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Semester 5 - Practical Notes

Pharmacology II

Complete Subject Manual

15 practicals and activities. Use the PDF bookmarks to move between practicals. Page numbers restart within each practical; the page counts below exclude the promotion pages.

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Study of In-Vitro Pharmacology and Physiological Salt Solutions

Practical 01 | Pharmacology II

Aim

To study In-Vitro Pharmacology and Physiological Salt Solutions, and interpret the recorded observations.

Principle

- Physiological salt solutions support the ionic, osmotic and buffering environment of an isolated-preparation model. Model-specific compositions must not be interchanged.
- 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
Solution identity	_____
Ion/buffer roles	_____
Model conditions	_____
Baseline trace	_____

Calculations and Interpretation

- Identify major ion roles and the reason for pH, temperature and oxygenation control in the teaching simulation.

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.

Study of Drug Effects on an Isolated Frog Heart

Practical 02 | Pharmacology II

Aim

To study Drug Effects on an Isolated Frog Heart, and interpret the recorded observations.

Principle

- Autonomic and other interventions can change simulated rate and contractile force. Rate and force are separate endpoints and may change in different directions.
- 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
Treatment	_____
Baseline rate	_____
Post-treatment rate	_____
Force amplitude	_____
Trace pattern	_____

Calculations and Interpretation

- Rate change (%) = (test rate - baseline rate)/baseline rate × 100.
- Report contractile-amplitude changes separately from rate.

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.

Study of Drug Effects on Blood Pressure and Heart Rate

Practical 03 | Pharmacology II

Aim

To study Drug Effects on Blood Pressure and Heart Rate, and interpret the recorded observations.

Principle

- The simulated dog cardiovascular trace relates arterial pressure and rate to drug mechanisms and reflex responses. Direct receptor actions and reflex changes must be distinguished.
- 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
Intervention	_____
Baseline pressure	_____
Peak pressure	_____
Baseline/test heart rate	_____
Time course	_____

Calculations and Interpretation

- Pressure change = test pressure - baseline pressure.
- For a percentage change, divide by baseline pressure and multiply by 100.

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.

Study of Diuretic Activity in a Rodent Model

Practical 04 | Pharmacology II

Aim

To study Diuretic Activity in a Rodent Model, and interpret the recorded observations.

Principle

- Diuretic comparisons use urine output over the same collection interval and, where supplied, electrolyte excretion. Concentration alone does not measure total electrolyte loss.
- 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
Group	_____
Collection interval	_____
Urine volume	_____
Electrolyte concentration	_____
Electrolyte amount	_____

Calculations and Interpretation

- Electrolyte amount = urine electrolyte concentration × urine volume, with consistent units.
- Compare test and control output over equal intervals.

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.

Study of Acetylcholine Dose-Response Curve on Frog Rectus

Practical 05 | Pharmacology II

Aim

To study Acetylcholine Dose-Response Curve on Frog Rectus, and interpret the recorded observations.

Principle

- Increasing acetylcholine levels can produce a graded contractile response in the supplied skeletal-muscle model. Plotting response against log concentration supports comparison of sensitivity.
- 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
Acetylcholine concentration	_____
Log concentration	_____
Response amplitude	_____
Percent maximum	_____

Calculations and Interpretation

- Percent maximum = response amplitude/maximum response × 100.
- Read EC50 only when the data bracket 50% of the estimated maximum.

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.

Study of Physostigmine and Atropine Effects on Acetylcholine Responses

Practical 06 | Pharmacology II

Aim

To study Physostigmine and Atropine Effects on Acetylcholine Responses, and interpret the recorded observations.

Principle

- Physostigmine reduces acetylcholine breakdown; atropine blocks muscarinic receptors. The effect depends on whether the simulated preparation predominantly represents muscarinic or nicotinic responses.
- 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
Preparation	_____
Intervention	_____
Control curve	_____
Altered curve	_____
Maximum and EC50	_____

Calculations and Interpretation

- Compare EC50 and maximum response before and after intervention.
- Do not assume atropine competitively blocks the nicotinic receptor response of frog rectus.

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.

Study of Histamine Bioassay by Matching on Guinea Pig Ileum

Practical 07 | Pharmacology II

Aim

To study Histamine Bioassay by Matching on Guinea Pig Ileum, and interpret the recorded observations.

Principle

- A matching assay compares the unknown preparation with reference concentrations producing equivalent responses under the same simulated conditions.
- 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
Reference level	_____
Reference response	_____
Test dilution	_____
Matched response	_____
Potency estimate	_____

Calculations and Interpretation

- At a matched response, estimate test concentration using the matched reference concentration and documented test dilution.
- Matching is conditional on comparable response behaviour and valid controls.

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.

Study of Oxytocin Bioassay by Interpolation on Rat Uterine Horn

Practical 08 | Pharmacology II

Aim

To study Oxytocin Bioassay by Interpolation on Rat Uterine Horn, and interpret the recorded observations.

Principle

- Interpolation locates an unknown response between bracketing reference responses within an appropriate locally calibrated range. Tissue sensitivity is a model variable.
- 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
Reference concentration	_____
Reference response	_____
Unknown response	_____
Dilution	_____
Interpolated concentration	_____

Calculations and Interpretation

- Use the fitted reference calibration and the stated concentration or log-concentration axis.
- Avoid extrapolating beyond the bracketing reference responses.

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.

Study of Serotonin Bioassay by the Three-Point Method

Practical 09 | Pharmacology II

Aim

To study Serotonin Bioassay by the Three-Point Method, and interpret the recorded observations.

Principle

- A three-point bioassay uses two reference levels and one test level in a stated design. Relative potency is estimated within the common response range and the model assumptions.
- 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
Reference levels	_____
Test level	_____
Response replicates	_____
Model slope	_____
Relative potency	_____

Calculations and Interpretation

- Use the course-specified assay model and dilution correction.
- For a valid common log-dose slope, an appropriately defined horizontal log-dose shift gives a potency ratio of 10 raised to that shift.

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.

Study of Acetylcholine Bioassay by the Four-Point Method

Practical 10 | Pharmacology II

Aim

To study Acetylcholine Bioassay by the Four-Point Method, and interpret the recorded observations.

Principle

- Two reference and two test levels allow a parallel-line assay assessment in the suitable response range. Nonparallel responses invalidate a simple relative-potency interpretation.
- 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
Reference/test levels	_____
Replicate responses	_____
Slopes	_____
Parallelism assessment	_____
Potency	_____

Calculations and Interpretation

- Estimate the relative potency by the assigned parallel-line calculation or validated software.
- Keep the reference/test dilution factors and the direction of the log-dose shift explicit.

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.

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.

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.

Study of Spasmogens and Spasmolytics on Rabbit Jejunum

Practical 13 | Pharmacology II

Aim

To study Spasmogens and Spasmolytics on Rabbit Jejunum, and interpret the recorded observations.

Principle

- Spasmogens can increase simulated smooth-muscle activity; spasmolytics can reduce selected induced responses. Baseline rhythmic activity and induced contraction must be distinguished.
- 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
Treatment	_____
Baseline activity	_____
Induced contraction	_____
Post-intervention amplitude	_____
Recovery	_____

Calculations and Interpretation

- For a defined induced response: inhibition (%) = $(\text{control induced response} - \text{test induced response}) / \text{control induced response} \times 100$.

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.

Study of Anti-Inflammatory Activity in a Paw-Edema Model

Practical 14 | Pharmacology II

Aim

To study Anti-Inflammatory Activity in a Paw-Edema Model, and interpret the recorded observations.

Principle

- Inflammatory swelling is compared using the increase from baseline at the same stated time. Comparing final volumes alone can confound an initial size difference.
- 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
Group	_____
Baseline volume	_____
Post-challenge volume	_____
Increase	_____
Inhibition	_____

Calculations and Interpretation

- Increase = post-challenge volume - baseline volume.
- Inhibition (%) = (control increase - test increase)/control increase × 100.

Worked Illustration

Illustration: control increase 0.60 mL and test increase 0.30 mL give 50.0% inhibition.

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.

Study of Central and Peripheral Analgesic Activity

Practical 15 | Pharmacology II

Aim

To study Central and Peripheral Analgesic Activity, and interpret the recorded observations.

Principle

- Central teaching models may compare response latency, while peripheral models may compare a defined response count. The endpoint and interpretation depend on the simulated method.
- 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
Model	_____
Control endpoint	_____
Test endpoint	_____
Observation interval	_____
Effect estimate	_____

Calculations and Interpretation

- For a count-reduction endpoint: inhibition (%) = (control count - test count)/control count × 100.
- For latency, report the defined latency change and the model's cut-off rather than using the count formula.

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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