In-vitro Absorption and Permeability

Experiment 10 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To analyse the assigned in-vitro absorption and permeability experiment or teaching dataset.

Principle

An in-vitro transport model measures appearance across a defined barrier. Apparent permeability depends on area, donor concentration and the model assumptions.

Requirements

- Institution-assigned experimental method and coded in-vitro or supplied pharmacokinetic data.
- Calibrated analytical readings or supplied concentration table, calculator and plotting tools.

Procedure

1. Read model data

Record donor/receiver system, barrier area and initial donor concentration supplied.

2. Calculate transport

Obtain receiver-side cumulative amount with sampling correction and identify the applicable linear time region.

3. Calculate Papp

Use dQ/dt, area and donor concentration with consistent units.

4. Assess

Check mass recovery, concentration assumptions and barrier suitability before generalising to in-vivo absorption.

Observations and Record

Record component	Value
Model / area	_____
Donor concentration	_____
Time / receiver amount	_____
Slope / Papp	_____
Recovery and limitation	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Papp = (dQ/dt)/(A × C0). If dQ/dt is micrograms/s, A cm^2 and C0 micrograms/cm^3, Papp is cm/s.
- Example: 0.01 microgram/s divided by (1 cm^2 × 100 micrograms/cm^3) gives 0.0001 cm/s.

Result

Dataset / method: ____. Calculated outcome and units: ____. Comparison: ____. Assumption or limitation: ____.

Precautions

- Record units, sampling times, dilution and the assumptions of the selected model.
- Use supplied human/animal data or the approved in-vitro teaching method; no new human/animal dosing or surgical preparation is prescribed.
- Keep an illustrative calculation separate from the actual result and do not use it as an individual patient dosing instruction.

Viva Questions and Answers

1. Why state model assumptions?

The derived parameter is valid only when the data and model satisfy them.

2. What accompanies a pharmacokinetic result?

Its units, dataset, calculation method and relevant limitation.

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