

Study of pD₂ from a Guinea Pig Ileum Response Curve

Practical 12 | Pharmacology II

Aim

To study pD₂ from a Guinea Pig Ileum Response Curve, and interpret the recorded observations.

Principle

- pD₂ expresses agonist potency as the negative base-10 logarithm of EC₅₀ in molar units. It is not the maximum response or clinical dose.
- This exercise uses a software/video simulation or an instructor-provided dataset.
- A response depends on the model, intervention, controls and observation period; comparisons must use the same endpoint.

Materials and Apparatus

- Assigned software/video model, labelled traces and completed control/test data.
- Assigned pharmacology simulation/video and completed observation dataset.
- Computer, graphing or calculation software and a structured record sheet.

Method

1. Identify the simulated preparation, control group and response being measured.
2. Record the model settings and treatment labels supplied in the exercise.
3. Review the baseline or control trace before comparing the intervention traces.
4. Read the stated response endpoint using the same definition for every group.
5. Tabulate the completed simulation observations and calculate the assigned comparison.
6. Explain the mechanism, control response and any limitation of the model.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Molar concentration	_____
Response	_____
Maximum estimate	_____
EC50	_____
pD2	_____

Calculations and Interpretation

- $pD2 = -\log_{10}(EC50 \text{ in mol/L})$.
- State the agonist, preparation and response definition.

Worked Illustration

Illustration: $EC50 = 1.0 \times 10^{-6} \text{ mol/L}$ gives $pD2 = 6.0$.

The values in this illustration are for calculation practice.

Result

Report the supplied simulated response, its defined comparison and the mechanism supported by the model. Label the observations as simulated.

Finding: _____

Conclusion: _____

Precautions

- Keep software units, treatment labels and endpoint definitions consistent.
- Use supplied simulation data and distinguish an illustration from an observed outcome.
- A model demonstrates an experimental principle; it does not establish an individual patient treatment.

Viva Questions

1. Why must the model be identified?

The preparation, receptor system and endpoint determine which mechanism and calculation can explain the response.

2. Why use a control response?

It separates the intervention effect from baseline variation in the simulated model.

3. Why define the endpoint before comparison?

Changing the endpoint after reviewing results can bias the interpretation.

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