

SCIENCES ET SEXUALITÉS

JOURNÉE DE FORMATION CONTINUE POUR
DÉCOUVRIR LES BASES NEUROBIOLOGIQUES
DE LA SEXUALITÉ HUMAINE | 21 SEPT. 2022



Sciences, sexes, identités

Un programme scientifique de promotion de
la santé sexuelle et de l'égalité de genre

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Bioscope UNIGE

★ SANTÉ SEXUELLE
SEXUELLE GESUNDHEIT
SALUTE SESSUALE
SUISSE SCHWEIZ SVIZZERA



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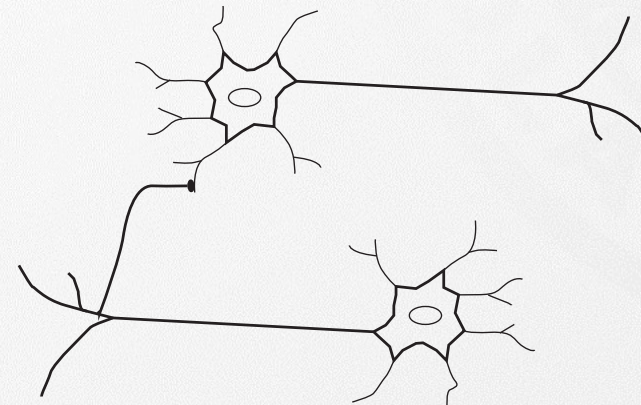
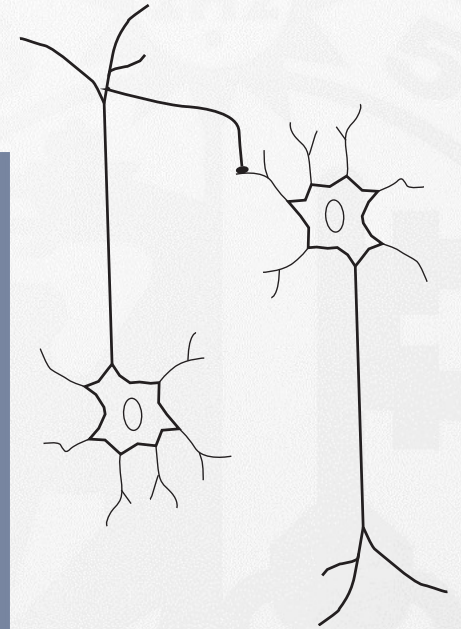
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Prof Janniko Georgiadis

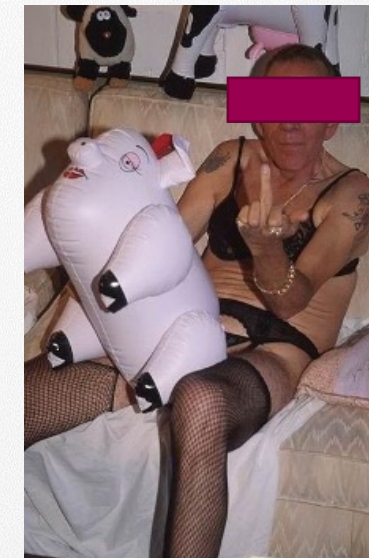
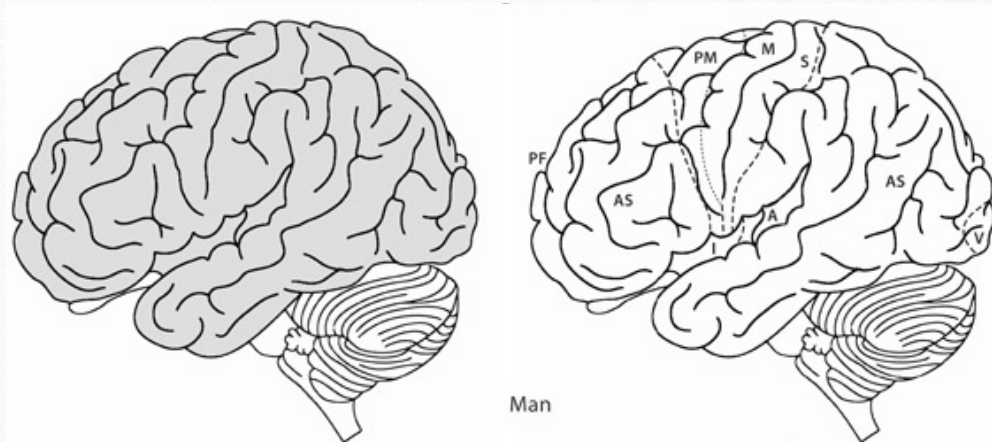
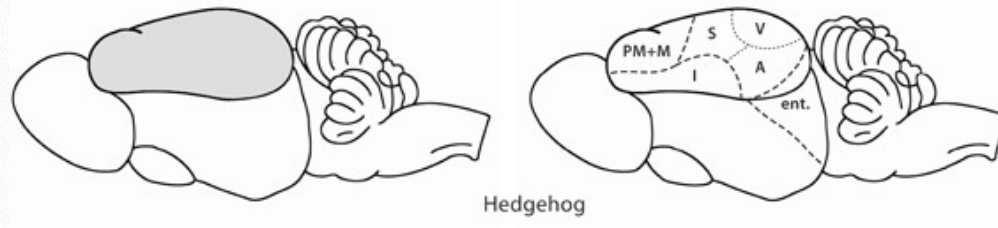
Head of the Section Anatomy and Medical Physiology, Department
of Biomedical Sciences of Cells & Systems,
University Medical System Groningen
The Netherlands

Brainless sex?



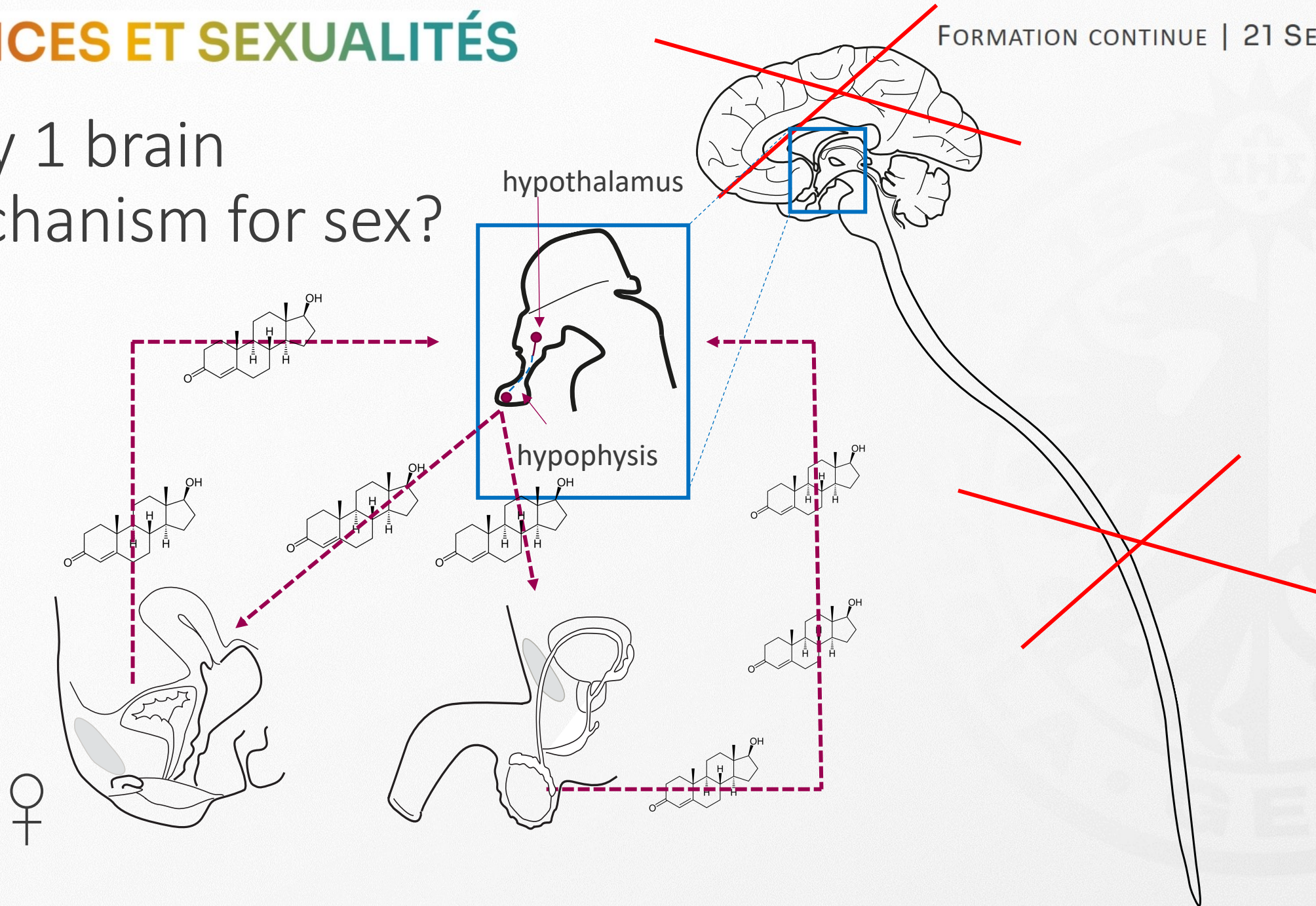
Speed
Flexibility
Sensitivity
Modulation

How your brain differs from your pet's



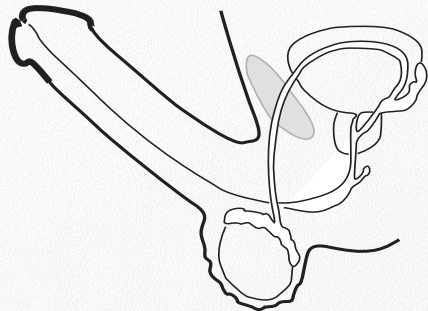
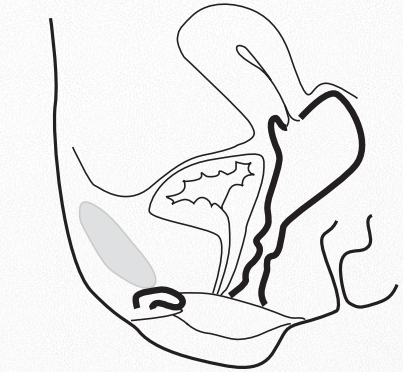
From: Nieuwenhuys, R. (1994). The neocortex: an overview of its evolutionary development, structural organization and synaptology. *Anat. Embryol.* 190, 307–337. doi: 10.1007/BF00187291

Only 1 brain mechanism for sex?

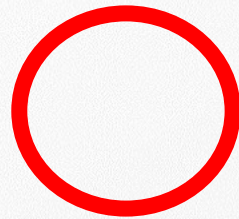


How do my genitals get aroused?

engorgement (genital arousal)

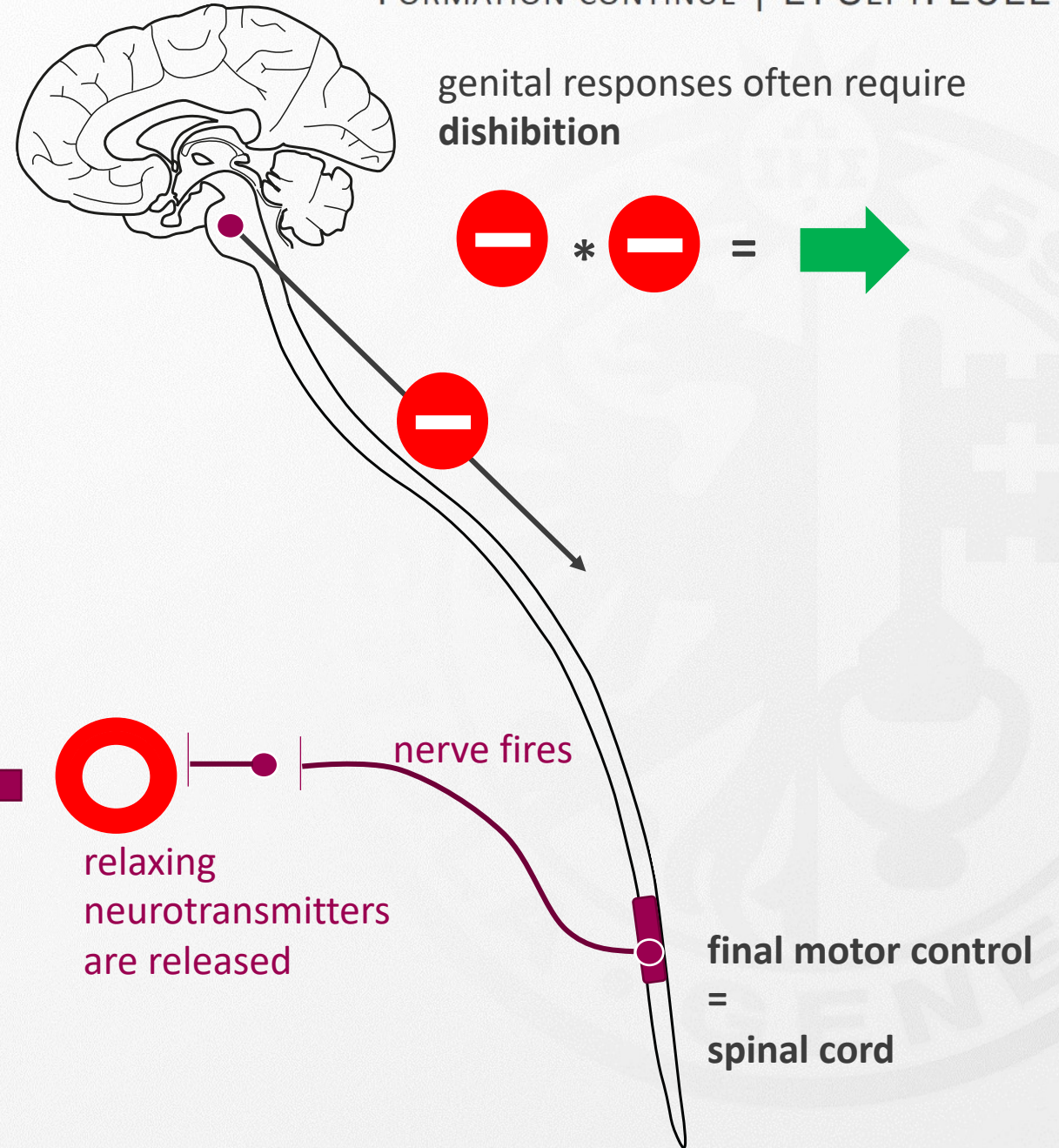


blood vessels relax



relaxing neurotransmitters are released

nerve fires



genital responses often require dishibition



final motor control = spinal cord

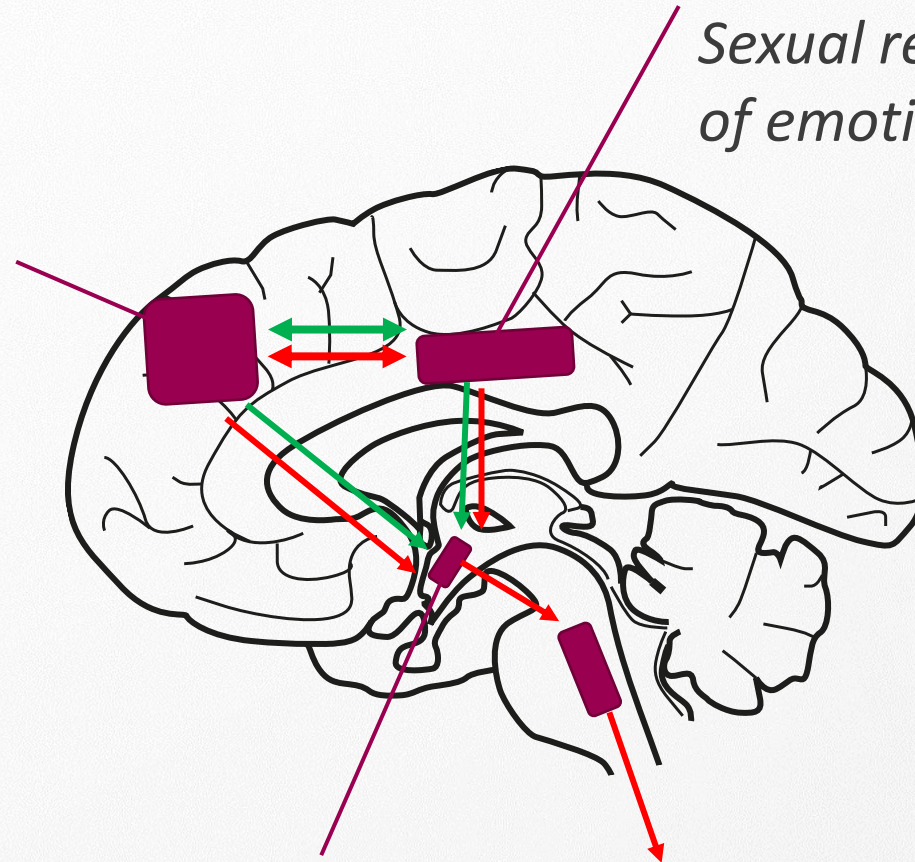
Who, what, when, where

Prefrontal cortex:

Sexual responses in context of rules and norms

Limbic system:

Sexual responses in context of emotional state



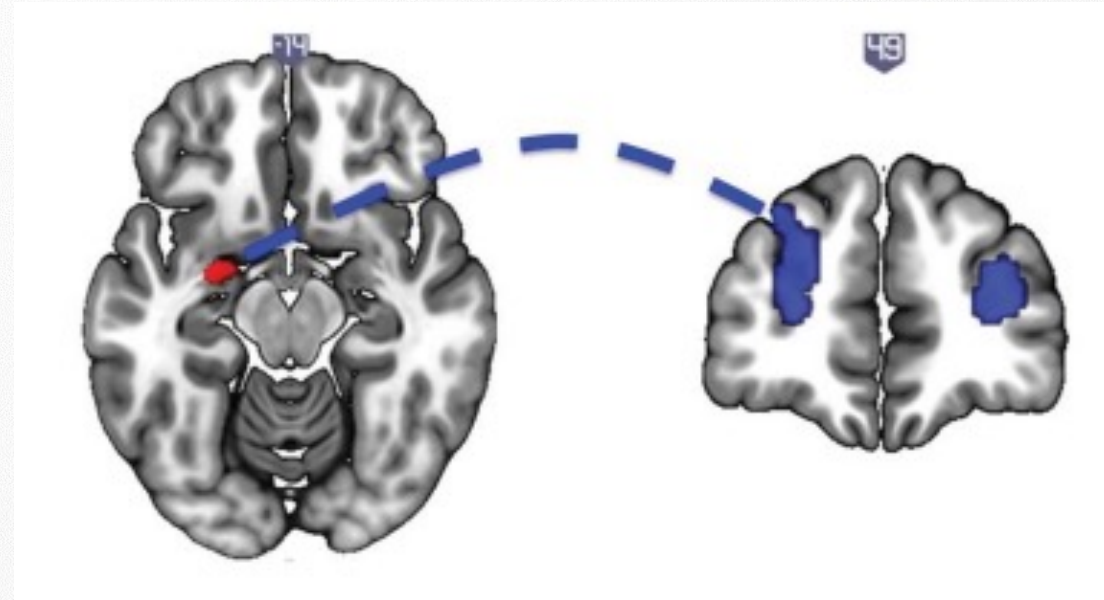
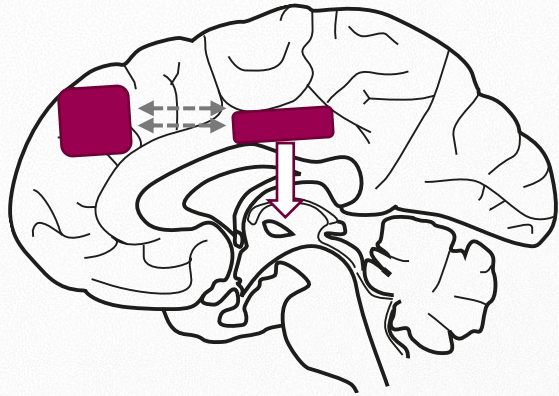
Hypothalamus:

Sexual responses in context of homeostasis

**generic brain systems
necessary for sex**

*arousal
reward
attention
behavioral inhibition
etc.*

Control



Schmidt et al., Hum Brain Mapping 2017

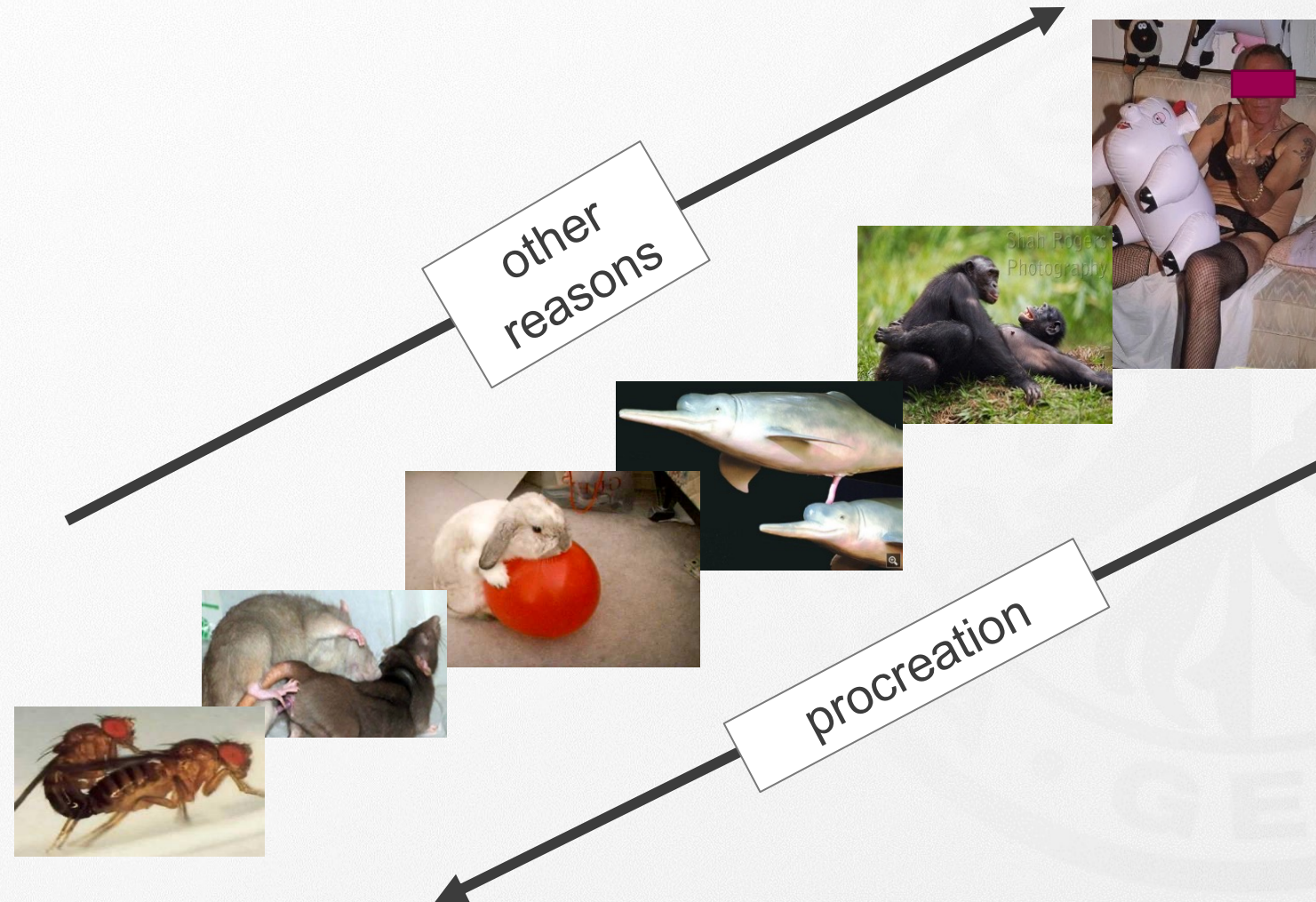
- **Sexually impulsive men**, i.e. with poor perceived control over sexual urges, **have weaker prefrontal– limbic connectivity**

Why?

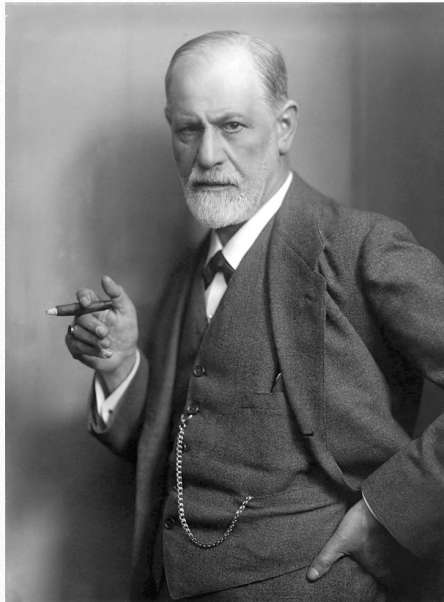


Procreation as a by-product of sexual behavior?

- Immediate effects
 - experience/feelings
 - possible gains (resources, psychological, social)
- Ultimate effects
 - Reproduction and procreation
 - Enhancing genetic variation in the species



Where does sex begin?



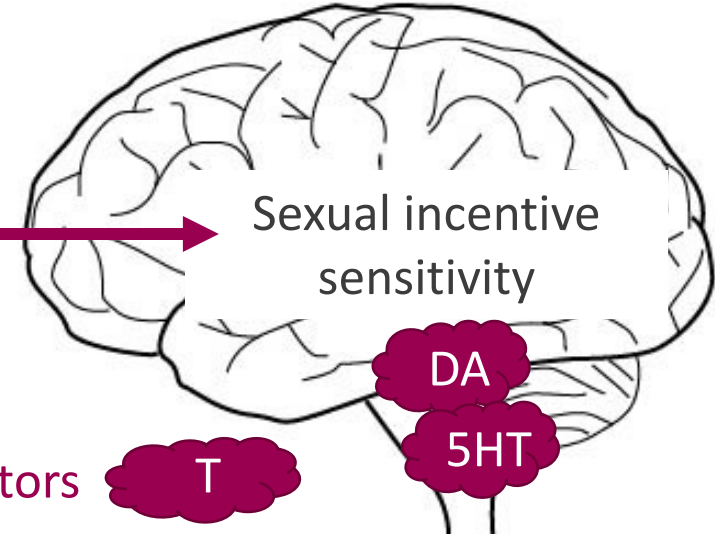
Libidinous concepts

Incentive motivation theory

Sexual
incentive



Sexual incentive
sensitivity



neuromodulators

T

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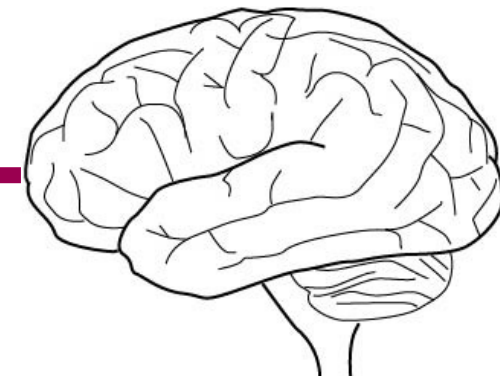
5HT

Active inference theory

priors

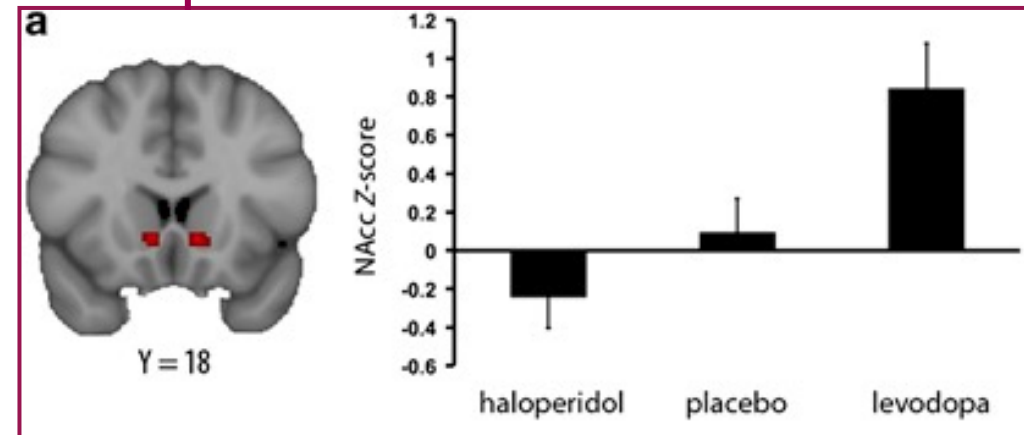
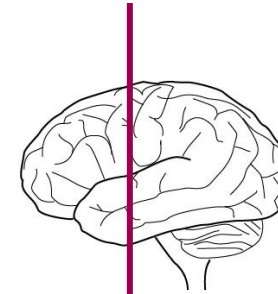
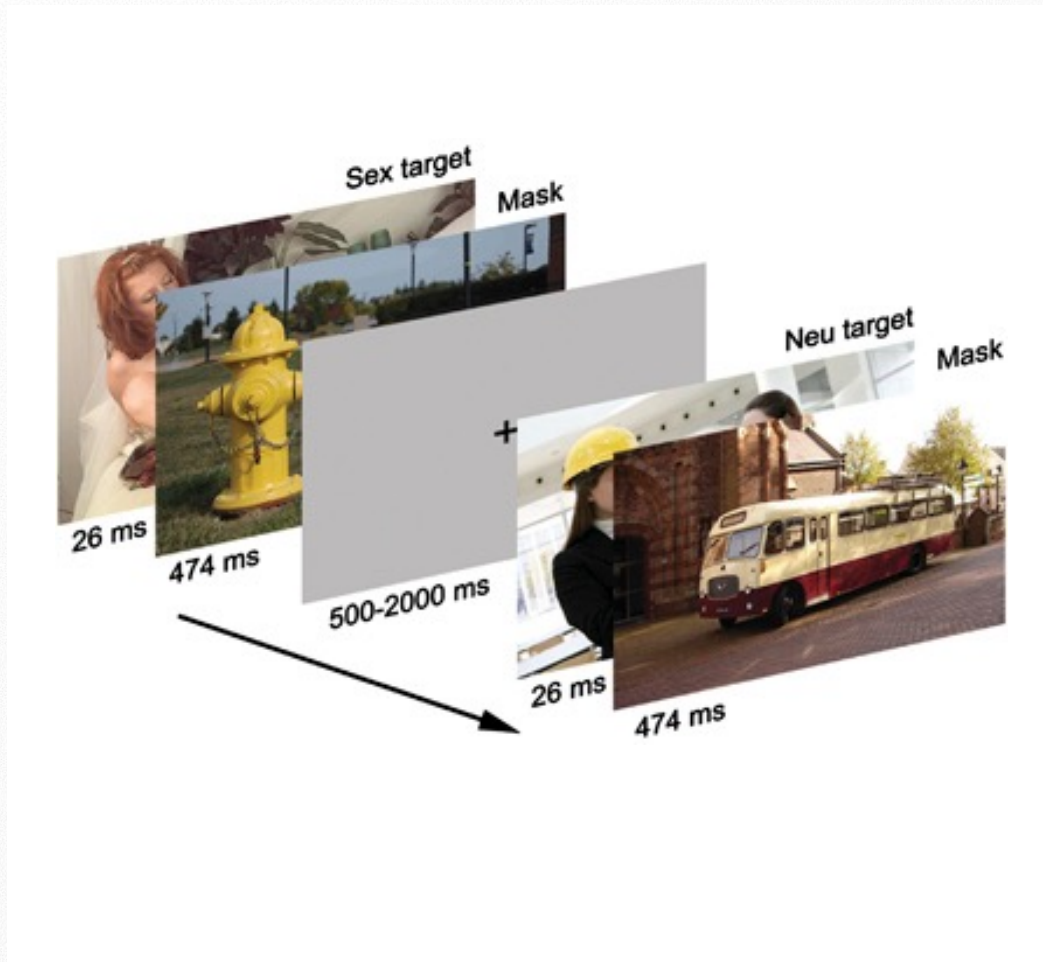


expectancies
assumptions

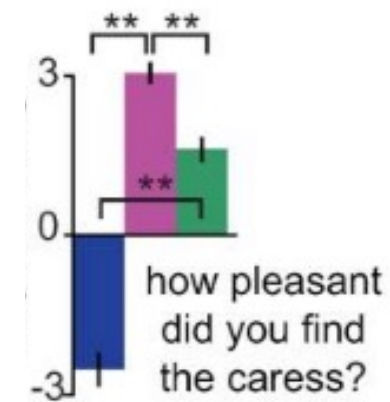
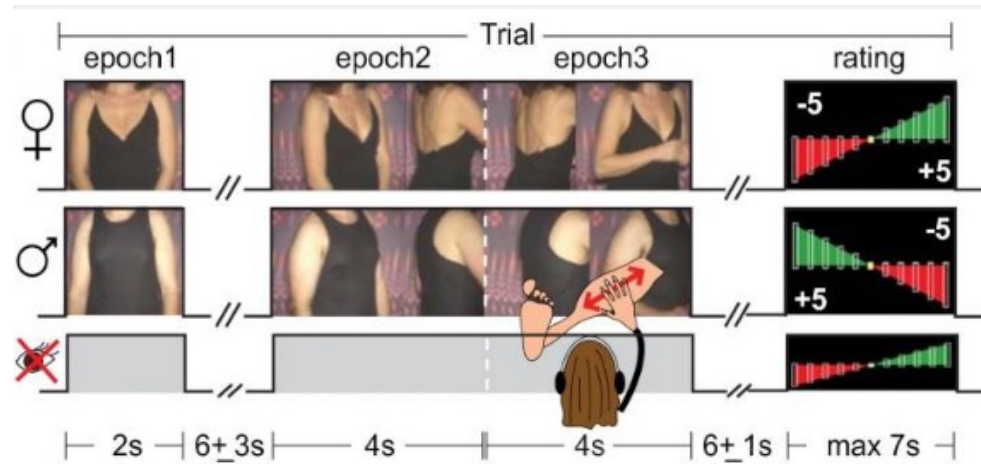


More modern ideas emerging from neuroscience

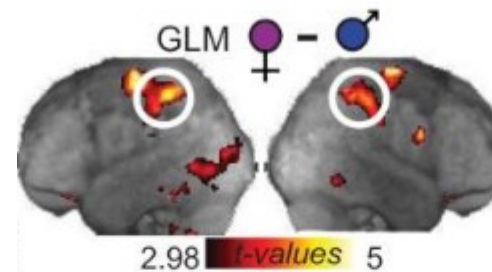
Dopamine enhances sensitivity to sexual stimulation



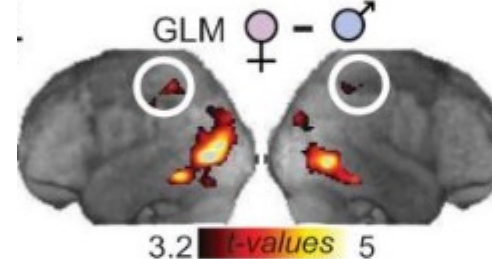
Brains predict the future



Caress

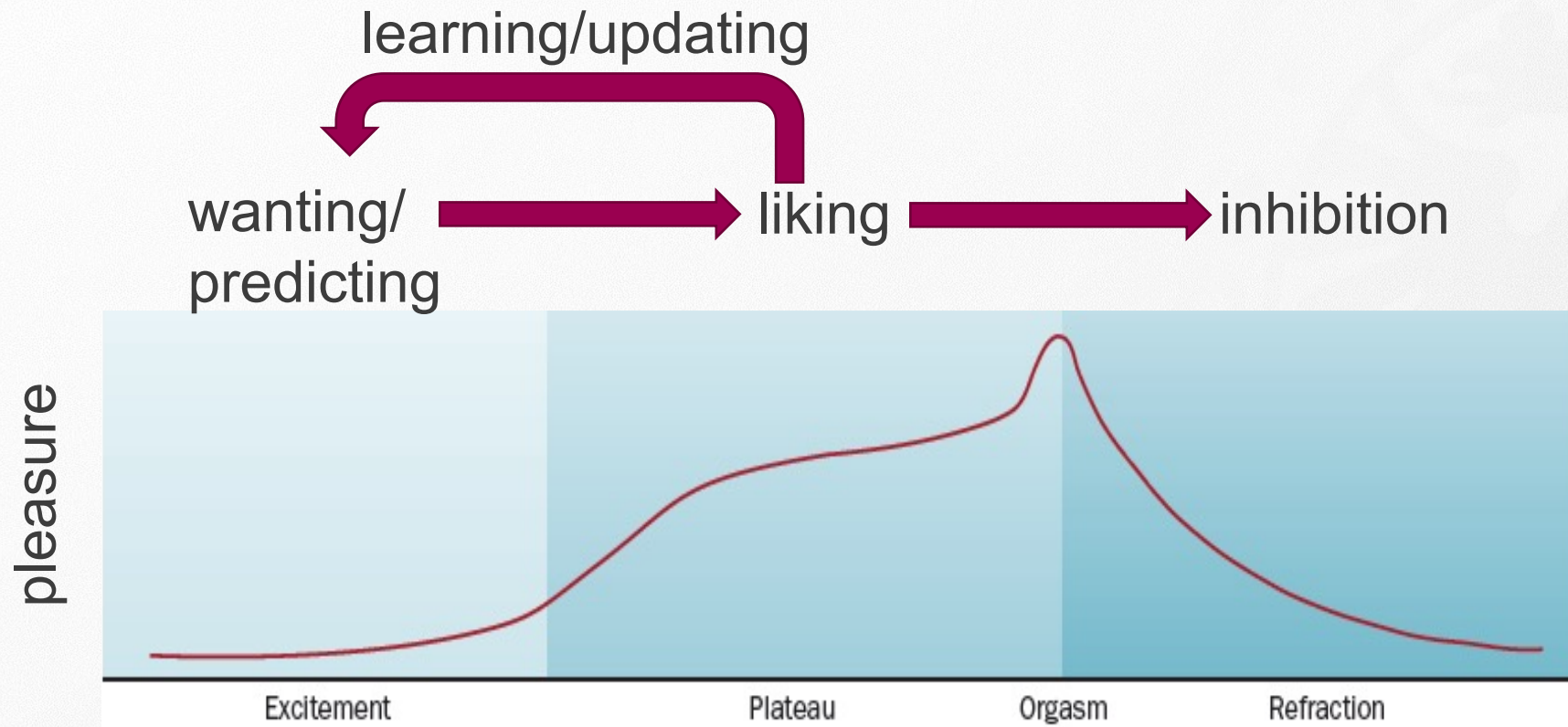


Expectation



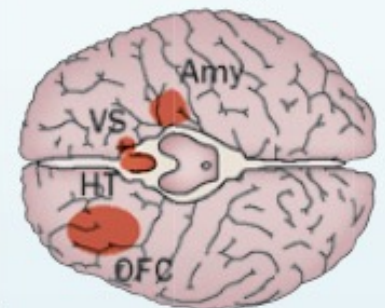
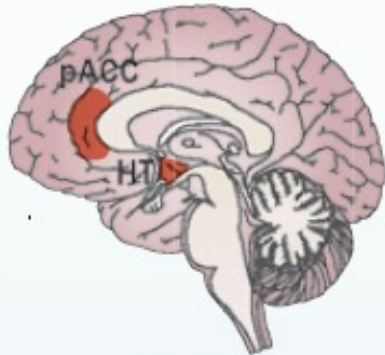
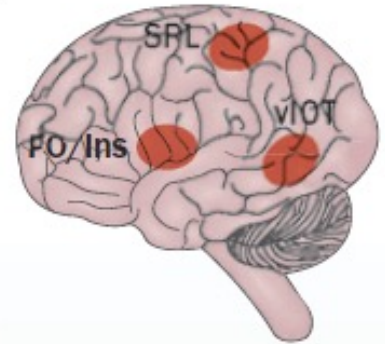
Gazzola et al., PNAS 2012

Sexual pleasure cycle

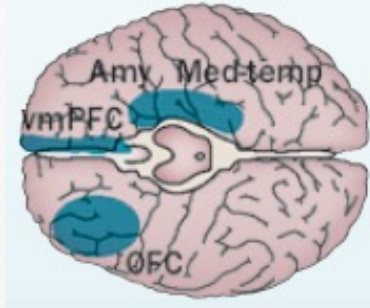
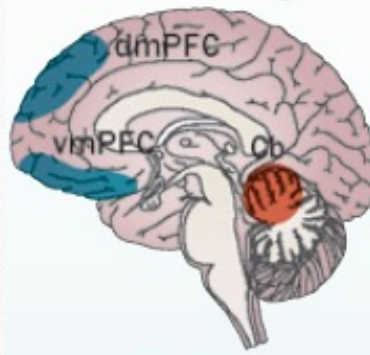
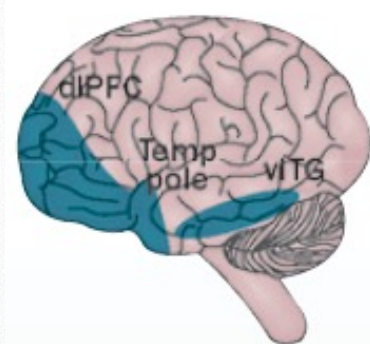


Shifting gears through brain networks?

Wanting:
expectancy
desire



Liking:
arousal
orgasm



**Affected in sexual
dysfunction?**

**Affected in
paraphilia?**

Gender differences?

Take Home Messages

- Reproduction is generally not why you have sex
- The way you experience sex is extraordinarily important
- Your brain needs to be sufficiently sensitive to sexual stimuli
- Many brain areas need to work together to determine when you have sex, what to do, where, and with who
- Sex is not passive, but is actively inferred.

MERCI! QUESTIONS?

j.r.georgiadis@umcg.nl

