PHARMACODYNAMICS II (LEC3)

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MCQS

1. Which type of dose-response relationship exhibits a continuous and gradual response?

a. Quantal dose-response

b. Graded dose-response (Correct)

c. Non-competitive dose-response

d. Allosteric dose-response

e. Irreversible dose-response

2. What is potency in pharmacology determined by?

a. The number of drug-receptor complexes formed

b. Receptor concentration in the tissue (Correct)

c. Efficacy of the stimulus-response coupling mechanism

d. The efficiency of agonist binding

e. Affinity of the drug for the receptor

3. Which type of drug is more potent, one that requires a lesser amount to produce a 50-percent effect, or one that requires more?

a. The one that requires more

b. Both are equally potent

c. The one that requires less (Correct)

d. Potency is unrelated to the amount of the drug

e. It depends on the receptor type

4. What is efficacy in pharmacology related to?

a. The affinity of a ligand for its receptor

b. The strength of the interaction between a ligand and its receptor

c. The ability of a drug to elicit a response when it interacts with a receptor (Correct)

d. The maximal response achieved by a drug

e. The number of receptors available in the tissue

5. What is an example of an irreversible antagonist?

a. Atropine

b. Beta-blockers

c. Protamine

d. Alkaline antacids

e. Irreversible antagonists form strong irreversible covalent bonds with receptors (Correct)

6. Which type of antagonist binds to a different receptor from the agonist and lacks specificity?

a. Competitive reversible antagonist

b. Non-competitive antagonist

c. Uncompetitive antagonist (Correct)

d. Physiological antagonist

e. Chemical antagonist

7. What is tachyphylaxis associated with?(Deleted)

a. Depletion of intracellular stores of transmitter

b. Repeated use of large doses of direct receptor agonists (Correct)

c. Receptor down-regulation

d. Desensitization of receptors

e. Irreversible antagonist use

8. What is the main cause of response variation in individuals to drugs?

a. Abnormality in receptor number or function

b. Variation in the concentration of an endogenous receptor ligand

c. Post-receptor defects inside cells

d. Variation in the concentration of drugs that reach tissue receptors (Correct)

e. Genetic variations

9. What does up-regulation of receptors refer to?

a. Increase in the number of receptors (Correct)

b. Decrease in receptor affinity

c. Receptor saturation

d. Desensitization of receptors

e. Depletion of intracellular stores

10. Which type of dose-response curve has the general shape described as a rectangular hyperbola?

a. Quantal dose-response

b. Irreversible dose-response

c. Graded dose-response (Correct)

d. Allosteric dose-response

e. Competitive reversible dose-response

Answers with explaining:

Certainly, here are the answers to the MCQs along with explanations:

1. Which type of dose-response relationship exhibits a continuous and gradual response?

****Correct Answer: b. Graded dose-response****

Explanation: Graded dose-response relationships represent continuous and gradual effects, where the response varies with the increasing dose of a drug.

2. What is potency in pharmacology determined by?

****Correct Answer: e. Affinity of the drug for the receptor**

Explanation: the concentration of receptors can be similar if I compare the potency between tow drugs.but if we notice that there us a difference in potency,this would refer to variance in affinity.

3. Which type of drug is more potent, one that requires a lesser amount to produce a 50-percent effect, or one that requires more?

****Correct Answer: c. The one that requires less****

Explanation: In pharmacology, a more potent drug is one that requires a smaller amount to produce a specific effect, such as a 50-percent effect (EC50).

4. What is efficacy in pharmacology related to?

****Correct Answer: c. The ability of a drug to elicit a response when it interacts with a receptor****

Explanation: Efficacy refers to a drug's capacity to elicit a response when it interacts with a receptor, regardless of its potency.

5. What is an example of an irreversible antagonist?

Correct Answer: e. Irreversible antagonists form strong irreversible covalent bonds with receptors

Explanation: Irreversible antagonists form strong and typically irreversible covalent bonds with receptors, making them difficult to displace by increasing the agonist's concentration.

6. Which type of antagonist binds to a different receptor from the agonist and lacks specificity?

Correct Answer: c. Uncompetitive antagonist

Explanation: An uncompetitive antagonist binds to a receptor different from that of the agonist and lacks specificity as it affects other agonists as well.

7. What is tachyphylaxis associated with?

Correct Answer: b. Repeated use of large doses of direct receptor agonists

Explanation: Tachyphylaxis is associated with the repeated use of large doses of direct receptor agonists, usually at short dose intervals, and is characterized by rapidly developing receptor tolerance.

8. What is the main cause of response variation in individuals to drugs?

Correct Answer: d. Variation in the concentration of drugs that reach tissue receptors

**Explanation: The main cause can be selected by its impact on variance of responsiveness.
d " is more corrected because the concept of drug concentration that reaches the receptor site can be included in pharamacokinetics which is controlled by ADME**

9. What does up-regulation of receptors refer to?

Correct Answer: a. Increase in the number of receptors

Explanation: Up-regulation of receptors involves an increase in the number of receptors, often leading to heightened sensitivity to a drug.

10. Which type of dose-response curve has the general shape described as a rectangular hyperbola?

****Correct Answer: c. Graded dose-response****

Explanation: Graded dose-response curves have a general shape described as a rectangular hyperbola, depicting the relationship between drug concentration and the magnitude of the response

More MCQs:

Certainly, here are 10 multiple-choice questions based on the text you provided:

1. Regarding "Graded dose–response relationships," find the wrong sentence from the following choices:

a. The response is a graded effect, meaning that the response is continuous and gradual.

b. Graded dose–response curves produce a graph with a rectangular hyperbolic shape.

c. Potency is not affected by receptor concentration or density in tissues.

d. Efficacy is the ability of a drug to elicit a response when it interacts with a receptor.

e. Maximal efficacy of a drug assumes that all receptors are occupied by the drug.

2. What is the effect of increasing the concentration of a potent drug compared to a less potent drug?

a. It decreases the drug's affinity for the receptor.

b. It decreases the response in both cases.

c. It requires a lesser amount of the potent drug to obtain a 50% effect.

d. It has no impact on the drug's pharmacologic effect.

e. It increases the number of drug-receptor complexes formed.

3. Regarding "Non-competitive antagonists," which statement is true?(Deleted)

a. Irreversible antagonists can be overcome by increasing the dose of agonist.

b. Allosteric antagonism involves reversible covalent bonds.

c. They have no impact on the number of receptors available for binding.

d. Uncompetitive antagonists are highly specific to particular receptors.

e. Non-competitive antagonists drive the equilibrium in favor of the active receptor state.

4. What is tachyphylaxis associated with in receptor tolerance?(deleted)

a. Rapid receptor down-regulation

b. Repeated use of large doses of receptor agonists

c. Long-term depletion of intracellular transmitter stores

d. Desensitization of receptors

e. Lack of response to high concentrations of agonists

5. Which type of antagonist combines with agonists and inactivates them away from tissues or receptors?

a. Competitive reversible antagonist

b. Physiological antagonist

c. Allosteric antagonist

d. Chemical antagonist

e. Uncompetitive antagonist

6. In the concept of drug-receptor binding, what happens as the concentration of free drug increases?(deleted)

a. The ratio of bound receptors to total receptors decreases.

b. The response to the agonist remains unaffected.

c. The equilibrium between active and inactive states of the receptor shifts.

d. Receptor up-regulation occurs.

e. Allosteric enhancement is triggered.

7. Which factor affects potency, making some drugs more potent than others?

a. The efficiency of the stimulus-response coupling mechanism in tissue.

b. Receptor down-regulation.

c. The drug's maximal efficacy.

d. The presence of an allosteric antagonist.

e. The number of drug-receptor complexes formed.

8. What is the primary cause of response variation to drugs in individuals?

a. Pharmacokinetic factors

b. Genetic abnormalities in receptor function

c. Receptor up-regulation

d. Post-receptor defects inside cells

e. Concentration of endogenous receptor ligand

9. Which type of antagonist has affinity for receptors but no intrinsic activity or efficacy?(deleted)

a. Competitive reversible antagonist

b. Irreversible antagonist

c. Non-competitive antagonist

d. Allosteric antagonist

e. Uncompetitive antagonist

10. In the concept of drug-receptor binding, what is the effect of binding a drug to an allosteric site on an agonist receptor?

a. It decreases receptor affinity for agonists.

b. It has no impact on receptor conformation.

c. It enhances the effect of the agonist.

d. It reduces receptor binding to G proteins.

e. It shifts the dose-response curve to the left.

Answers with explaining :

Sure, here are the answers to the MCQs along with explanations:

1. Regarding "Graded dose–response relationships," find the wrong sentence from the following choices:

Correct Answer: c. Potency is not affected by receptor concentration or density in tissues.

Explanation: This statement is incorrect. Potency can be affected by receptor concentration or density in tissues. Potent drugs may elicit a response at low concentrations because they bind to a critical number of specific receptors with high affinity.

2. What is the effect of increasing the concentration of a potent drug compared to a less potent drug?

Correct Answer: c. It requires a lesser amount of the potent drug to obtain a 50% effect.

Explanation: This is true. Potent drugs require a lesser amount to achieve a 50% effect because they have a higher affinity for receptors and can elicit a response at lower concentrations.

3. Regarding "Non-competitive antagonists," which statement is true?

Correct Answer: e. Non-competitive antagonists drive the equilibrium in favor of the active receptor state.

Explanation: This is correct. Non-competitive antagonists drive the equilibrium toward the active receptor state, meaning they reduce the effectiveness of the receptor's response.

4. What is tachyphylaxis associated with in receptor tolerance?

Correct Answer: d. Desensitization of receptors

Explanation: Tachyphylaxis is associated with the desensitization of receptors. This occurs when agonist-induced changes in receptor conformation lead to receptor phosphorylation, reducing their ability to interact with G proteins.

5. Which type of antagonist combines with agonists and inactivates them away from tissues or receptors?

Correct Answer: d. Chemical antagonist

Explanation: Chemical antagonists combine with agonists and inactivate them away from tissues or receptors. They neutralize the agonist, preventing it from binding to receptors.

6. In the concept of drug-receptor binding, what happens as the concentration of free drug increases?

Correct Answer: c. The equilibrium between active and inactive states of the receptor shifts.

Explanation: As the concentration of free drug increases, the equilibrium between active and inactive states of the receptor shifts, affecting the receptor's responsiveness.

7. Which factor affects potency, making some drugs more potent than others?

Correct Answer: a. The efficiency of the stimulus-response coupling mechanism in tissue.

Explanation: The efficiency of the stimulus-response coupling mechanism in tissue can affect the potency of drugs, making some more potent than others.

8. What is the primary cause of response variation to drugs in individuals?

Correct Answer: a. Pharmacokinetic factors

Explanation: Variations in the concentration of drug that reaches the tissue receptors are primarily due to pharmacokinetic factors.

9. Which type of antagonist has affinity for receptors but no intrinsic activity or efficacy?

Correct Answer: a. Competitive reversible antagonist

Explanation: Competitive reversible antagonists have affinity for receptors but no intrinsic activity or efficacy, and they compete with agonists for binding to specific receptors.

10. In the concept of drug-receptor binding, what is the effect of binding a drug to an allosteric site on an agonist receptor?

Correct Answer:. Answer is (E)