

Study of pA₂ of Prazosin by Schild Plot

Practical 11 | Pharmacology II

Aim

To study pA₂ of Prazosin by Schild Plot, and interpret the recorded observations.

Principle

- A competitive antagonist can shift agonist concentration-response curves to the right without reducing the achievable maximum. A Schild analysis examines dose ratios at different antagonist levels.
- 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
Antagonist molar concentration	_____
Control EC50	_____
Blocked EC50	_____
Dose ratio	_____
Schild coordinates	_____

Calculations and Interpretation

- $DR = EC_{50} \text{ with antagonist} / EC_{50} \text{ without antagonist}$.
- Plot $\log_{10}(DR - 1)$ against $\log_{10}(\text{antagonist molar concentration})$.
- For a compatible equilibrium competitive model with slope near one: $pA_2 = -\log_{10}(KB)$.

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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