

Role of endogenous opioid system for human reward

Siri Leknes

What the tabloids know



MORO MED **ENDORFINER**: En god latter gjør deg lett og glad. Her er det justisminister Knut Storberget, Høyres Jan Petersen og finansminister Kristin Halvorsen som morer seg på jobb. Foto:

rusfrie alternativer - her er våre ti tips til et helt naturlig **endorfin-kick**:

1) Spis chili

Denne metoden er ganske elementær. Smerte gjør deg våken og får kroppen til å gå i alarmberedskap. **Endorfinene** utløses for å slukke brannen i munnhulen, og du føler deg bedre.

2) Glade tanker

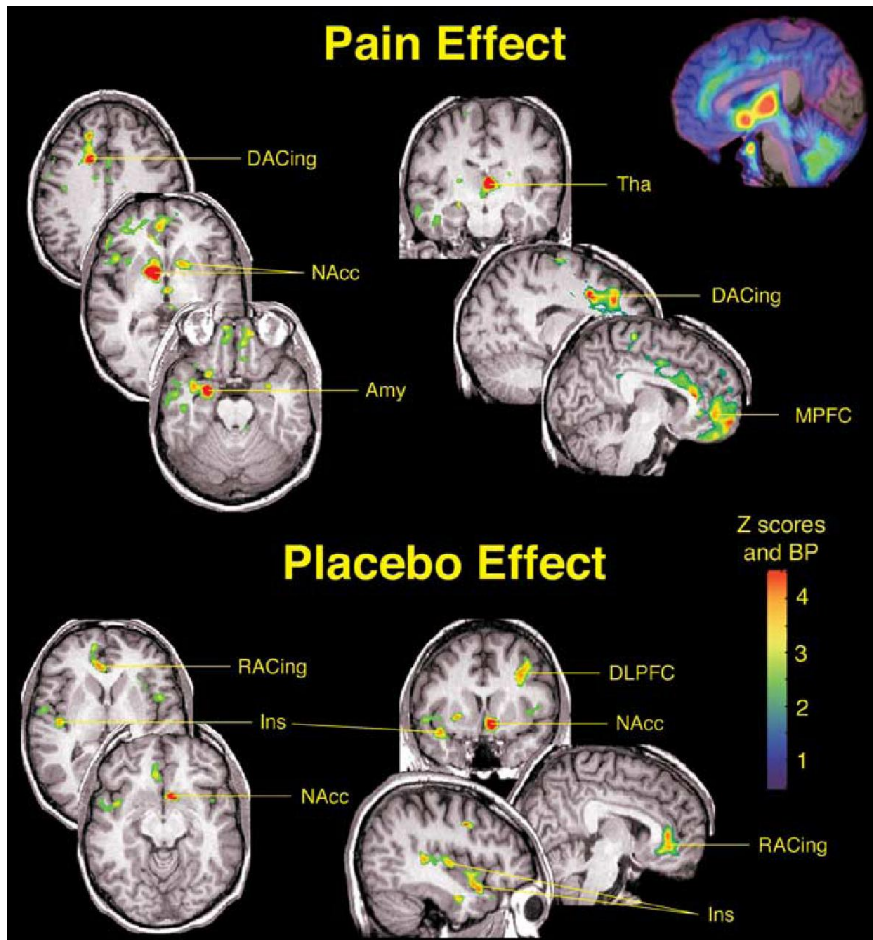
Positive tanker om noe du gleder deg til eller noen du er glad i, utløser en belønning i hjernen i form av **endorfiner**. Noen leger mener at positive tanker kan virke like bra som smertestillende tabletter.

3) Løp deg glad

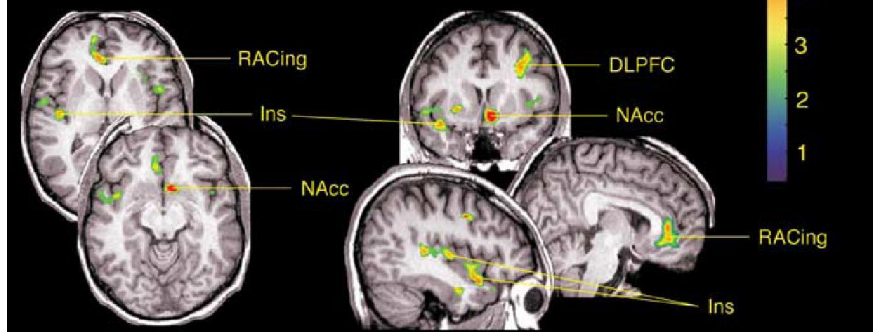
Forskerne er uenige om det skyldes den fysiske belastningen eller den mentale tilfredsstillelsen over fysisk aktivitet. Men resultatet er likevel det samme: Trening utløser **endorfiner** som gjør deg glad. En langvarig økt som jogging, sykkeltur eller en tenniskamp gir aller best effekt.

Opioid regulation of pain

Pain Effect

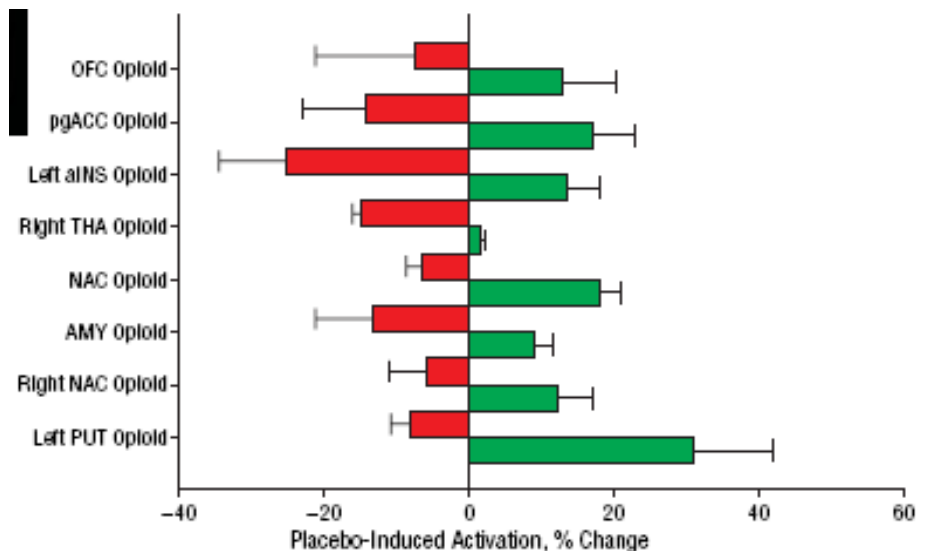
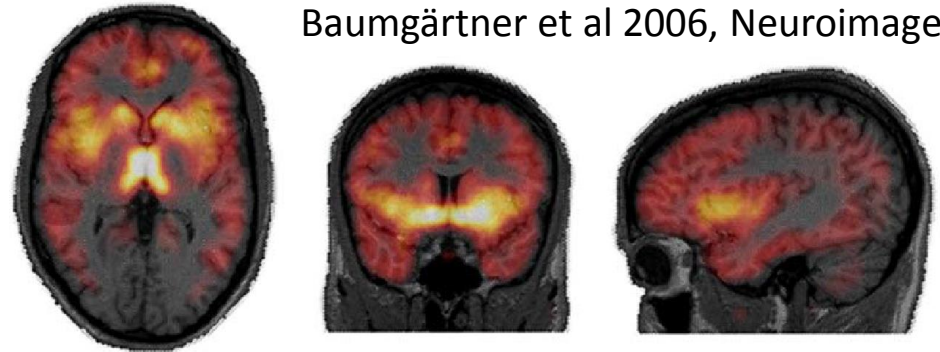


Placebo Effect



Zubieta et al 2005, J Neurosci

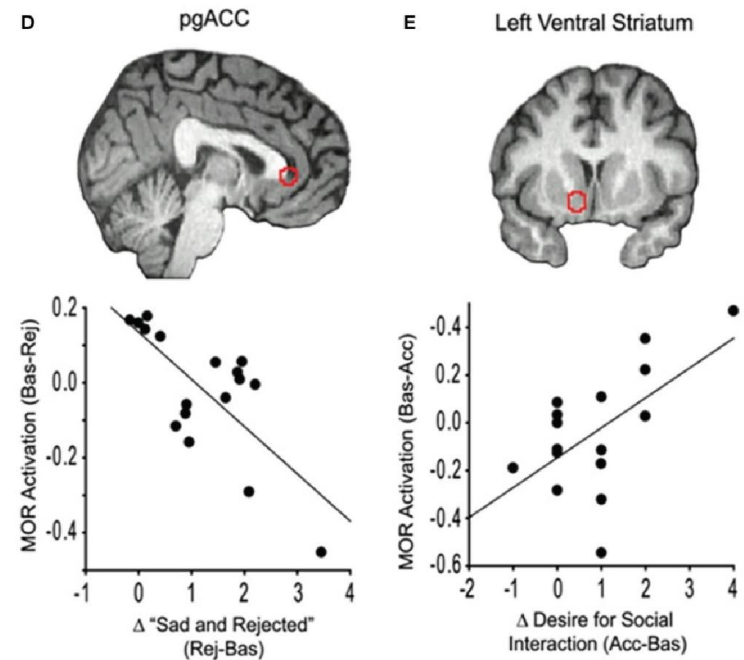
Baumgärtner et al 2006, Neuroimage



Scott et al 2008, Neuron

Opioid regulation of social emotions

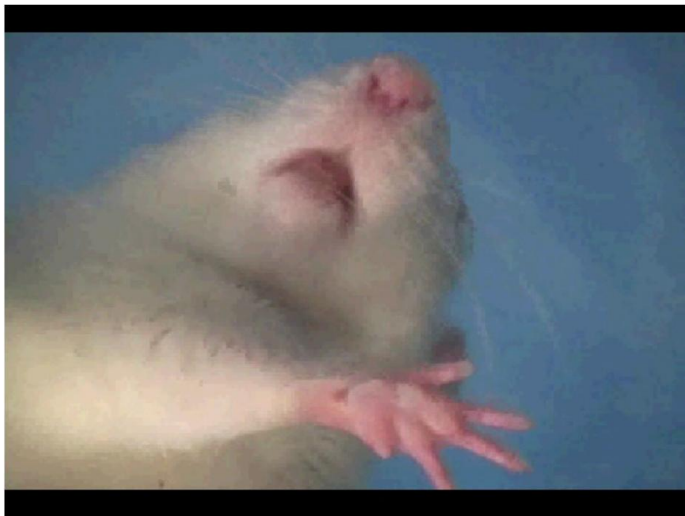
	Age: 31 Occupation: Lawyer Interests: cycling, reading, diving		Age: 28 Occupation: Manager of a coffee shop Interests: museums, traveling										
"Would I like this person?" Your response: very likely yes "Do I think this person would like me?" Your response: likely yes "Would I like this person?" Their response: definitely no													
When you think about this person's response, how much do you feel: <table border="1"><tr><td>very slightly or not at all (thumb)</td><td>a little (index)</td><td>moderately (middle)</td><td>quite a bit (ring)</td><td>extremely (pinky)</td></tr><tr><td></td><td></td><td></td><td>sad?</td><td></td></tr></table>				very slightly or not at all (thumb)	a little (index)	moderately (middle)	quite a bit (ring)	extremely (pinky)				sad?	
very slightly or not at all (thumb)	a little (index)	moderately (middle)	quite a bit (ring)	extremely (pinky)									
			sad?										



Opioid regulation of reward

Animal research

- Motivational and hedonic aspects of reward
- Opioid drugs modulate high-value reward motivation
 - Food
 - Partner

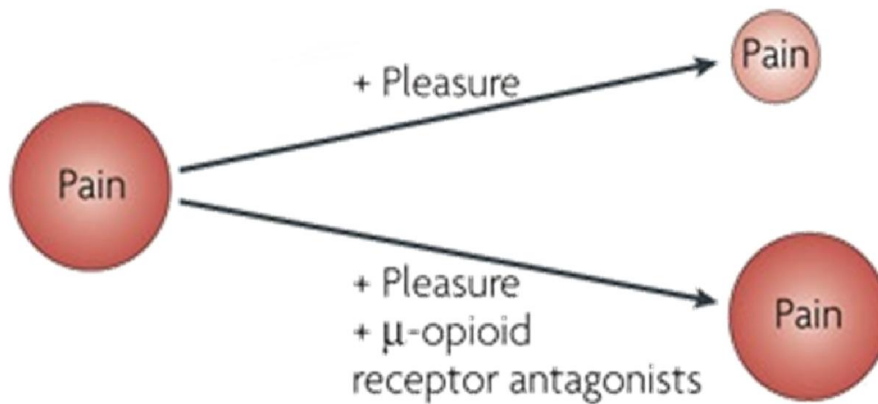


Human research

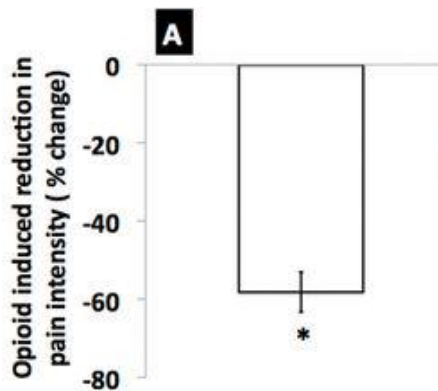
- Addictive drugs
- 'Runner's high' euphoria
- Naltrexone reduces food liking and consumption.
 - Especially high-value food reward



What is the μ -opioid system for?



Leknes and Tracey, 2008, Nat Rev Neurosci;
Liljenkranz et al, submitted

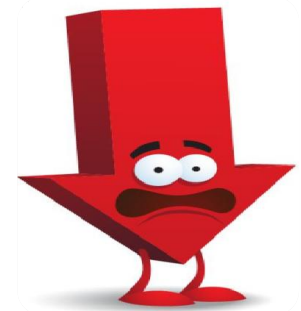


Wanigasekera et al, 2013, PNAS

Opioid effects on reward behaviours



10 mg
morphine



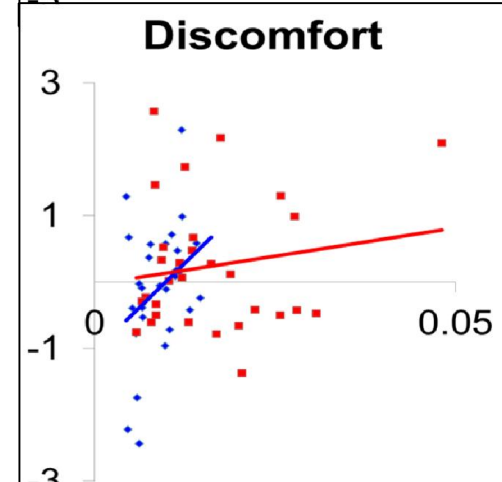
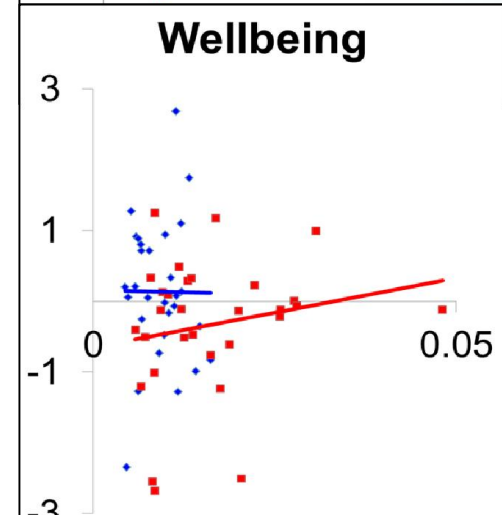
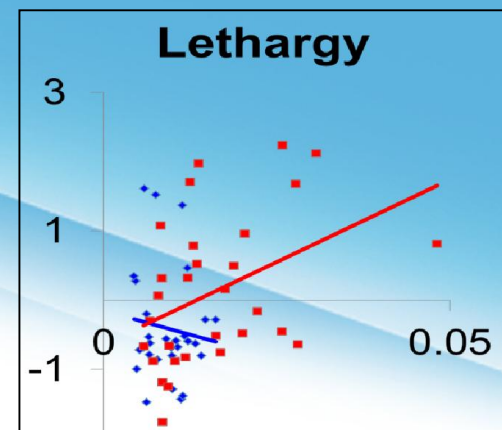
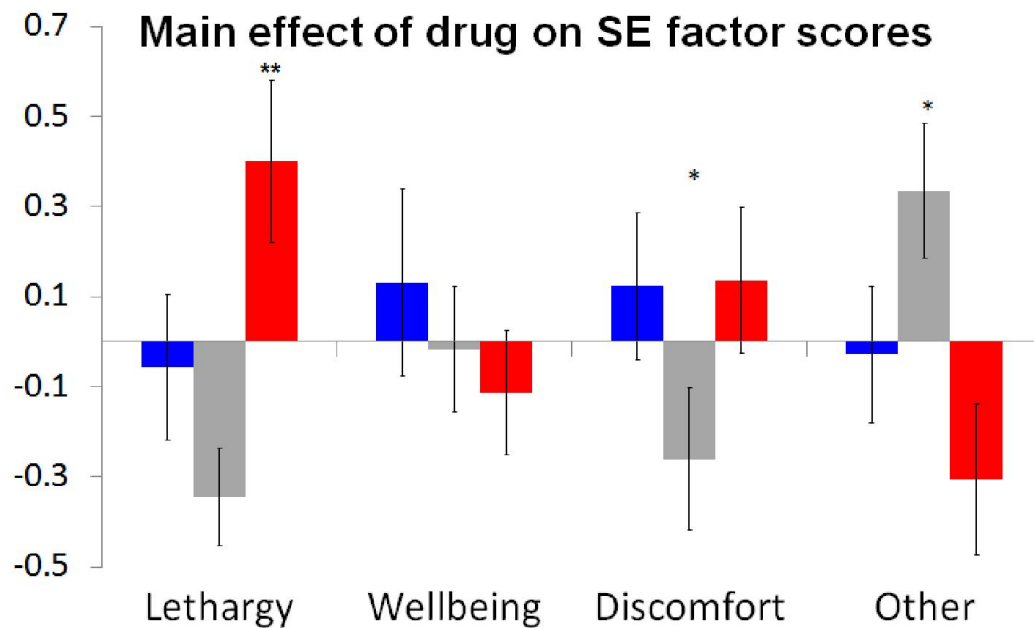
50 mg
naltrexone

- N=30 males within-subjects

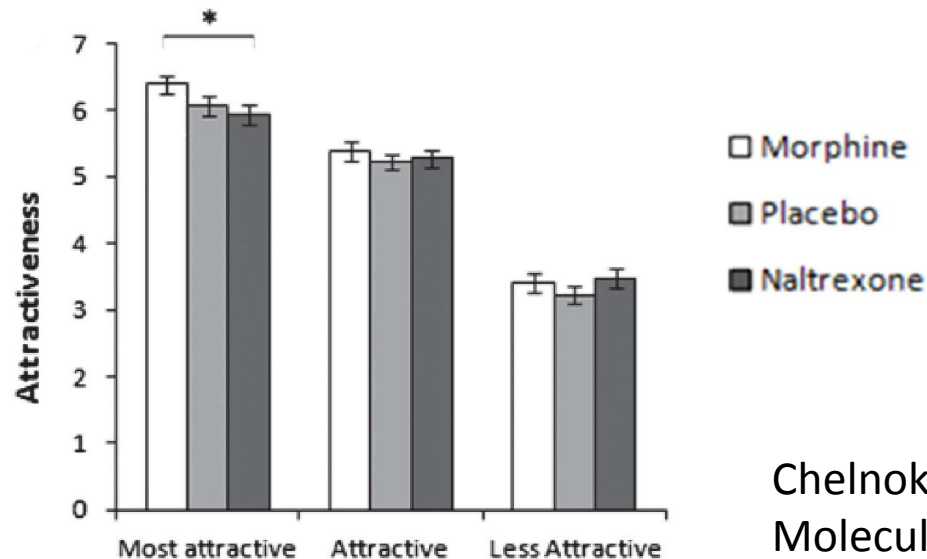
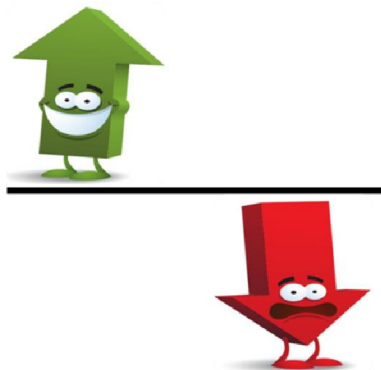


Drug blinding was successful, only 34% correct guesses

■ Morphine ■ Placebo ■ Naltrexone



Rewards of beauty: the opioid system mediates social motivation in humans



Chelnokova et al. 2014,
Molecular Psychiatry

How do we typically look at faces?

- Why attend to the eyes?



Foto Per Stokkebrun

Illustrasjonsfoto. (Hesten på bildet har ikke noe med saken å gjøre og er derfor sladdet.)

Smuglet hest

ONGSVINGER: Tollvesenet stoppet onsdag kveld en hest på vei inn i landet.

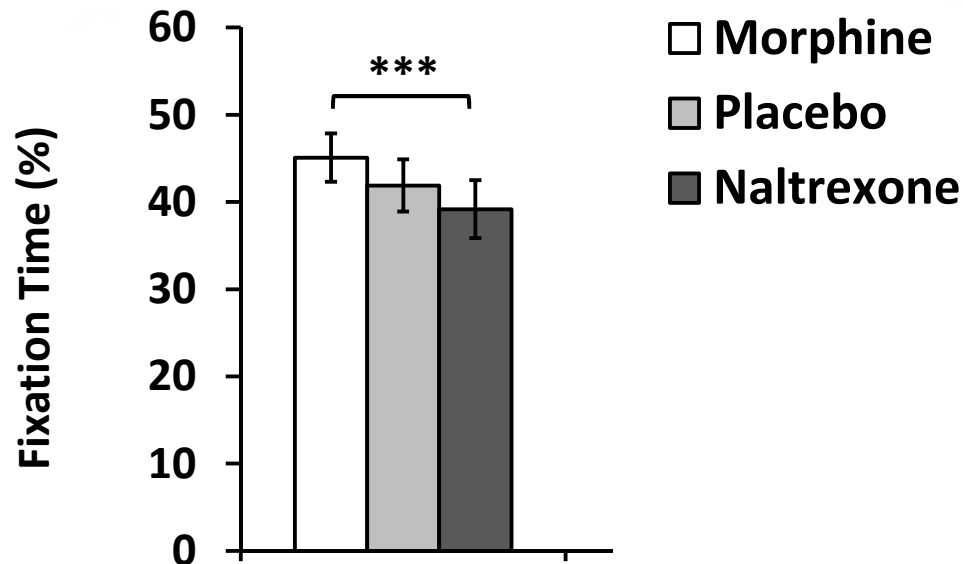
glomdalen.no

Tilførselen

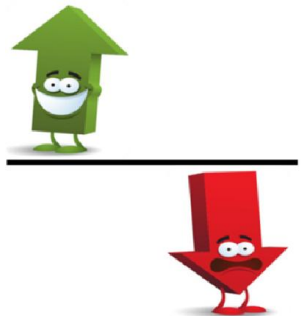
TIPS OSS:

Natt...

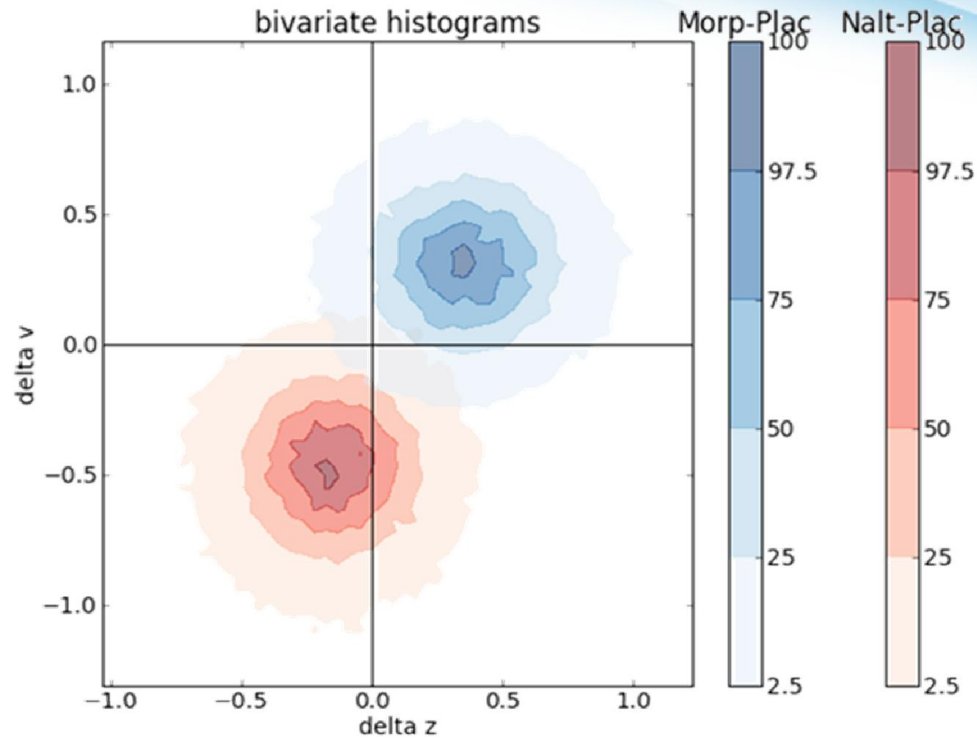
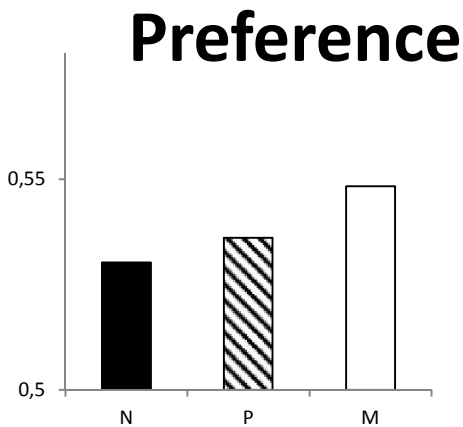
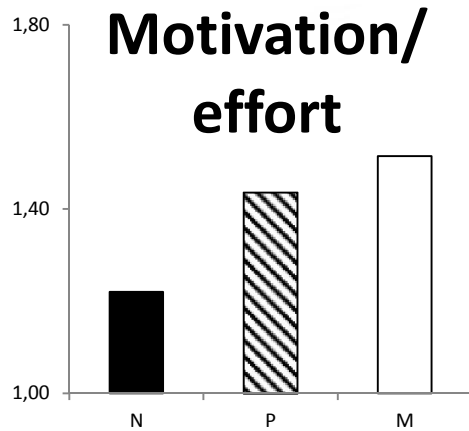
μ -opioid system promotes social attention



Becker et al, 2014
Neuropsychopharmacol



μ -opioid system promotes adaptive decision making

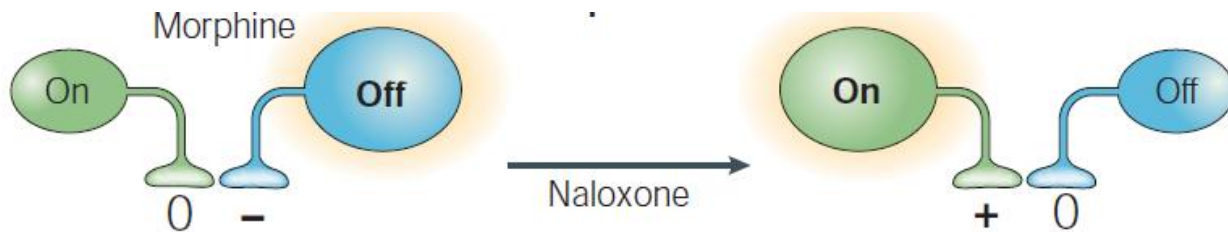


What does the human μ -opioid system do?

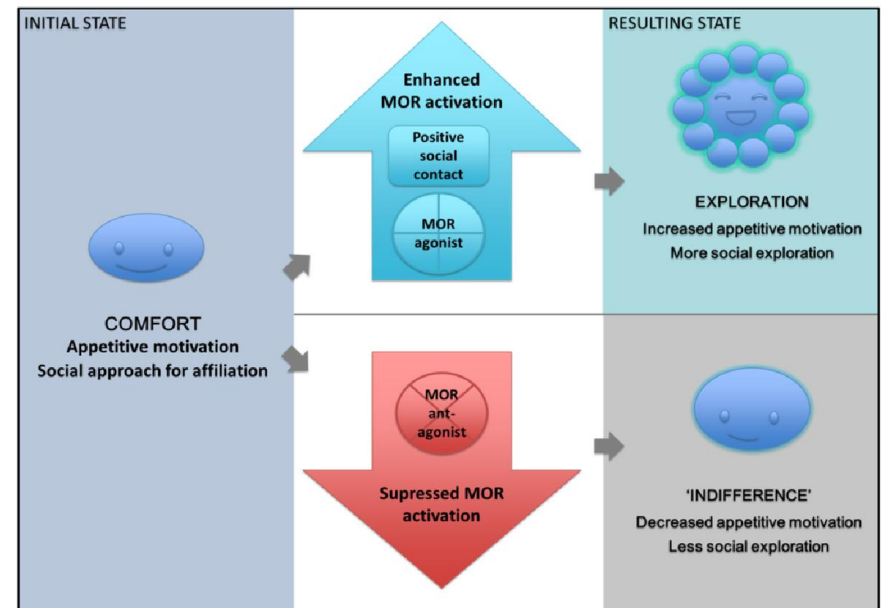
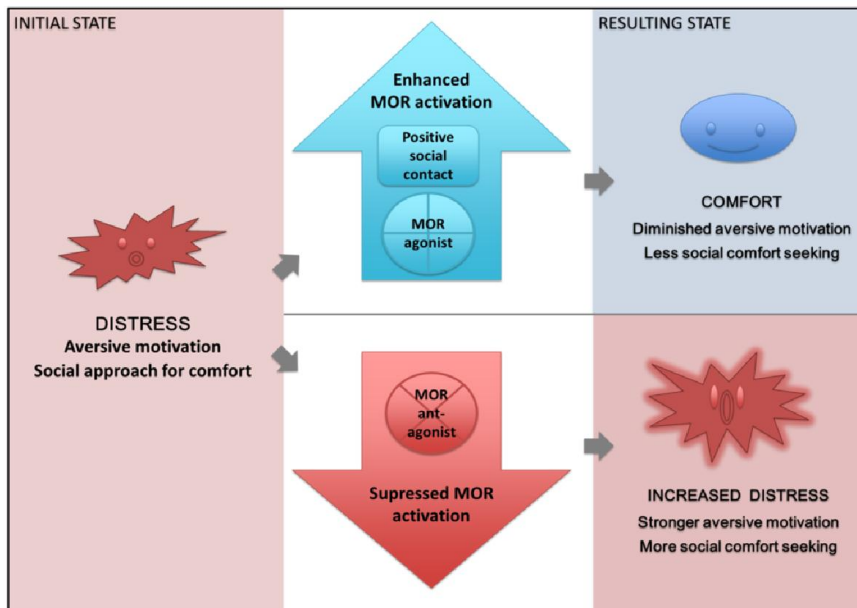
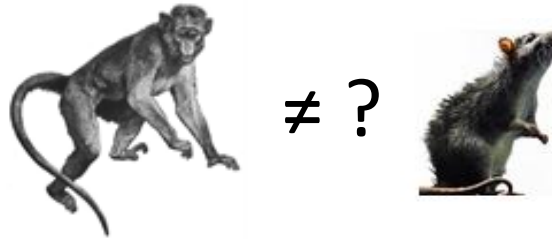
- Regulates pain and rejection
- Promotes motivation for most valuable
 - Monetary reward
 - Faces
 - Face region
 - Sweet tastes
- Clinical significance
 - Decision making and social function
 - Drug abuse
 - Chronic pain
 - Autism



State-dependent μ -opioid pain regulation



State-dependent μ -opioid modulation of social motivation





Bruno Laeng
Lotte Thomsen
Guido Biele
Tor Endestad



Frode Willoch
Trine Hjørnevik



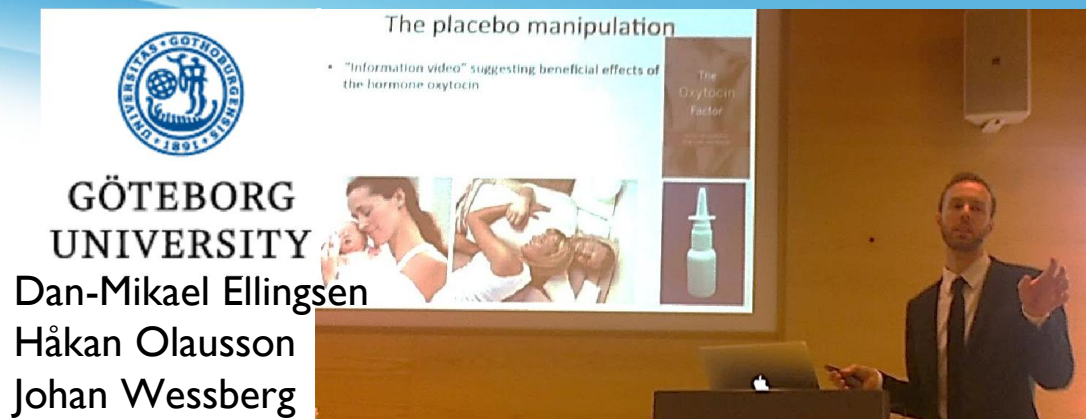
Vigdis Vindenes
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Liliana Bachs



Thank you

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Guro Løseth
Jeppe Riegels
Hedda Maurud



Irene Tracey
Michael Lee
Chantal Berna



Opioid regulation of pleasure and positive emotion

