

DRUG RESPONSE RELATIONSHIP

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Problem 1

EC50 mainly reflects a drug's:

- A) maximal effect
- B) potency
- C) lethality
- D) ease of elimination
- E) safety

Problem 2

Pharmacogenetic effects:

- A) prolonged mivacurium-induced neuromuscular blockade due to atypical cholinesterase
- B) succinylcholine or volatile anesthetic-induced malignant hyperthermia
- C) both
- D) neither

Problem 3

The main purpose of Phase II studies is to determine:

- 1. Pharmacokinetic parameters in human subjects.
- 2. Efficacy in subjects with the disease for which the drug is intended.
- 3. Safety in pregnant women.
- 4. Incidence of side effects in normal healthy volunteers.
- 5. Incidence of side effects in a sample size of 5,000 patients.

Problem 4

Which of the following statements regarding drug tolerance is INCORRECT?

- 1. Tolerance is a condition of decreased responsiveness acquired following exposure to a drug.
- 1. A decrease in the rate of elimination following prior drug exposure can contribute to tolerance.
- 3. An animal that becomes tolerant to the effects of a particular drug may also be tolerant to the effects of other drugs to which it has not been exposed.
- 4. A drug-induced decrease in the number of functional receptors may underlie tolerance.
- 5. Tolerance may not develop uniformly to all the pharmacological effects of a drug.

Problem 5

The beat rate of an isolated heart preparation *in vitro* was determined in response to various drugs. Norepinephrine applied alone caused the expected effect with an EC50 of 10⁻⁶ M; Drug A alone had no effect. When norepinephrine was applied in the presence of Drug A, there was no change in the maximum effect of norepinephrine, but its EC50 was 10⁻⁷ M. These data are most consistent with an effect of Drug A as:

- 1. A noncompetitive antagonist of norepinephrine.
- 2. A competitive antagonist of norepinephrine.
- 3. A potentiator of norepinephrine. *
- 4. An agonist like norepinephrine.
- 5. A partial agonist.

Problem 6

Quantal dose-effect curves were determined for the analgesic and lethal effects of Drugs B and C in experimental animals following subcutaneous dosing. Selected doses, in mg/kg of body weight, are tabulated below.

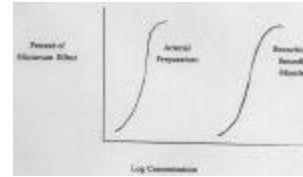
	ED1	LD99	ED50	ED99	LD1	LD50	
Drug B	0.1	1		10	20	40	80
Drug C	5	10		20	20	40	80

We may conclude from the data that:

1. Drug B is more potent than Drug C with respect to both analgesic efficacy and lethality.
2. Drug C has a greater maximum analgesic effect than Drug B.
3. Drug B is safer than Drug C based on the standardized safety margin.
4. Drug C is ten times more potent as an analgesic than Drug B in the average test animal.
5. Drug C is safer than Drug B, based on the therapeutic indices.

Problem 7

The effect of Drug Q was studied on two *in vitro* preparations, an isolated arterial vessel and a strip of bronchial smooth muscle. Drug Q was found to produce a dose-dependent relaxation of the artery and contraction of the bronchial strip. Pretreatment with atropine shifted the curve of Drug Q induced arterial relaxation to the right but had no effect on the curve for the bronchial strip. This observation and the data shown above (presented as a percent of the maximum effect) permit the conclusion that Drug Q:



Problem 7-Cont'd

1. Acts on the same receptors in the arterial and bronchial preparations and has greater affinity for the arterial receptors.
2. Has a greater EC50 for arterial than for bronchial smooth muscle.
3. Acts on different receptors in the two preparations and has higher affinity for those in the bronchial smooth muscle.
4. Is selective for the arterial as compared to the bronchial preparation.
5. Has the same intrinsic activity with respect to the arterial and bronchial preparations.

Problem 8

Dose-response curves are used for drug evaluation in the animal laboratory and in the clinic. *Quantal* dose response curves are often:

1. Used for determining the therapeutic index of a drug
2. Used for determining the maximal efficacy of a drug
3. Invalid in the presence of inhibitors of the drug being studied
4. Obtainable from the study of intact subjects but not from isolated tissue preparations
5. Used to determine the statistical variation (standard deviation) of the maximal response to the drug

Problem 9

