

Part 9: Mechanisms of Localization of Radiopharmaceuticals

1. For Tc-MAA localization in the lungs, the mechanism is based upon
 - a. Phagocytosis of the albumin particles
 - b. Chemisorption
 - c. Capillary filtration
 - d. Microembolization of capillaries using precipitated human serum albumin particles
2. The uptake of Tc-MDP in bone tissue is based upon
 - a. Passive diffusion and exchange with hydroxide ions
 - b. Surface adsorption of the labeled phosphate on hydroxyapatite crystals
 - c. Phagocytosis by the bone matrix
 - d. Metabolic trapping
3. ^{18}F -FDG localizes in malignant tumors because
 - a. It undergoes phagocytosis in the mitochondria
 - b. It is a fatty acid analog and is readily taken up by tumors
 - c. It undergoes metabolic trapping
 - d. It is organified by a fluorination reaction
4. The mechanism of localization of In-111 Octreoscan in an insulinoma is called
 - a. Antigen-antibody reaction
 - b. Metabolic trapping
 - c. Chemisorption
 - d. Receptor binding
5. Imaging of the airways in the lungs is an example of
 - a. Chemisorption
 - b. Simple diffusion
 - c. Compartmental localization
 - d. Active transport
6. Imaging of tubular secretory function of the kidneys is an example of
 - a. Chemisorption
 - b. Simple diffusion
 - c. Compartmental localization
 - d. Active transport
7. Uptake of radioiodide by the thyroid is an example of
 - a. Chemisorption
 - b. Simple diffusion
 - c. Compartmental localization
 - d. Active transport

8. The transfer of Xe-133 gas across lipid membranes in the lungs into the blood stream is called

- a. Chemisorption
- b. Simple diffusion
- c. Compartmental localization
- d. Active transport

7. F-18 NaF may be used for bone imaging. Which of the following mechanisms describes its uptake in bone tissue?

- a. Chemisorption
- b. Simple diffusion
- c. Exchange diffusion
- d. Compartmental localization
- e. Active transport

8. For visualization of prostate cancer metastases following injection of In-111 ProstaScint, the operating mechanism is

- a. Antigen-antibody reaction
- b. Metabolic trapping
- c. Chemisorption
- d. Receptor binding
- e. Active transport

11. Which one of the following is NOT an example of Compartmental Localization?

- a. Pulmonary ventilation study w/ Xe-133 gas
- b. Cisternogram with In-111 DTPA
- c. Hepatobiliary study with Tc-99m Disofenin
- d. Voiding cystogram with Tc-99m SC

12. Which of the following represents Active Transport?

- a. Uptake and organification of radioiodide in the thyroid gland
- b. Uptake of Tc-99m MAG by the kidneys
- c. Uptake of Rb-82 ion by the heart
- d. a and c only
- e. All of the above

13. Which of the following represents Physicochemical Adsorption?

- a. Thrombosis imaging with Tc-99m AcuTect
- b. Spleen imaging w/ damaged labeled RBCs
- c. Bone imaging with Tc-99m labeled phosphate based bone agents
- d. a and c only
- e. All of the above

14. Which of the following monovalent cations is a β^+ emitter?

- a. Tl-201
- b. Rb-82
- c. K-43
- d. None of the above

15. Tc-99m MAA is used to assess pulmonary perfusion. Which ONE of the following statements is FALSE?

- a. The typical injection of MAA particles causes microembolization of ~350,000 capillaries
- b. The number of particles to be administered is reduced for a patient with pulmonary hypertension
- c. Approximately 1% of all capillaries in the lungs is occluded by the typical injection
- d. The biological half-life of Tc-MAA in the lungs is approximately 8 hours

