

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	_____

Biopharmaceutics and Pharmacokinetics

Worked Example

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

- $P_{app} = (dQ/dt)/(A \times C_0)$. If dQ/dt is micrograms/s, A cm^2 and C_0 micrograms/ cm^3 , P_{app} is cm/s .
- Example: 0.01 microgram/s divided by ($1 \text{ cm}^2 \times 100 \text{ micrograms/cm}^3$) 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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