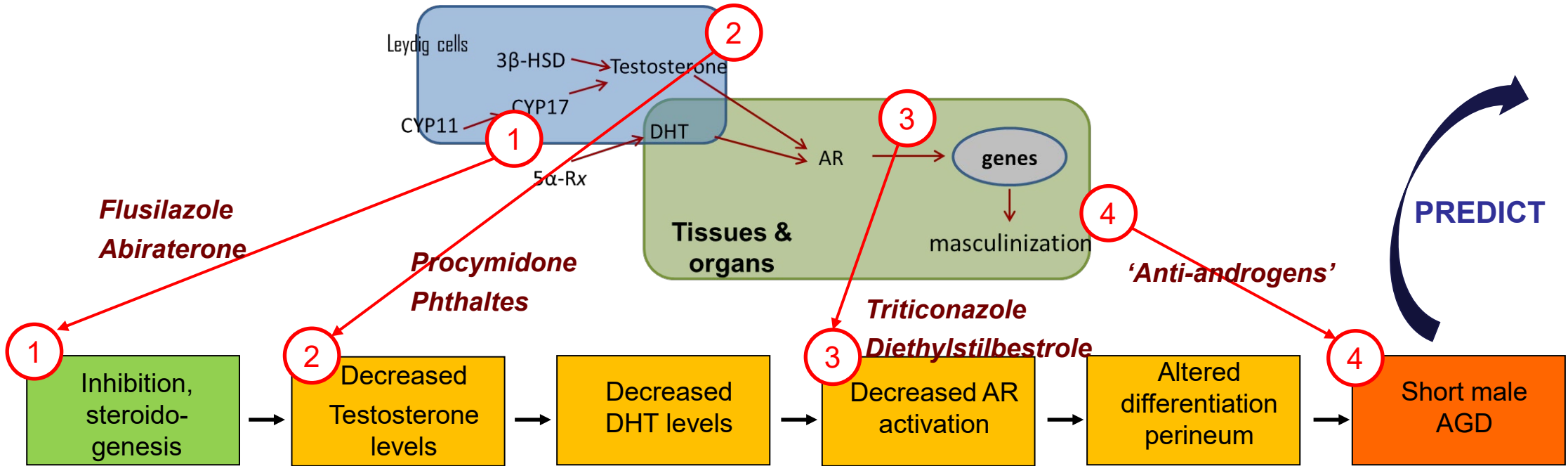
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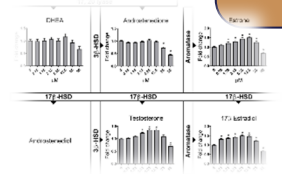
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**PREDICT**



# Thank you for your attention!

RESEARCH GROUP FOR  
MOLECULAR & REPRODUCTIVE TOXICOLOGY



**Funding:**



**Miljøministeriet**  
Miljøstyrelsen

**DANISH CENTRE ON ENDOCRINE DISRUPTERS**