

STREET DRUG PHARMACOLOGY: Module I

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ESSENTIAL ISSUES IN UNDERSTANDING STREET DRUG PHARMACOLOGY

- **Psychoactivity**
- **Dependence**
- **Tolerance**
- **Toxicity**
- **Psychiatric Impairment**
- **Set and setting**
- **Substance misrepresentation/misidentification**

Psychoactivity = ability to affect mood, thinking and/or behavior

CONTROLLED SUBSTANCES

- Schedules I-V
- Schedule I: High potential for abuse, tendency to produce dependence, no accepted medical use in US
- Schedules II-V: Potential for abuse, tendency to produce dependency, does have accepted medical application

SCHEDULE I SUBSTANCES

- LSD
- Heroin
- Cannabis
- PCP

SCHEDULE II SUBSTANCES

- **Morphine**
- **Cocaine**
- **Short-acting barbiturates**
- **Amphetamines**

DESIGNATED PRODUCTS:

State of Illinois

● **Schedule II substances with a higher potential for abuse and addiction**

- **amphetamines**
- **cocaine**
- **short-acting barbs**
- **methadone**
- **morphine**
- **OxyCodone**

DRUG NAMES

- Chemical (7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepin-2-one)
CN1C=NC2=C1C(=C(C=C2)C(=O)N3C(=CC=C4C3=CC(=C4)C)C5=CC=CC=C5C5=CC=CC=C4)C
- Generic: diazepam
- Brand : Valium
- Street: No common street names for Valium

DRUG MEASUREMENT

● metric:

- micro = 1/1,000,000.
- Microgram (mcg./ μ , also called a "gamma") = 1/1,000,000 gram)

● Street

- nickel/nickel bag & dime/dime bag = \$5 or \$10 worth of drug
- eightball = 1/8 oz. (3.75 grams)

DRUG MEASUREMENT

● Street

- sixteenth = either 1/16 oz (1.875 gm) or 1/16 gm (62.5 mg, about three lines of cocaine)
- line = an elongated pattern of powdered drug.
Quantity = whatever the user decides.
- joint = a marijuana cigarette.

DRUG FORMS

- **plant/botanical matter** (marijuana, opium poppies, khat, coca, peyote, psilocybin mushrooms, jimson weed).
- **liquids** (alcohol, pure LSD, injectable pharmaceuticals)
- **powders** (cocaine hcl., heroin, PCP, methamphetamine)

DRUG FORMS

- **pills** (tablets, capsules, caplets of either pharmaceutical or illicit origin)
- **other forms** (ex: "rocks" of crack cocaine).

Potency, purity & misrepresentation of street drugs

- **potency** = strength, compared to some other drug of a similar type.
- **purity** = the major determinant of potency.
 - The more pure the drug, the more potent.
 - Street drugs are seldom pure, but are commonly misrepresented in one of three ways

DRUG MISREPRESENTATION

- **adulteration:** (to adulterate = to "step on"/"hit"/"dance on" "cut" a drug).
- **Substitution/misrepresentation-1:** None of the alleged drug is present, but another drug/drugs is/are.
- **substitution/misrepresentation -2:** None of the alleged drug is present, and neither is any other drug or active substance.

The Problem with Pill Identifications:



New York City May 2000 Amphetamine



Chicago May 2000 MDMA



Tucson AZ July 2000 PMA



TIME FACTORS

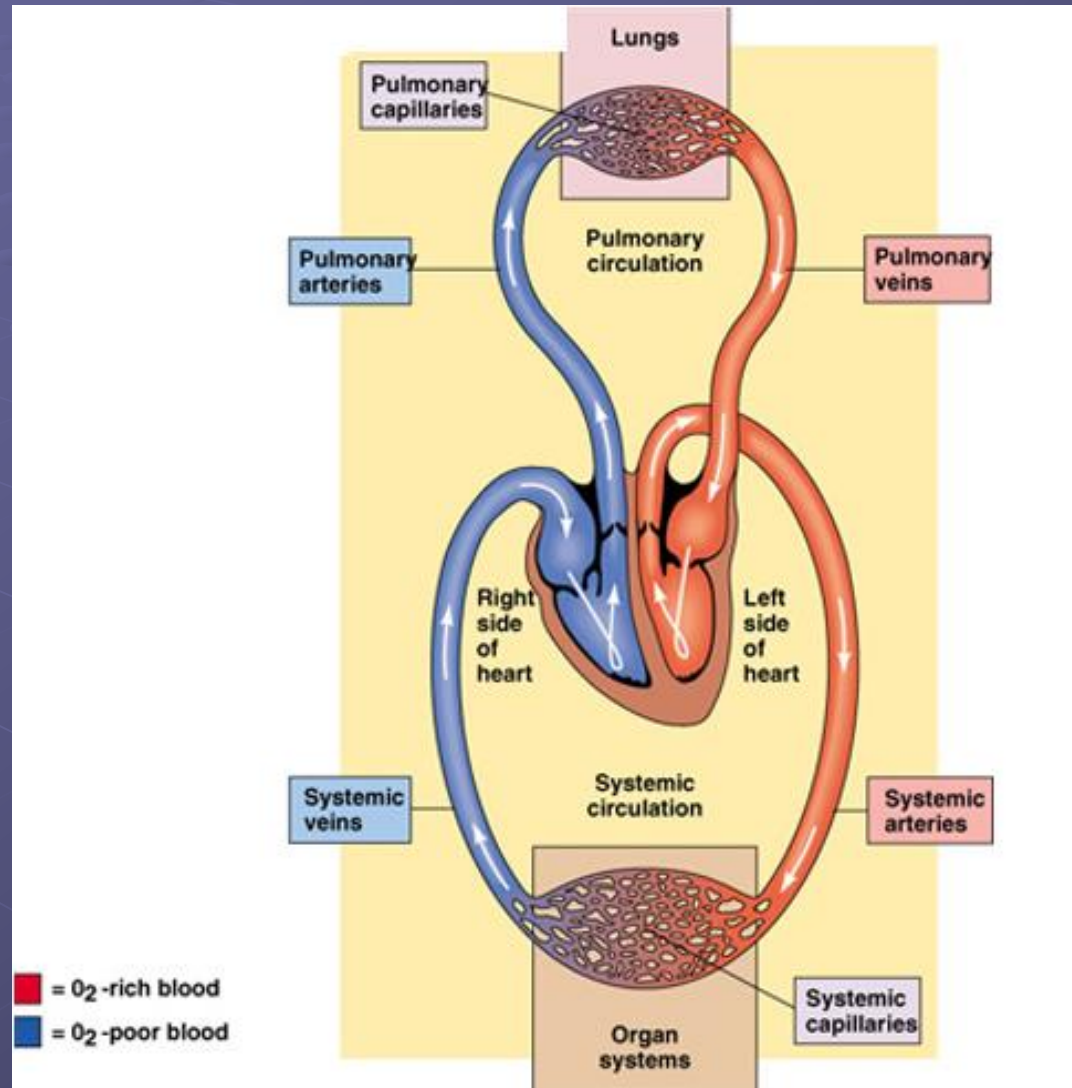
- **Onset of action:** How quickly does the drug produced it's effect?
- **Duration of action:** How long does the drug's effect last?
- **Residual effects:** After-effects, extended drug reaction, flashbacks

The route of circulation.

● Blood flows in a circle according to this pattern:

- Capillaries
 - vena cava
 - Lungs
 - Aorta
- veins
 - right side of the heart
 - left side of the heart
 - body (capillaries, etc.)

Route of Circulation



METHOD OF ADMINISTRATION

- **Ingestion (oral): slower onset/longer duration**
- **Insufflation (sniffing/snorting): faster onset/shorter duration**
- **Intravenous (I.V.) Injection: faster onset (seconds)/shortest duration**
- **Smoking: fastest onset/shortest duration**



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THE “RUSH” OR “FLASH”

**A highly pleasurable sensation
produced by the instantaneous effect
of i. v. injection or smoking***

*** If entire dose administered at once**

METABOLISM AND EXCRETION

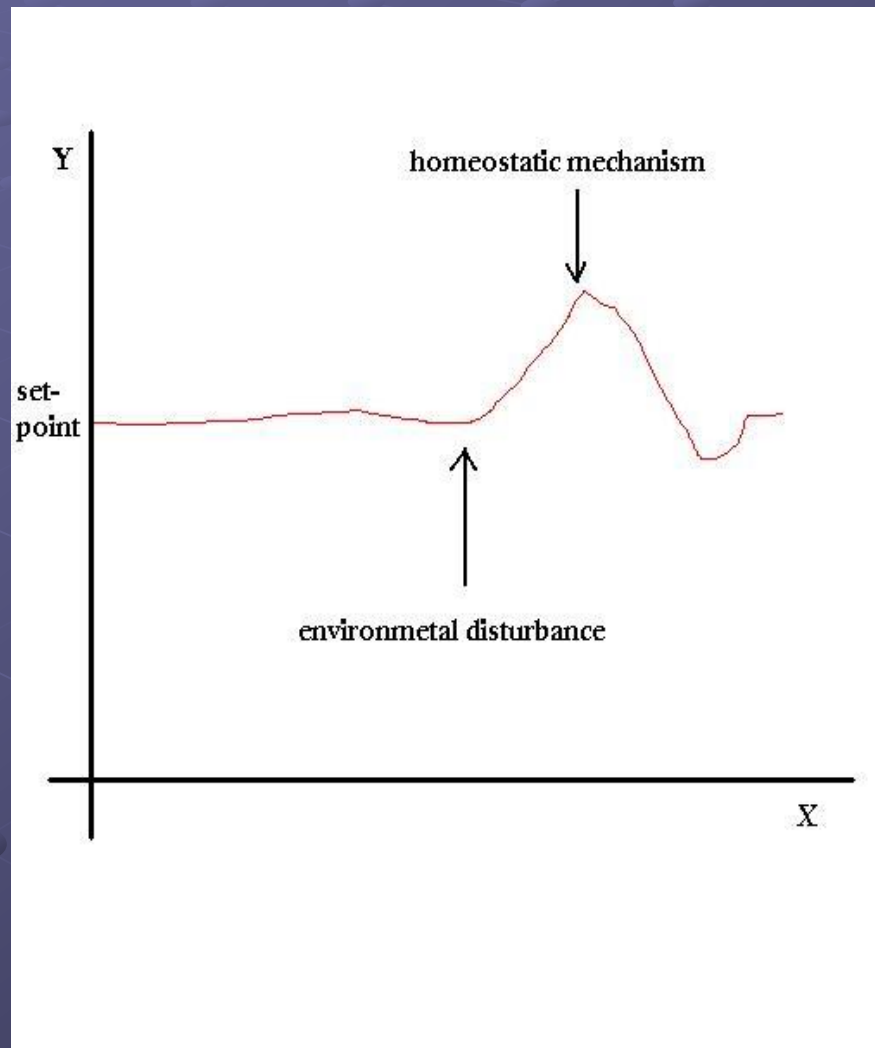
- **The break-down of a drug into simpler substances**
- **The removal of the drug from the body**

TOLERANCE

Homeostasis

The human body's natural tendency to move toward a state of equilibrium or constancy

SET POINT RESPONSE TO DRUG USE



TOLERANCE

- Need to increase the dose of a drug in order to obtain the desired effect
- Decreased effect of drug after repeated administration
- Dependent on prior dosage level
- Develops in hours (cocaine), days (LSD), or weeks

TOLERANCE

- Effective dose (ED)
- Intoxicating dose (ID)
- Lethal dose (LD)

TYPES OF TOLERANCE

- **Enzyme induction**
- **Pharmacodynamic**
- **Behavioral Need to increase the dose of a drug in order to obtain the desired effect**

DEPENDENCE

- **Addiction**

- **Physical dependence**

ADDICTION POTENTIAL

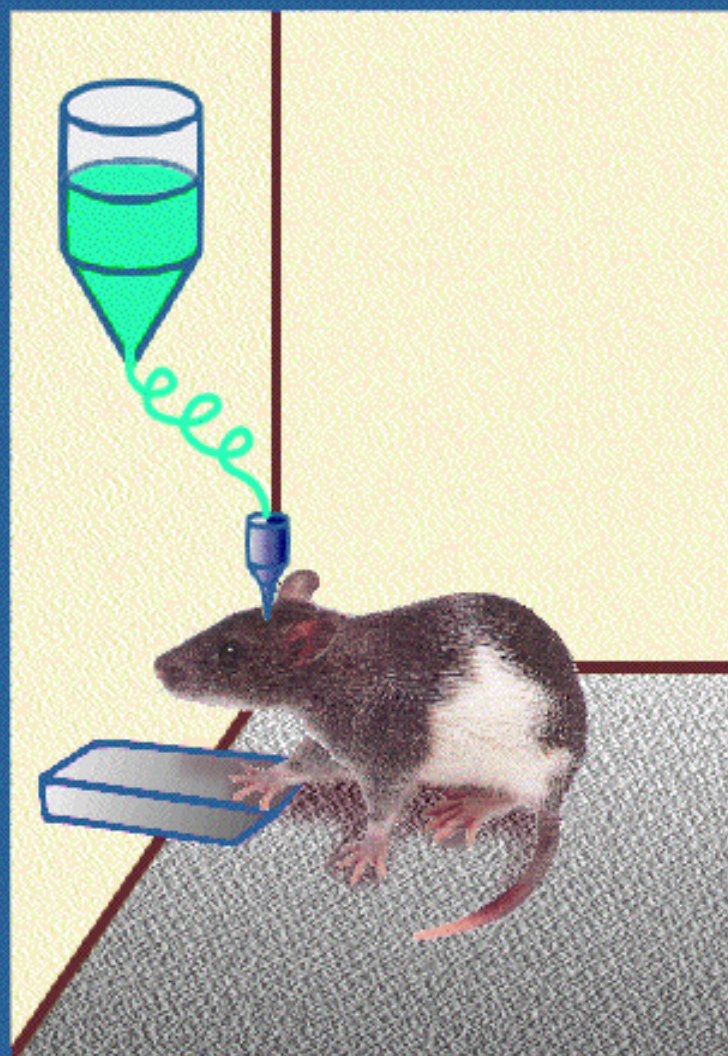
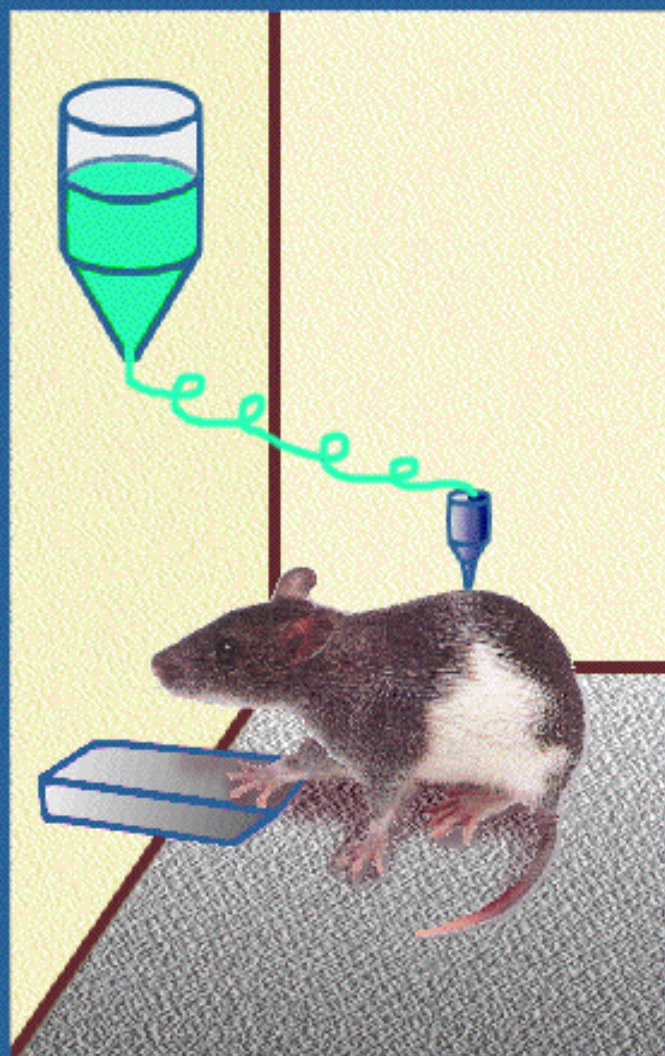
- **What percentage of first-time users will enjoy the effect of the drug enough that they will seek it out again?**
- **If an individual uses the drug on a regular basis, how likely is it that s/he will become dependent on the substance?**

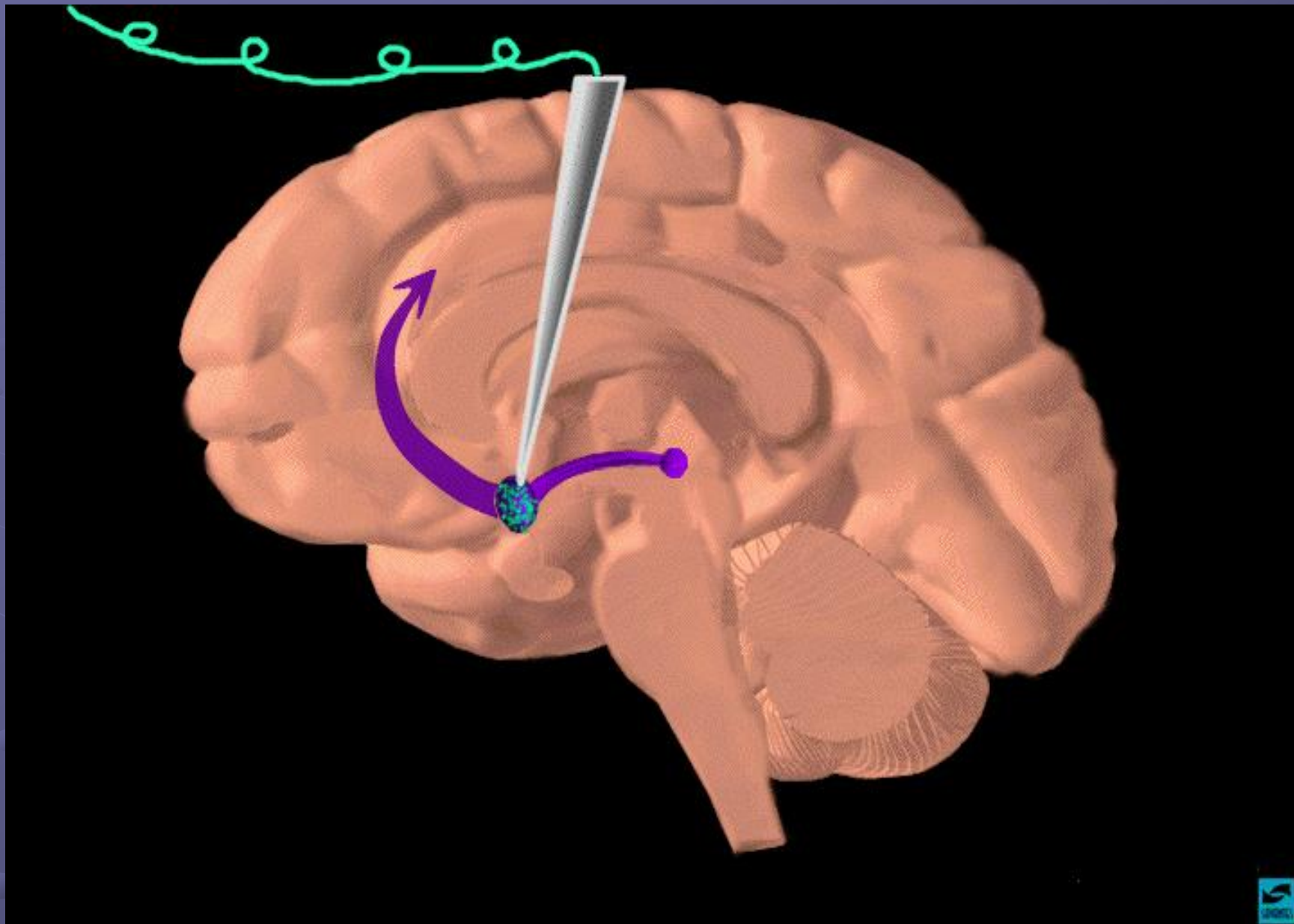
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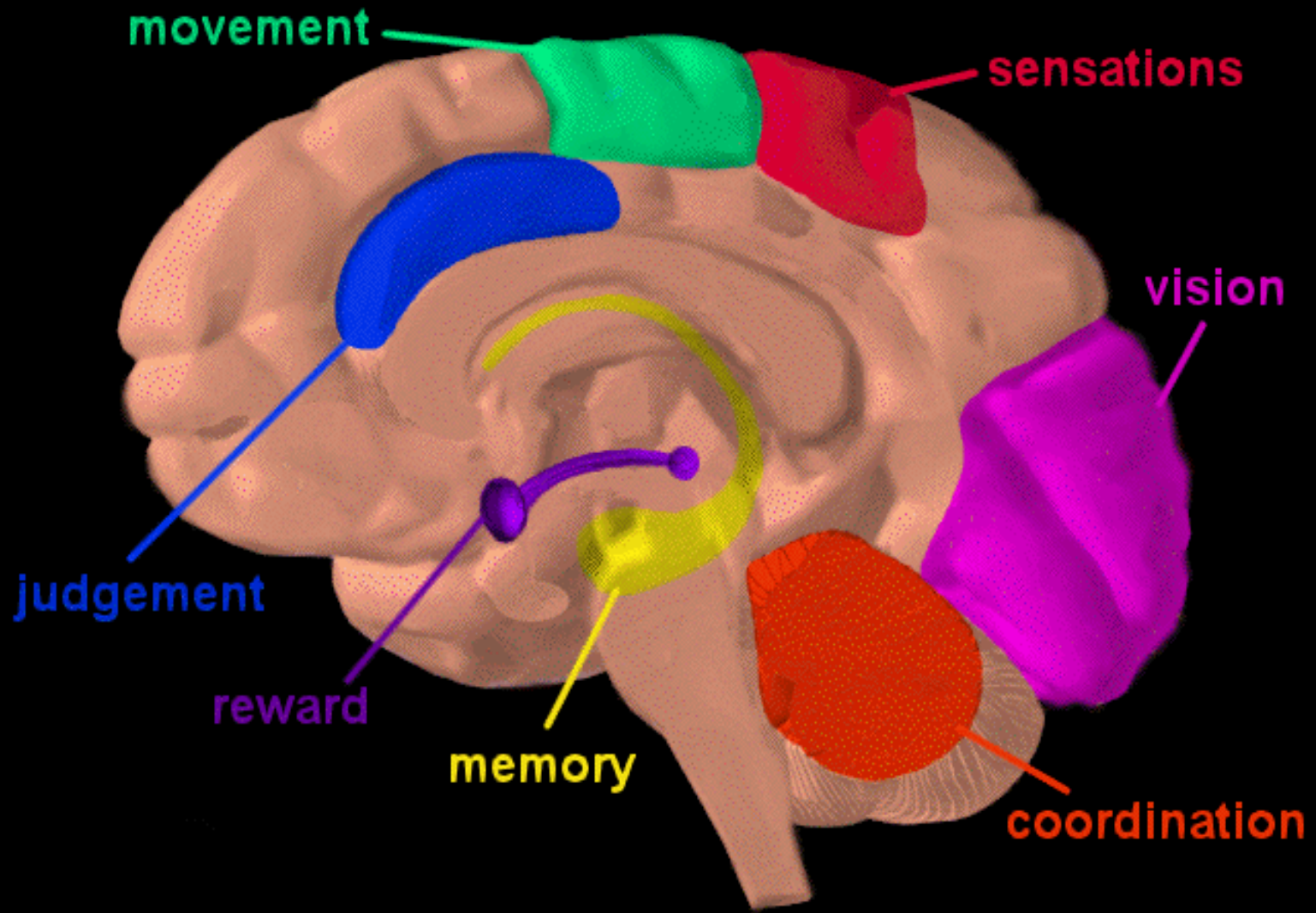
- After being introduced to the drug, do sub-human animals (e.g., monkeys, rats, mice) seek out opportunities to self-administer the substance? Do they do so to the exclusion of eating, consuming water and engaging in reproductive behavior?

ADDICTION POTENTIAL CAN ALSO BE PREDICTED IN PART BY OBSERVING ANIMAL SELF-ADMINISTRATION





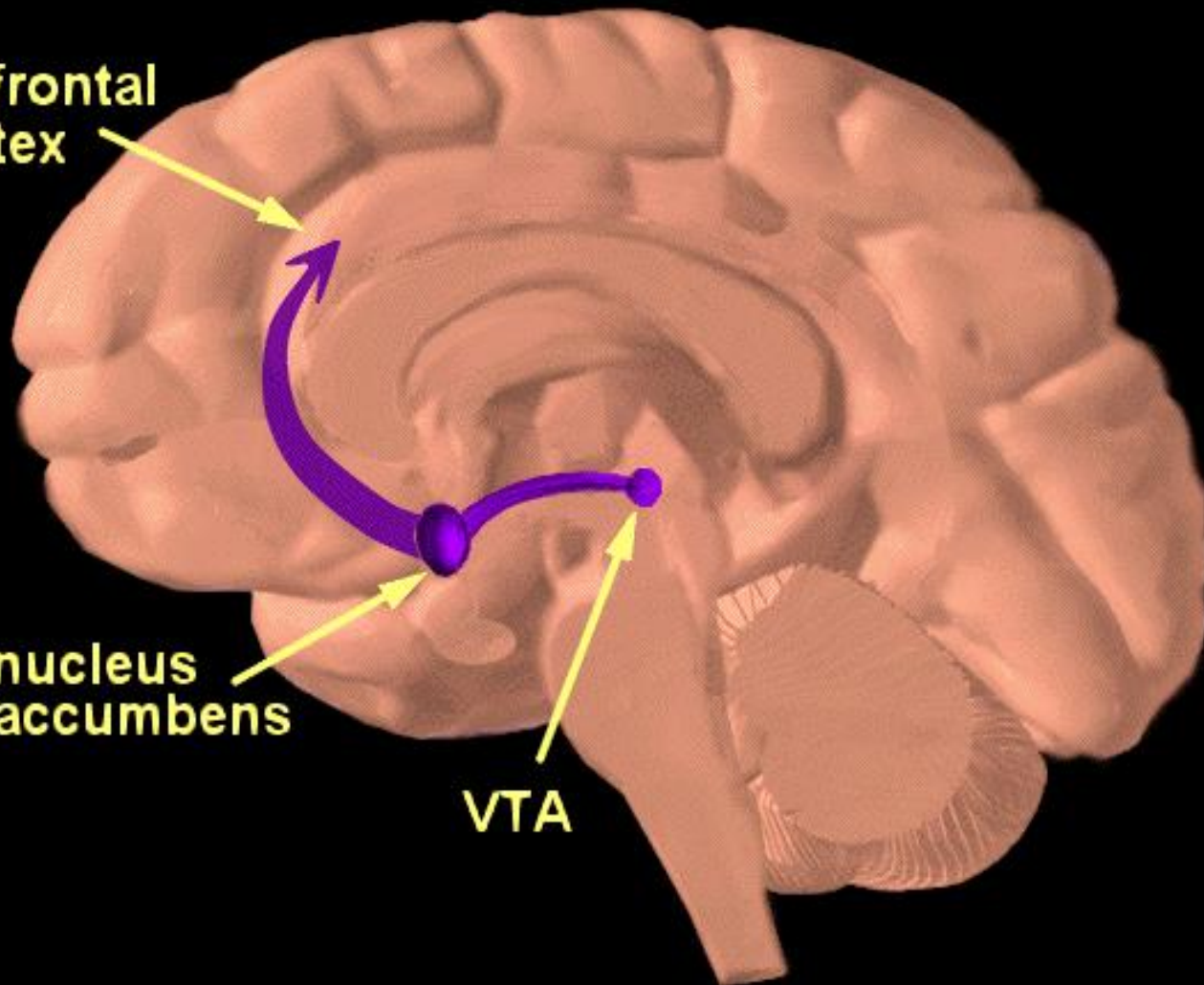




**prefrontal
cortex**

**nucleus
accumbens**

VTA



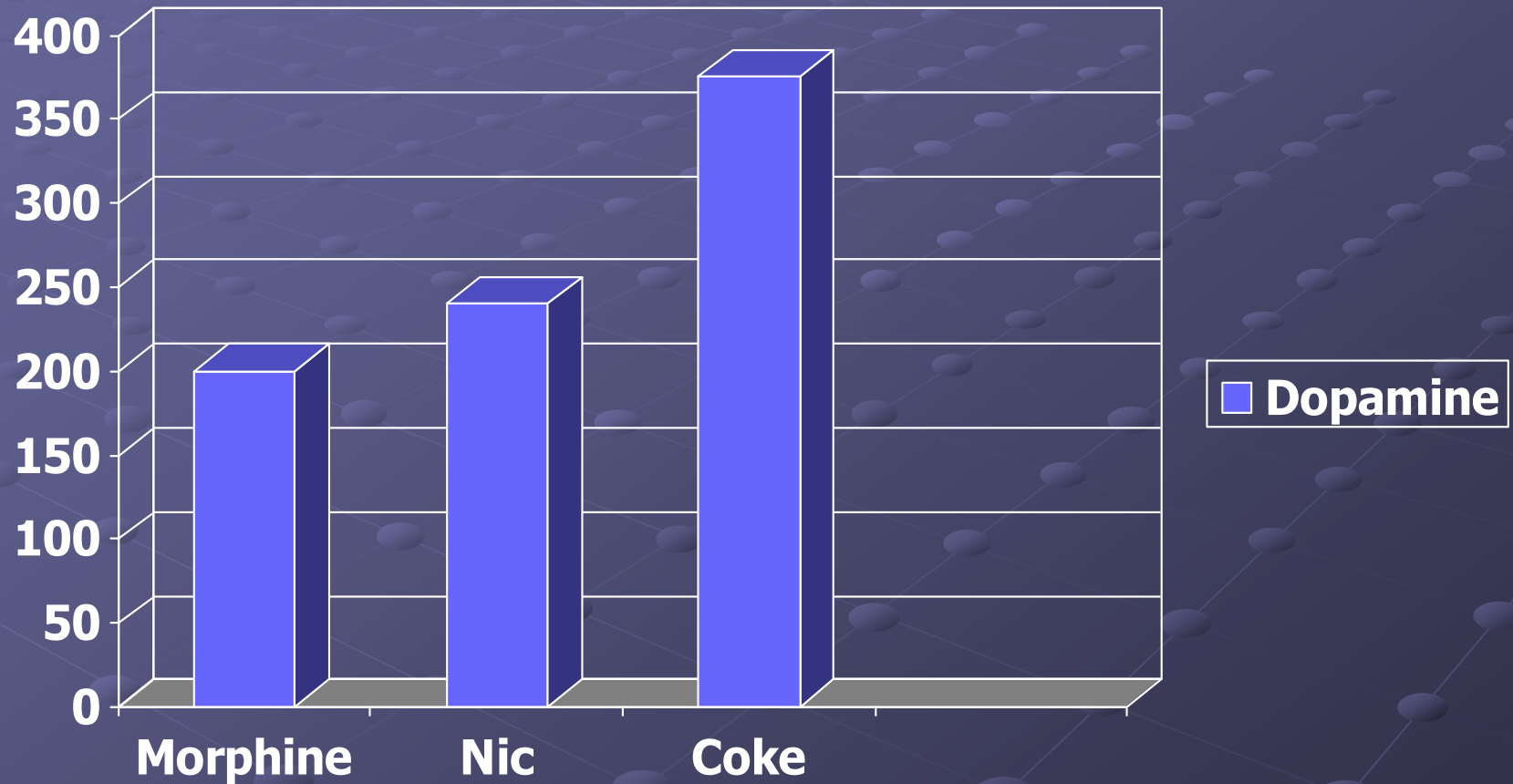
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- Ability to meet an individualized neurochemical need
- Physical dependency potential
- Intensity of withdrawal symptoms

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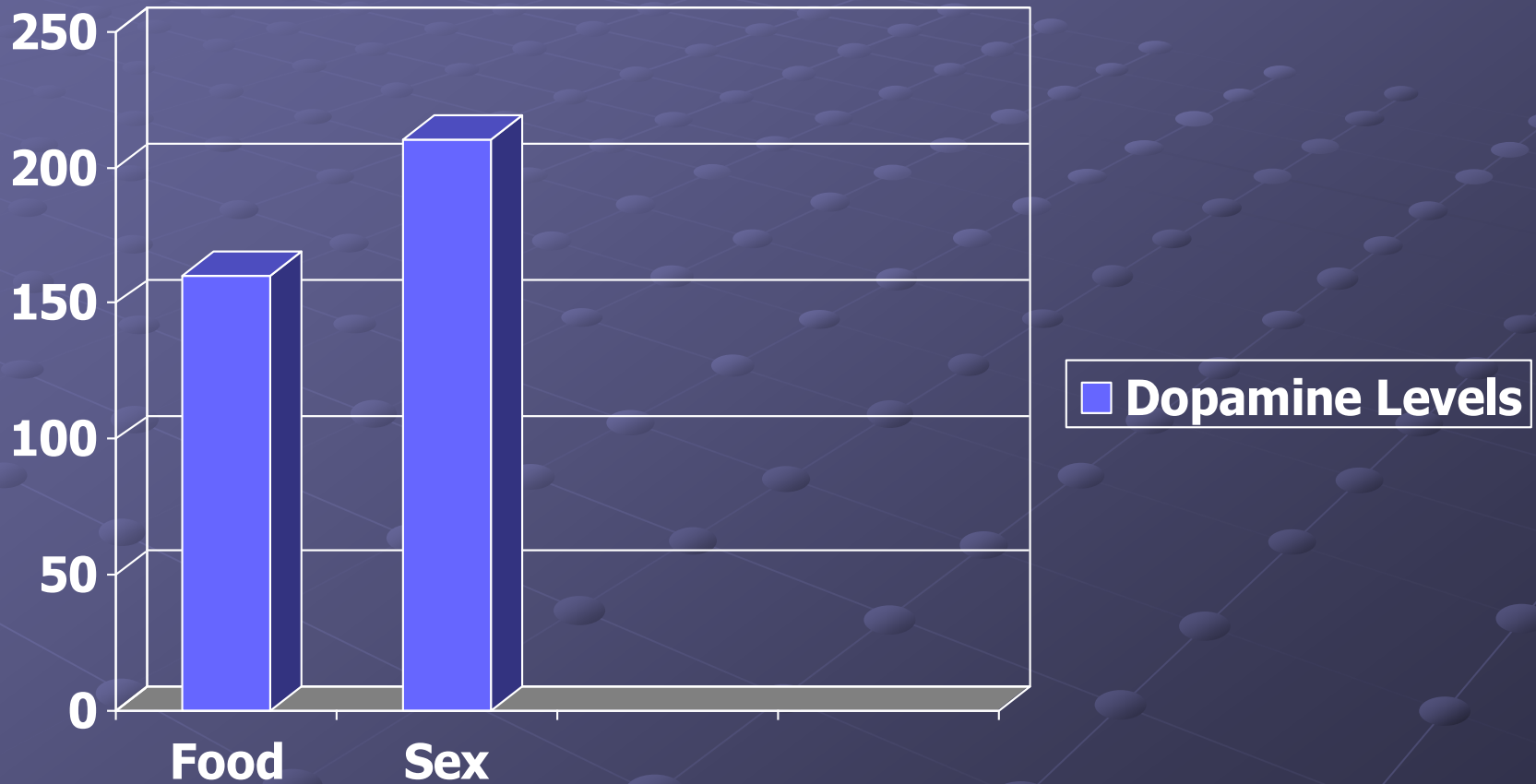
Dopamine Levels in the Shell of the Nucleus Accumbens (% of baseline)



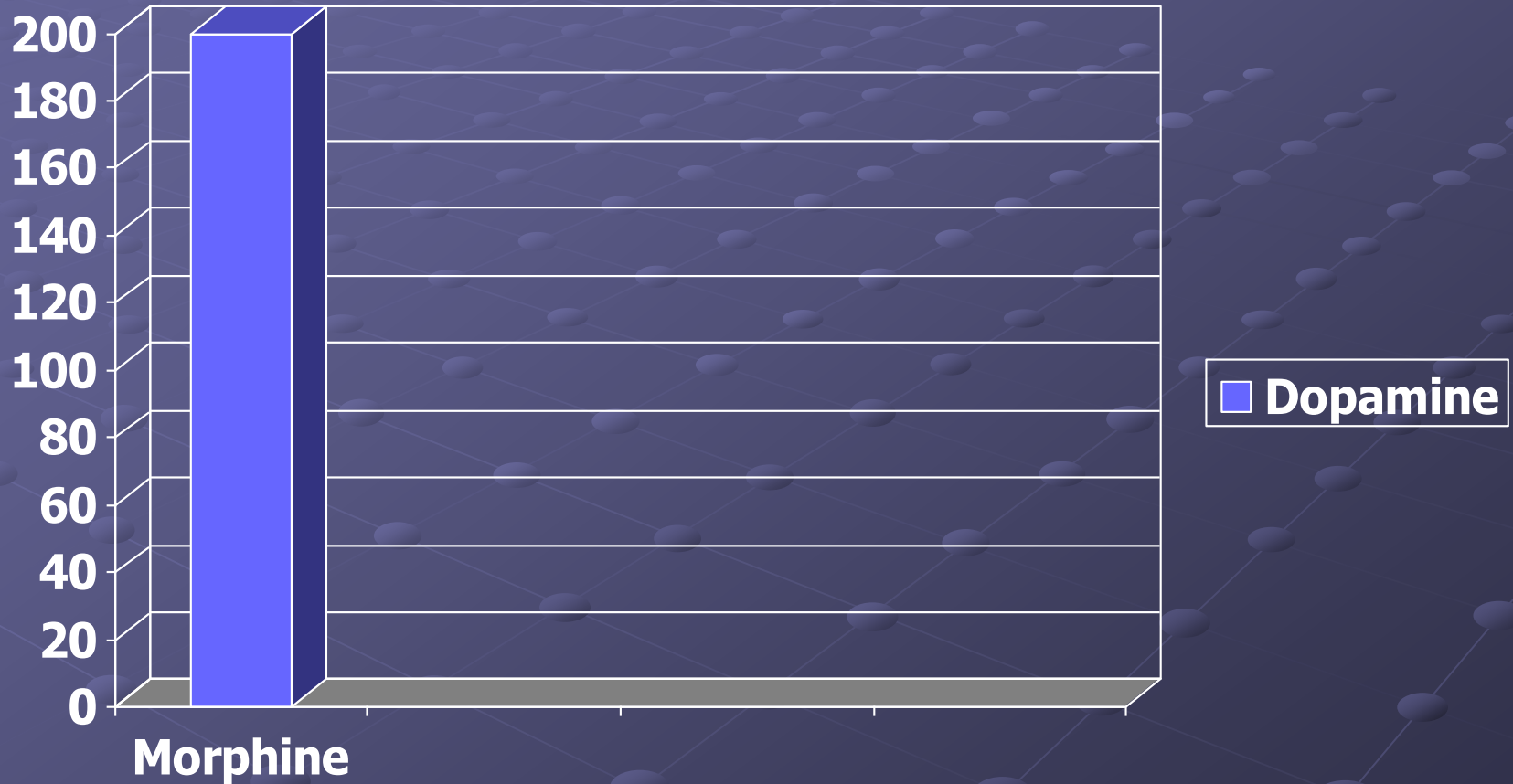
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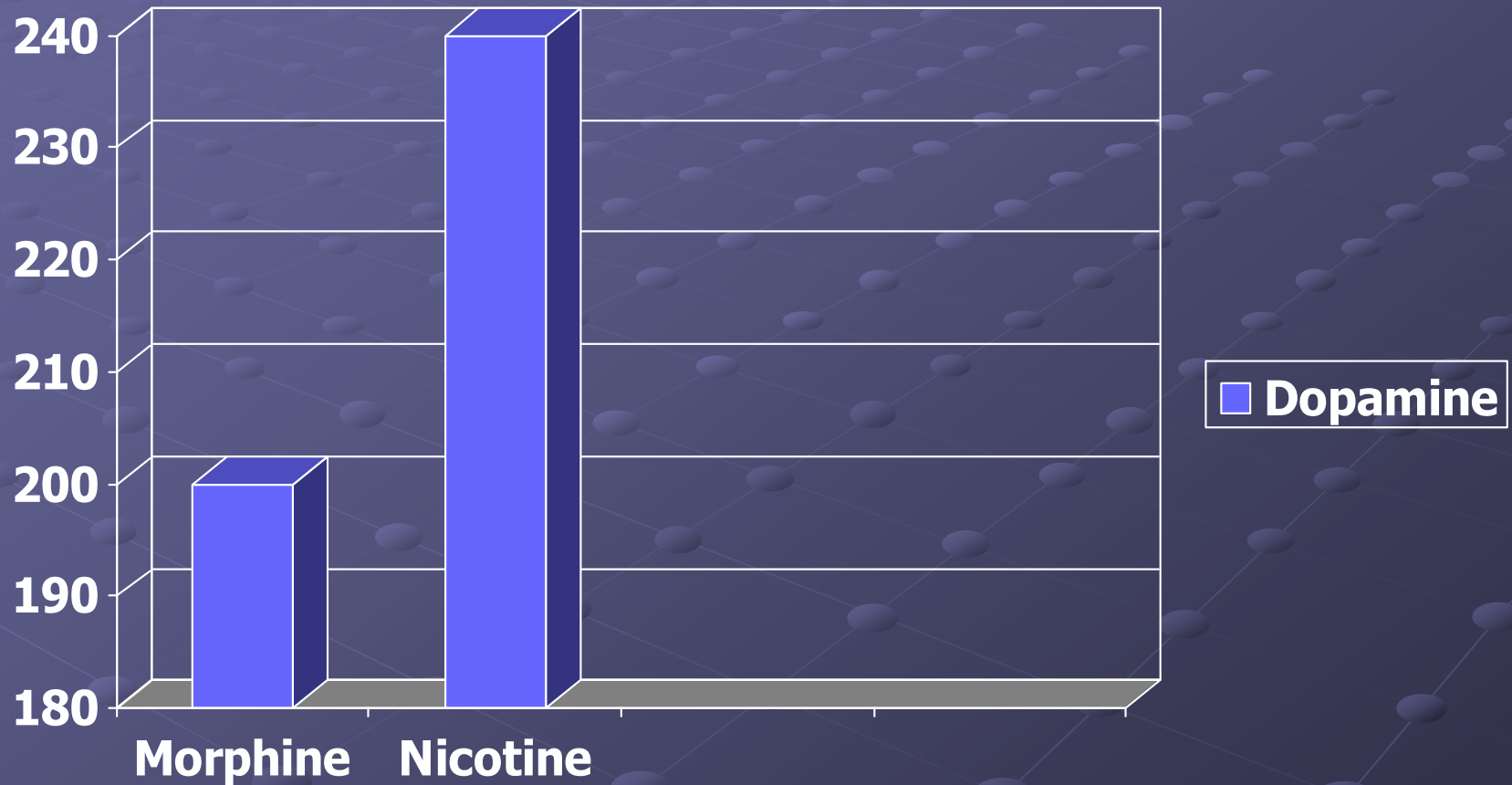
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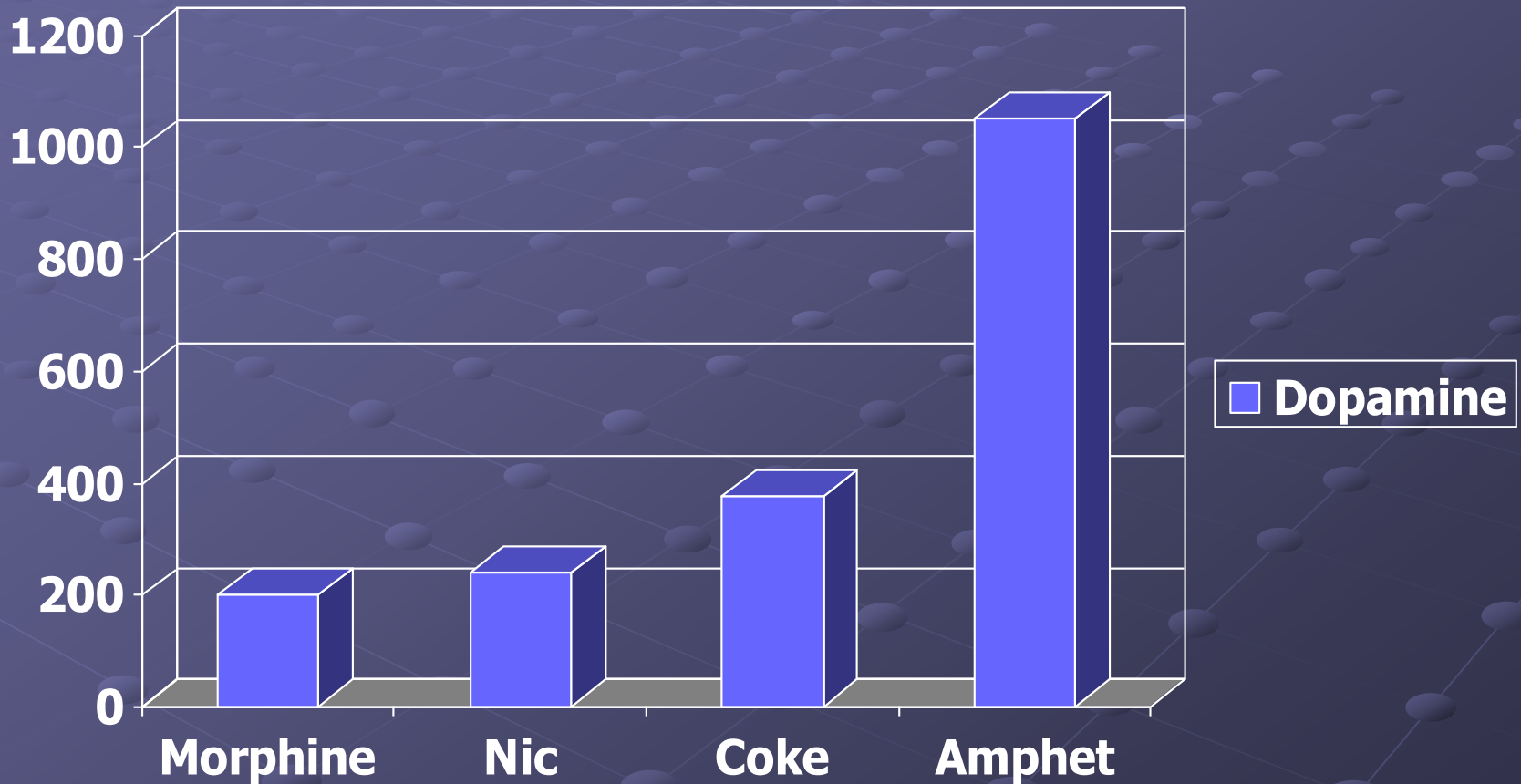
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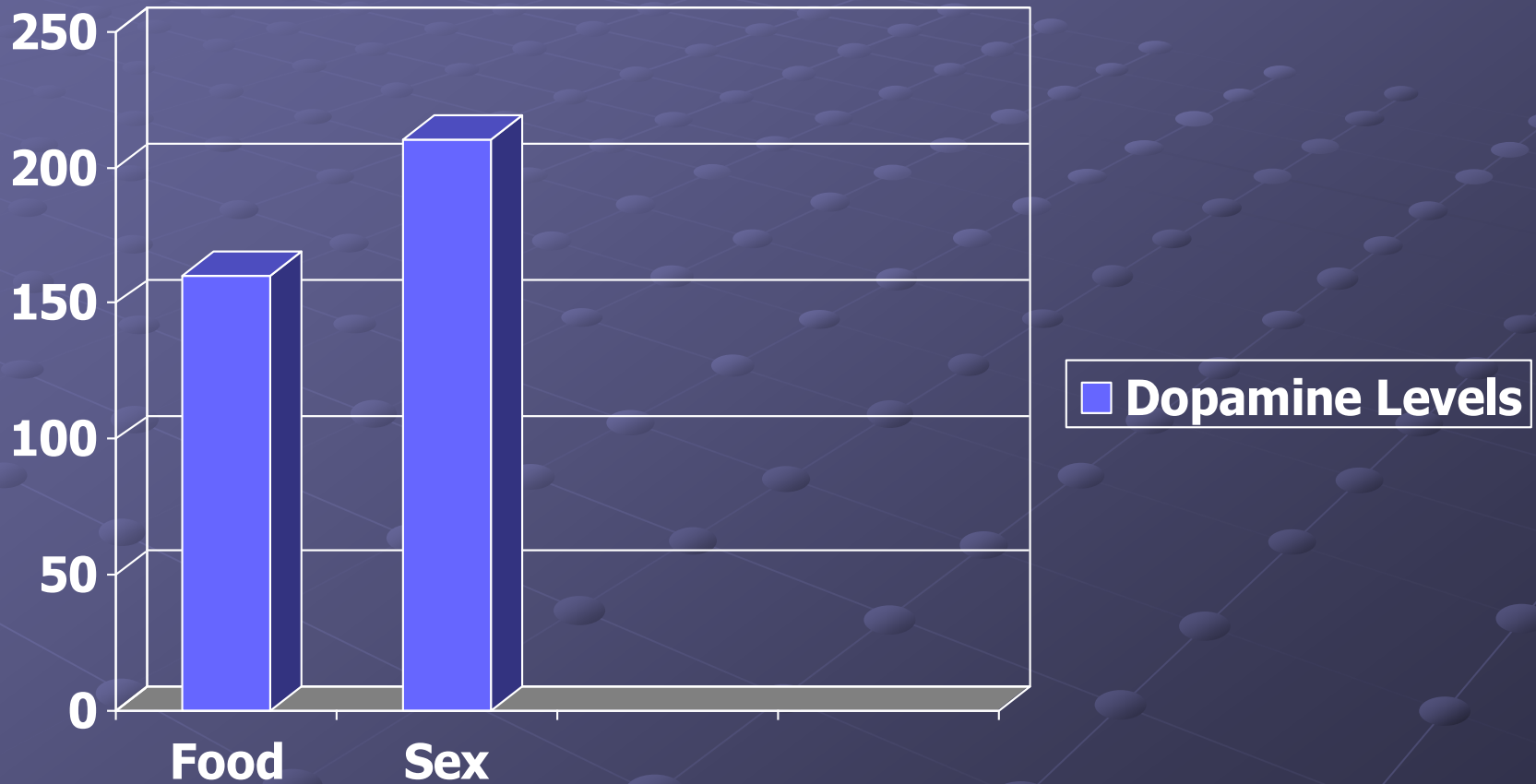
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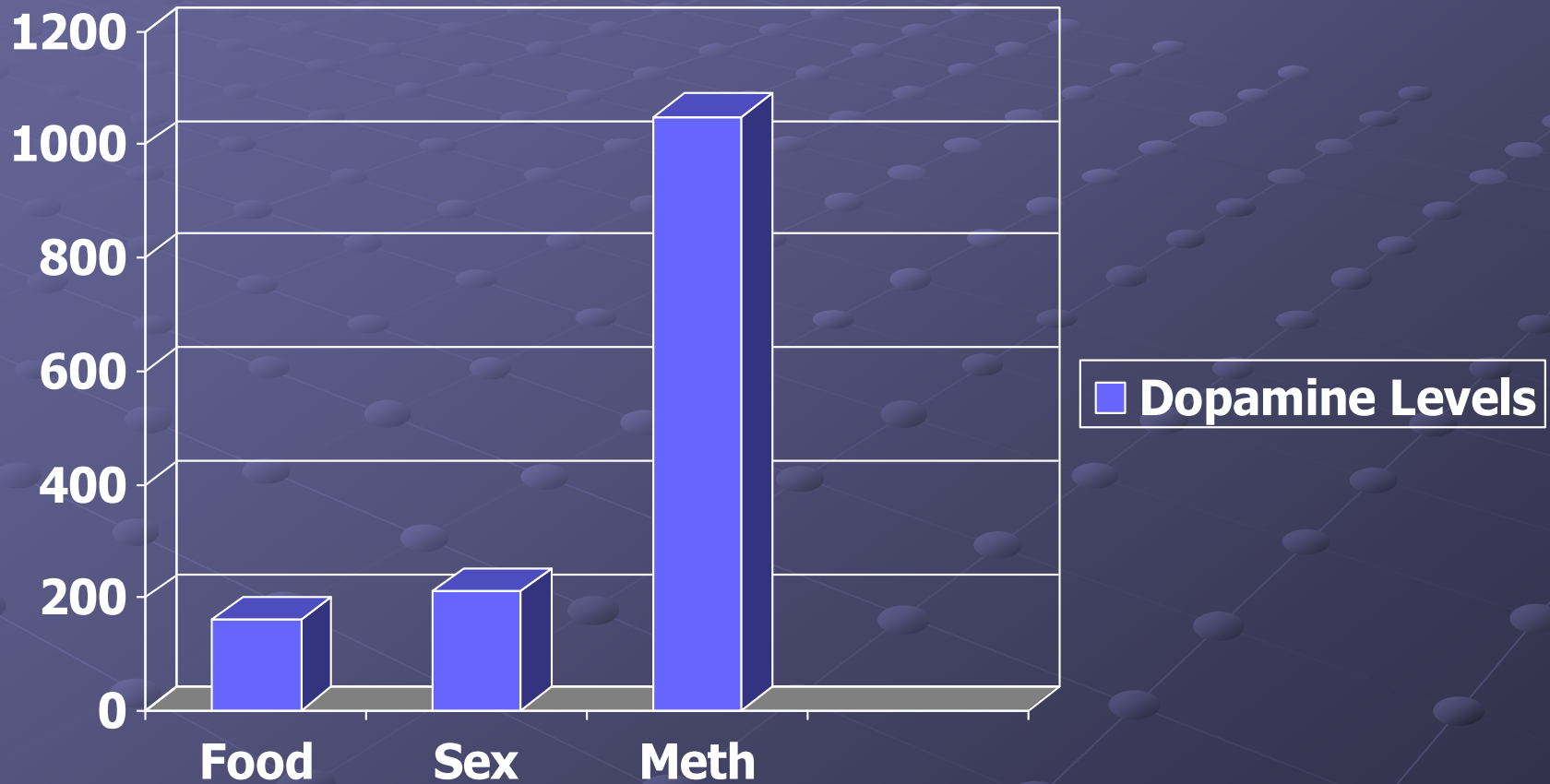
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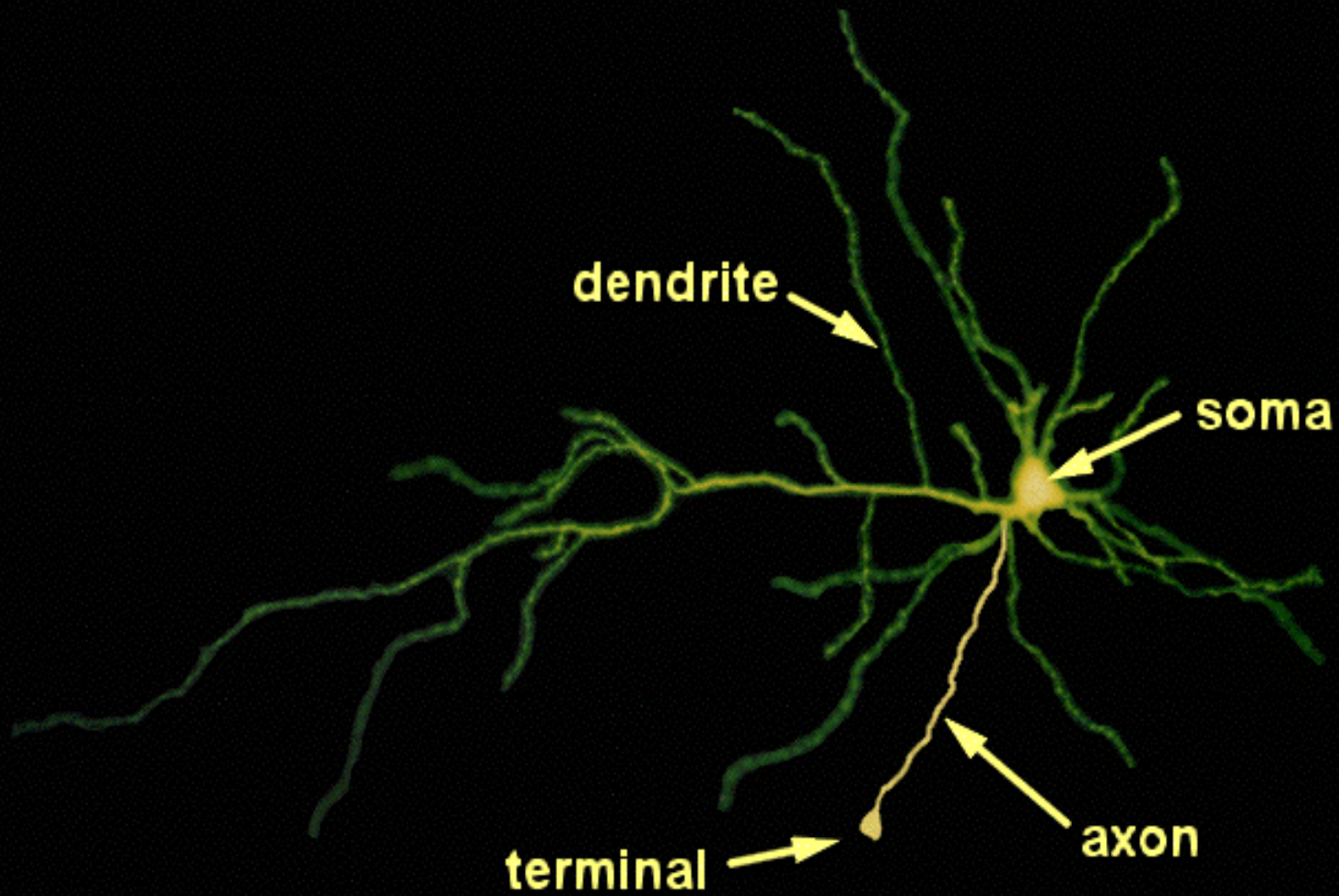


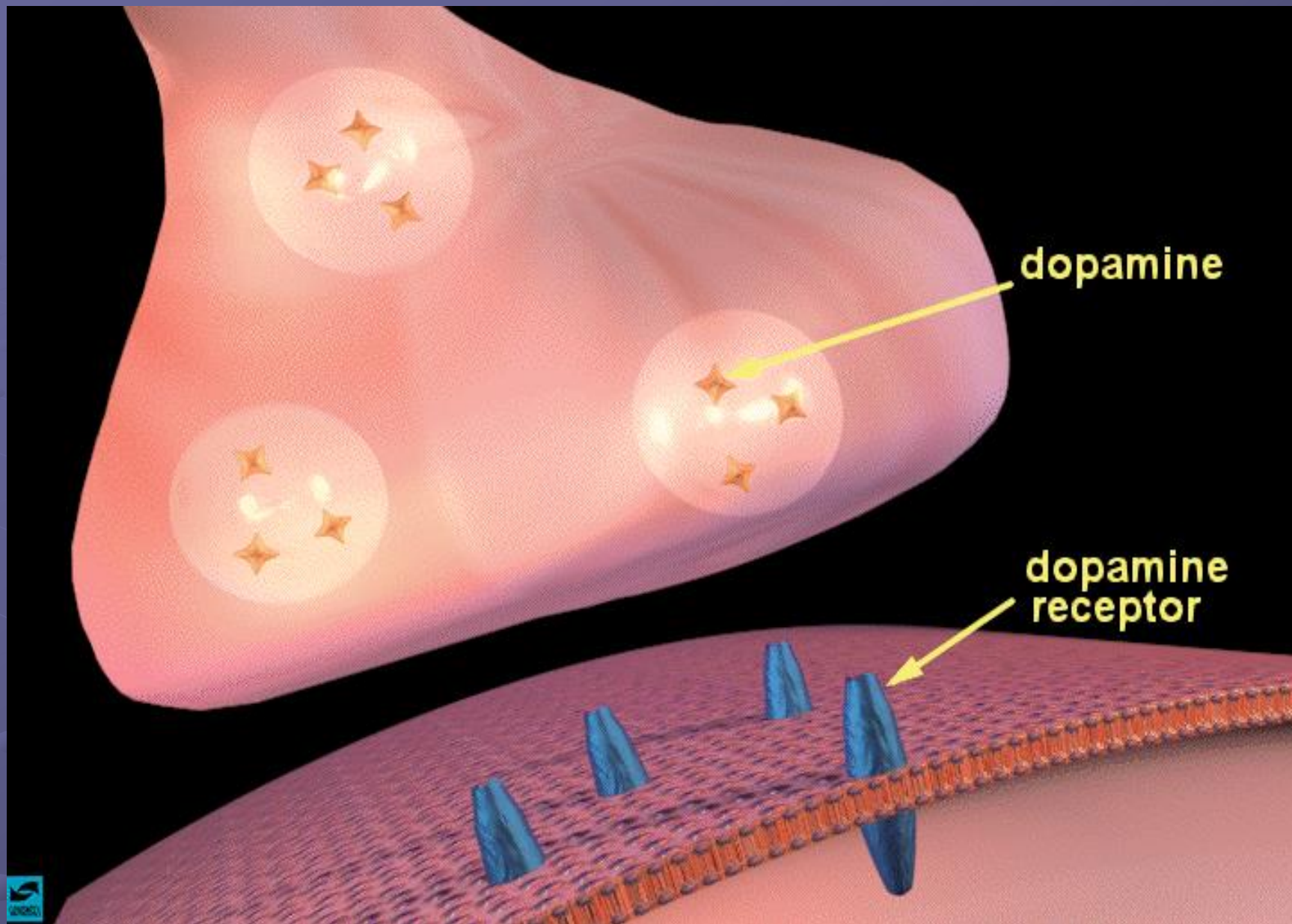
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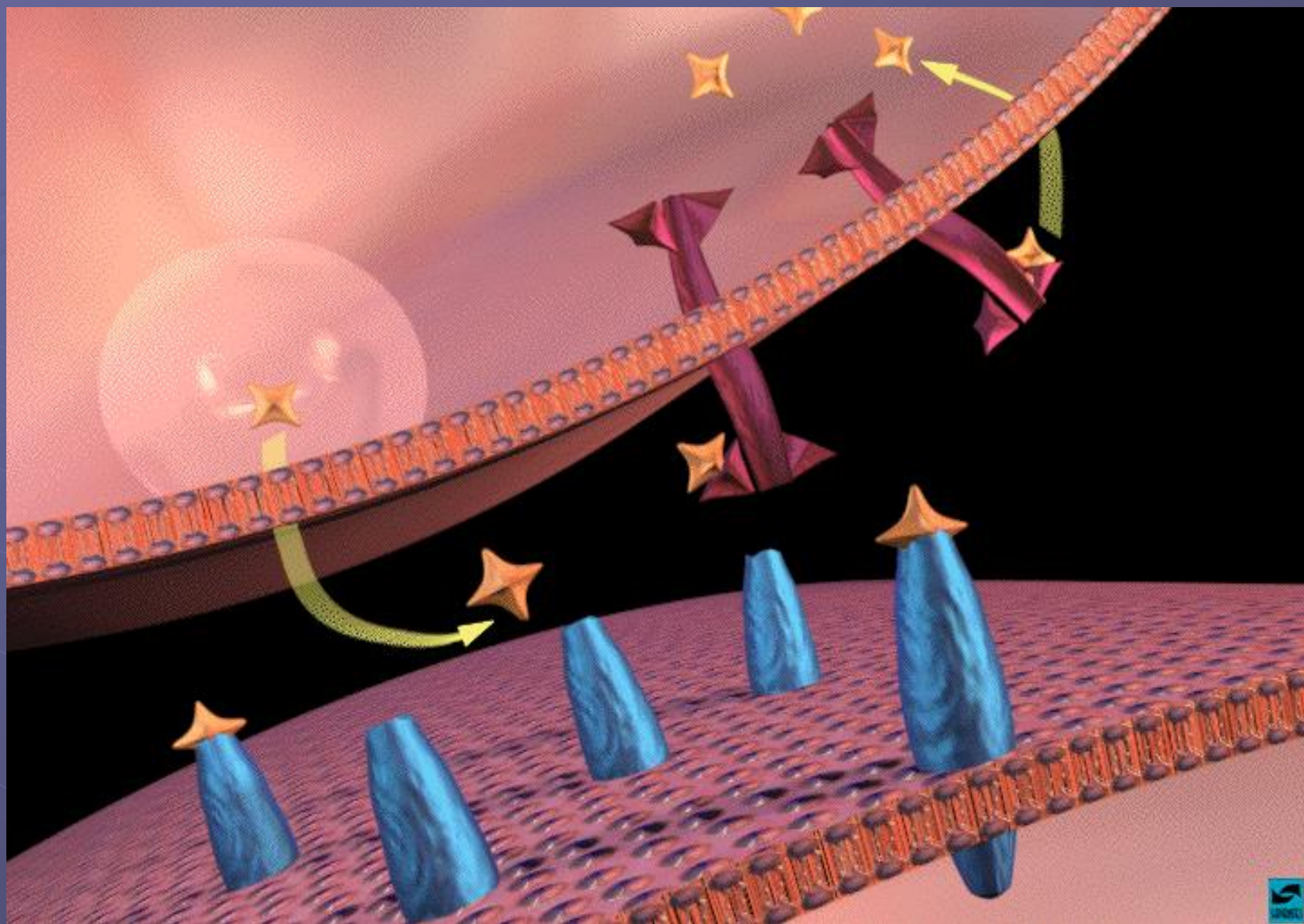


Dopamine Levels in the Shell of the Nucleus Accumbens (% of baseline)









NEUROTRANSMITTERS

- **Naturally-occurring brain chemicals**
- **Many psychoactive drugs resemble neurotransmitters:**

NEUROTRANSMITTERS

DRUG

NEUROTRANSMITTER

LSD

Serotonin

Methamphetamine

Norepinephrine

heroin

Endorphins

NEUROTRANSMITTERS

DRUG

NEUROTRANSMITTER

THC

Anandamide

PCP

Receptor site identified but not
associated neurotransmitter

ADDICTION*

- **Compulsive drug-taking**
- **Loss of control**
- **Continued use despite negative consequences**
- **Tolerance and physical dependence not required but may be part of the addiction picture**

* A rough summary of the DSM-V criteria

TOXICITY

- Ability to produce physical damage to the human body
- Long-range = months, years
- Short-range = days, weeks
- Physical vs behavioral

TOXICITY

- **Physical**
- **Behavioral**
- **Acute Vs Long-Term**

PSYCHIATRIC IMPAIRMENT

- Ability of drug to produce negative changes in thinking, learning, perception, mood or behavior
- Acute vs chronic

PSYCHIATRIC IMPAIRMENT

- **Short-term**
- **Long-term**
- **Affective Disorders**
- **Thought Disorders**