STUDY TOOL

Self-assessment quiz

Q1 · Ch.1 — How many fused rings make up the ergoline core of LSD?

A) Two

B) Three

C) Four

D) Five

Answer: C. The ergoline nucleus is tetracyclic: four fused rings (A–D). Rings A/B form the indole portion (with the N1 nitrogen), ring D carries the amine nitrogen N6 (DOI 10.1073/pnas.2603412123).

Q2 · Ch.1 — Which two positions are the 'historical' sites of structural modification in lysergamides?

A) N1 and N6

B) C2 and C5

C) N4 and N8

D) C8 only

Answer: A. N1 is the indolic nitrogen (acylation → prodrugs); N6 is the tertiary amine nitrogen of ring D (substitution → active-per-se analogues such as AL-LAD and ETH-LAD).

Q3 · Ch.1 — In the PNAS deconstruction study, what did the ergolog UCD0076 produce in mouse behavioural assays?

A) Hallucinogenic effects stronger than LSD

B) Antipsychotic-like effects without hallucinogenic activation

C) Increased cardiotoxicity

D) No CNS activity at all

Answer: B. UCD0076 prefers 5-HT2C over the other 5-HT2 receptors and produced antipsychotic-like effects in mice without the hallucinogenic profile (animal data; DOI 10.1073/pnas.2603412123).

Q4 · Ch.2 — Why are N1-acyl compounds inactive in vitro but active in vivo?

A) They bind a different receptor in vivo

B) Hydrolysis removes the acyl group and liberates LSD

C) In vitro assays are simply insensitive

D) They cross the blood–brain barrier only when intact

Answer: B. The N1 acyl group abolishes 5-HT2A affinity of the intact molecule; in vivo, chemical and hepatic hydrolysis regenerate LSD, the true active agent. They are prodrugs (DOI 10.1016/j.neuropharm.2019.107856).

Q5 · Ch.2 — What is detected in serum after oral 1P-LSD administration (PMID 32415750)?

A) Only intact 1P-LSD

B) 1P-LSD and LSD in equal amounts

C) Only LSD

D) Predominant hydroxylated metabolites

Answer: C. After oral dosing, only LSD is detected in serum and urine; oral bioavailability of LSD from 1P-LSD was close to 100% (human data, n = 2; DOI 10.1002/dta.2821).

Q6 · Ch.2 — What potency does 1B-LSD show in the murine HTR assay (PMID 31083768)?

A) 76% of LSD

B) 50% of LSD

C) 14% of LSD

D) 0% — fully inactive

Answer: C. 1B-LSD acts with ~14% of LSD potency (ED50 976.7 vs 132.8 nmol/kg, animal data). The difference reflects hydrolysis efficiency and pharmacokinetics, not intrinsic receptor action.

Q7 · Ch.2 — Which toxicity values are reported for 1V-LSD, and with what evidence status?

A) Clinical study: 92% hepatotoxicity

B) In-silico predictions: 92% pulmonary risk, hERG IC50 1.4 µM

C) Animal data: cardiotoxicity at 10 µg/kg

D) No estimates exist

Answer: B. Only computational predictions exist for 1V-LSD: pulmonary risk 92% and hERG IC50 1.4 µM (Percepta) — in-silico values, not experimentally verified (DOI 10.1007/s00204-025-04255-1).

Q8 · Ch.3 — What fundamentally distinguishes N6-substituted analogues from N1-acyl prodrugs?

A) They all convert to LSD

B) They do not convert to LSD: they are active per se

C) They are inactive in vivo

D) They act only on 5-HT2C

Answer: B. Tertiary amine (N6) substitution is not hydrolysable: AL-LAD and ETH-LAD never liberate LSD and possess their own intrinsic activity and metabolic profile.

Q9 · Ch.3 — What HTR potency is reported for AL-LAD relative to LSD?

A) ~14%

B) ~50%

C) ~76%

D) ~100%

Answer: C. AL-LAD ED50 174.9 nmol/kg vs LSD 132.8 nmol/kg → ≈76% of LSD potency in the murine HTR (animal data; DOI 10.1002/dta.1985).

Q10 · Ch.3 — What is the status of human evidence for ETH-LAD?

A) A controlled study in 83 volunteers

B) No human data

C) Extensive clinical case series

D) A study with n = 2

Answer: B. No controlled human data exist for ETH-LAD; information comes from preclinical models and non-controlled reports. All human-effect claims should be treated as uncertain.

Q11 · Ch.4 — In the pooled safety study of 83 healthy subjects, what was observed at the 200 µg LSD dose?

A) Renal and hepatic alterations

B) Peak heart rate >100 bpm in 25% and body temperature >38 °C in 34%

C) Seizures in 10%

D) No adverse effects

Answer: B. At 200 µg: peak HR >100 bpm in 25% and peak body temperature >38 °C in 34% (human data, controlled setting). No clinically relevant liver or kidney function changes were observed (DOI 10.1007/s00213-021-05978-6).

Q12 · Ch.4 — Which common adverse effects are reported for acute LSD administration?

A) Alopecia and rash

B) Headache, anxiety, nausea, dizziness

C) Hypotension and bradycardia

D) Permanent visual disturbances

Answer: B. Common adverse effects (human data) are headache, anxiety, nausea and dizziness — a largely acute sympathomimetic and psychic profile without organ toxicity at the doses studied.

Q13 · Ch.5 — Why can't an immunochromatographic test distinguish LSD from 1P-LSD or 1V-LSD?

A) Because it is too insensitive

B) Because it detects the indole structure shared by all lysergamides

C) Because it reacts only with LSD

D) Because the analogues contain no indole

Answer: B. Rapid tests (immunochromatographic strips; colorimetric reagents such as Ehrlich's) recognise the shared indole scaffold: they signal 'a lysergamide is present' without identifying which one.

Q14 · Ch.5 — Which method separates and identifies all lysergamide analogues simultaneously?

A) UV spectrophotometry

B) Marquis colorimetric test

C) LC-MS/MS

D) Single TLC plate

Answer: C. LC-MS/MS combines retention time, precursor ion and fragmentation transitions: it separates and identifies LSD and every analogue at once — the reference method in toxicology (e.g. DOI 10.1002/dta.2821).

Q15 · Ch.5 — What is NMR spectroscopy used for in lysergamide research?

A) Rapid blood quantification

B) Complete structural characterization (e.g. 1B-LSD)

C) Immunochromatographic testing

D) Estimating oral bioavailability

Answer: B. NMR assigns all proton and carbon resonances, confirms the substitution position (N1 vs N6), stereochemistry and purity: it is the method used to fully characterise new analogues such as 1B-LSD (DOI 10.1002/dta.2613).