

Operant self-administration models: how may we evaluate reward, reinforcement, abuse liability and addiction



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10-12-2020

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NEUROANATOMICAL CORRELATES







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NON-OPERANT BEHAVIORAL MODELS

Conditioned place preference as a classical model to evaluate rewarding effects







OPIOID REWARDING EFFECTS







OPERANT BEHAVIORAL MODELS





Evaluation of reinforcing effects



These models will provide direct evidence of abuse liability

Hart et al, 2000; Dick and Rashiq, 2007 Goldenberg, 2010





OPERANT SELF-ADMINISTRATION







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OPERANT SELF-MEDICATION TO ALLEVIATE SPONTANEOUS PAIN







NERVE-INJURED MICE SHOW A DISTINCT AND STABLE OPERANT BEHAVIOR elief MAINTAINED BY THE HIGH DOSE OF PREGABALIN (3 mg/kg/inf)





SELF-N SPainRelief

SELF-MEDICATION WITH PREGABALIN DECREASES NOCICEPTIVE SENSITIZATION AND ainRelief DEPRESSIVE-LIKE BEHAVIOR ASSOCIATED TO NEUROPATHIC PAIN







NEUROANATOMICAL CORRELATES







NEUROANATOMICAL CORRELATES







ARE WE EVELAUTING DRUG ADDDICTION IN THESE OPERANT MODELS?

ADICCION

DRUG CONSUMPTION (ABUSE LIABILITY): searching for the reinforcing effects of drugs

CONTINOUS CONSUMPTION MAINTENANCE (ABUSE LIABILITY): Avoidance of the negative consequences in the absence of the drug

ADDICTION: LOSS OF CONTROL, COMPULSIVE SEARCH, RELAPSE





COMMON NEUROBIOLOGICAL SUBSTRATE OF THE REWARDING EFFECTS OF THE DIFFERENT DRUGS OF ABUSE



Acute administration of different drugs of abuse:

Enhancement of the dopaminergic and opioid activity in the mesolimbic system



OPPONENT PROCESS THEORY



Koob et al., Neurosci Biobehav Rev, 1989



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COMMON NEUROBIOLOGICAL SUBSTRATE OF THE NEGATIVE CONSEQUENCES OF DRUG ABSTINENCE



Drug abstinence:

Decrease of dopaminergic activity in the nucleus accumbens





COMMON NEUROBIOLOGICAL SUBSTRATE OF THE NEGATIVE CONSEQUENCES OF DRUG ABSTINENCE



Drug abstinence:

Enhancement of CRF activity in the amygdala

Richter and Weis, 1999





COMMON NEUROBIOLOGICAL SUBSTRATE OF THE LOSS OF CONTROL







COMMON NEUROBIOLOGICAL SUBSTRATE OF THE LOSS OF CONTROL

Brain activity in healthy volunteers and cocaine addicted patients



Volkow et al., Nature Rev, 2005





MORPHOLOGY OF DENDRITIC FIELDS IN NEURONS FROM THE CORTEX OF MICE CHRONICALLY TREATED WITH COCAINE



Ballesteros-Yañez et al., 2007





ADDICTION



Koob and Volkow, 2016 Moore et al., 2017





OPERANT ADDICTION MODEL

Addiction criteria







ADDICTION









Deroche-Gamonet et al., 2004 Mancino et al., 2015





FOOD ADDICTION



Drawing of Elena Martín-García in Cabana et al. 2020, Neuropsychopharmacolgy

