Dopamine D2 and mu-opiate receptors in the reward system of detoxified alcoholics

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Glutamate stimulates

GABA inhibits

The monoaminergic systems arise from the brainstem and modulate neurotransmission in the CNS

Doudet et al., Am. J. Psychiatr. 1995
Chronic alcohol intake
High relapse risk in alcoholics with prolonged recovery of central dopamine receptor sensitivity

Heinz et al., submitted
Dopamine D2-receptor availability and craving

Plot of the correlation at xyz 16 / 14 / -6
Schultz et al., 1993
For presentation
P<0.001
uncorrected
Heinz et al., submitted

**Alcoholics**

<table>
<thead>
<tr>
<th>ventral striatum (V3)</th>
<th>mean ± SEM</th>
</tr>
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<tbody>
<tr>
<td>-1 SD</td>
<td></td>
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<tr>
<td>+1 SD</td>
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**occipital cortex**

<table>
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<th>0-60 min. p.i.</th>
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**normalized [11C]Carfentanil concentration**

- alcoholics
- controls

Heinz et al., submitted
SPM: \( V_3'' \) versus OCDS (alcoholics)

\[ z = -12 \]
\[ y = 8 \]

Opiate receptor availability (\( V_3'' \))

alcoholics (left VS)

\[ r = 0.55, \ p = 0.04 \]
\[ r = 0.75, \ p = 0.002 \]

alcoholics (right VS)

\[ \mu \text{-Opiate-rezeptoren} \]

& Craving (OCDS)

Craving (OCDS)

\[ x = 16 \]
Summary

- Chronic „obsessive“ alcohol craving associated with increased mu-opiate receptors in the ventral striatum
- Acute alcohol craving and increased mPFC activation by alcohol-associated cues associated with reduced D2 receptors in the ventral striatum
Wilhelm Griesinger