

# NEUROBIOLOGY AND SEXUAL DESIRE :

## Clinic and therapeutic issues



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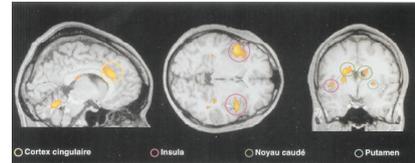


### INTRODUCTION

Although the brain is considered as the more important « sexual organ », the function of human brain in the emergence of the sexual response is not enough known. The extrapolability of new animal data to mankind is a problem.

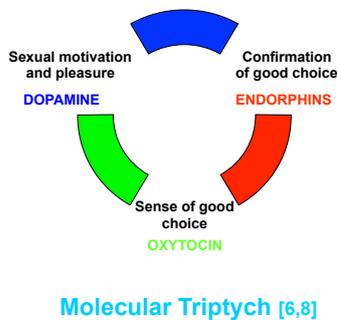
#### Neurobiology

At present, many neuroscientific researches [1,2,4,5] allow us to understand the processes active in the sexual behaviors (emotional and cognitive). Indeed, the « **loving modules** » are located in four areas with particular functioning [1]. The cingular cortex plays a part in emotions and feelings self-other recognition (**empathy**), the insula integrate sensory informations, and some parts of caudate nucleus and putamen are active by sexual excitation (**eroticism**). Moreover, the love feelings seem to inactivate some cerebral areas participating in negative emotions (fear, sadness and angry) as the right temporal area and some parts of the amygdala complex.

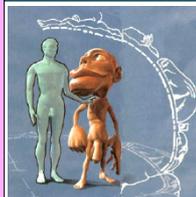


Bartels et Zeki, 2000

### NEUROCHEMISTRY



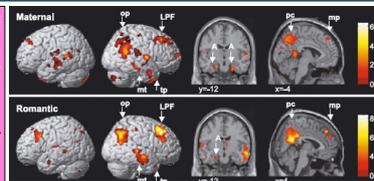
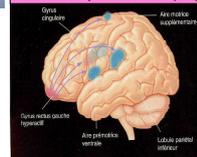
### NEUROIMAGING



**Penfield's Homunculus**, recently showed by Kell et al. [3] with new fMRI data.

**Hyperactivation in left gyrus rectus (colored in red) which inhibits the others areas essential for appearance of desire (colored in blue) :**

- bilateral supplementary motor area (SMA)
- Left ventral premotor area
- left cingular gyrus
- left inferior parietal lobule (IPL)



**Deactivated regions with maternal and romantic love.** Abbreviations: A = amygdaloid cortex, pc = posterior cingulate cortex, mp = mesial prefrontal/paracingulate gyrus, mt = middle temporal cortex, op = occipitoparietal junction, tp = temporal pole.

In romantic love (viewing loved partner vs. friends) (bottom) and in maternal love (cO vs. cA) (top), the same area are deactivated so that loving feeling appears : areas that involve negative emotions as fear, distrust and avoidance behavior (amygdala) and areas that allow the critical social assessment and social judgment (temporal pole, posterior cingulate and mesial prefrontal cortices).

**Love is blind...**

Bartels et Zeki, 2004

### CLINIC ISSUES

#### Hypoactive sexual desire disorder [7]

##### Features :

- Initially, there is the inhibition of sexual desire secondary to an internal inhibition of the desire (unconscious psychological processes)
- Prevalence = 1-15% population
- Variable duration: months or years
- Symptoms : not or few sexual fantasies, partial or total decrease of sexual desire
- With an impact on the quality of life (self-esteem) and some social consequences
- Disorder unexplained by the age and life personal context
- Without psychiatric (depression, drugs) and/or somatic comorbidities, and side effects medicine
- The role of history of Major Depressive Episode
- Reduction in libido associated with 50 percent of cases with erection disorder

##### Explanatory hypothesis :

- Interpersonal difficulties with one or many partners
  - Contextual anxiety (sexual relation)
  - Unconscious reduction of the intensity of sexual desire by focusing on aspects perceived as negative in potential partners
- Search for aesthetic faults even in the most beautiful bodies*

**Dysfunction of cerebral mechanisms involved in regulation of level of sexual motivation**

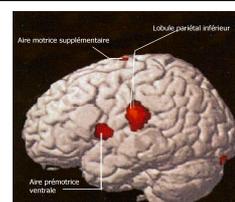
##### Functional Neuroimaging :

- Hypothesis : excessive unconscious inhibition of natural desires
- Affective traumatism**
- Negative Experiences**
- Education**
- 2 types of impairments :
  - Excess of desire inhibition** (orbito-frontal cortex : OFC)
  - Lack of fantasmatic imagery** (parietal and premotor area)



**Left gyrus rectus active in hypoactive sexual desire disorder (during sexual visual stimuli)**

**Deactivation in individual without clinic disorder, so allowing the appearance of desire**



Stoleru et al., 2003

### THERAPEUTIC ISSUES

#### Erection disorder

Action target according to type of damaged phase of cycle (rest, starting, maintained erection)

#### Hypoactive sexual desire disorder

It remains accessible to technical psychotherapies. The latter include the identification of frustration periods obstructing to anticipate a pleasure experience and the behavioral-cognitive techniques (cerebral neuroplasticity)

### CONCLUSIONS

- The loving marks appear in the brain. **The brain influences our sexual desire.** This influence can be done on the both senses : **activation or inhibition.**
- **Our imagination can raise our desire** (fantasies). But, our desire also depends on our education, our life experience and our current situation.
- Sexual desire could have two origins : either sensory organs, or imagination, or usually the both.

### REFERENCES

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