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科目： 藥理學  
節次： 7

國立臺灣大學 115 學年度碩士班招生考試試題

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一、選擇題（每題 2 分，共 20 分），請在答案卡上作答

- 下列何者與抗凝血藥物 warfarin 合併使用時，不會增加 warfarin 療效及使用者之出血風險？  
(A) Carbamazepine  
(B) Ketoconazole  
(C) Omeprazole  
(D) Erythromycin
- Cyclophosphamide 常用於治療急性淋巴性白血病，可能經由肝臟代謝產生何種毒性成分，造成出血性膀胱炎 (Hemorrhagic cystitis)？  
(A) Ifosfamide  
(B) Acrolein  
(C) Phosphoramide mustard  
(D) Carboxyphosphamide
- Cyclosporine A 為臨床常見之免疫抑制劑，常用於器官移植時的抗排斥用藥，請問其主要藥理作用機制為何？  
(A) 抑制 interleukins 之基因轉錄作用  
(B) 活化 Calcineurin，抑制免疫細胞之發炎反應  
(C) 增加 IgG 抗體合成  
(D) 抑制組織對發炎介質之反應
- 下列何種抗腫瘤藥物不屬於抗代謝物藥物 (Antimetabolites)？  
(A) Cytarabine (ara-C)  
(B) Capecitabine  
(C) Gemcitabine  
(D) Mitoxantrone
- 下列何種藥物因無法通過血腦障壁 (Blood-Brain Barrier；BBB)，而無法用於中樞系統之感染？  
(A) Chloramphenicol  
(B) Rifampin  
(C) Erythromycin  
(D) Sulfonamides
- 請問下列何者不是 Bevacizumab (BV) 臨床常見之副作用？  
(A) 高血壓  
(B) 皮膚炎  
(C) 血栓栓塞  
(D) 胃腸穿孔
- Ampicillin 常與下列何種藥物併用，用以治療對  $\beta$ -lactamase 有抗藥性的金黃色葡萄球菌 (S. aureus) 感染？  
(A) Clavulanic acid  
(B) Amoxicillin  
(C) Penicillin G  
(D) Cephalexin

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8. Opioid 類藥物與其 Mu ( $\mu$ ) receptor 結合後，會活化何種離子通道而使細胞膜電位產生過級化現象 (hyperpolarization)?  
(A)  $\text{Na}^+$   
(B)  $\text{Cl}^-$   
(C)  $\text{K}^+$   
(D)  $\text{Ca}^{++}$
9. 腸道手術前，臨床上可口服下列何種抗生素抑制腸道細菌生長?  
(A) Gentamicin  
(B) Streptomycin  
(C) Neomycin  
(D) Tobramycin
10. 大麻物質-Dronabinol 目前主要臨床用途為何?  
(A) 預防非類固醇抗發炎藥物引致之消化性潰瘍  
(B) 治療糖尿病性胃輕癱  
(C) 治療胃食管逆流疾病  
(D) 預防癌症化學療法引致之嘔吐

二、選擇題 (每題 2 分，共 20 分)，請在答案卡上作答

11. Fidaxomicin and rifaximin are two antibiotics with distinct mechanisms. What process do they both inhibit?  
(A) Folate synthesis  
(B) DNA replication  
(C) RNA synthesis  
(D) Cell wall synthesis
12. Sulfonamides exert their antibacterial effect by acting as a competitive inhibitor of which molecule?  
(A) D-Ala-D-Ala  
(B) para-aminobenzoic acid (PABA)  
(C) Penicillin-binding protein (PBP)  
(D) Dihydrofolate reductase (DHFR)
13. The fluoroquinolone class of antibiotics, such as ciprofloxacin, primarily functions by inhibiting which bacterial enzymes?  
(A) Dihydrofolate reductase  
(B) RNA polymerase  
(C) Transpeptidases (PBPs)  
(D) DNA gyrase and topoisomerase IV
14. Among the various antibiotics that inhibit protein synthesis by targeting the 50S ribosomal subunit, which agent uniquely works by binding to the 23S ribosomal RNA to prevent the formation of the initiation complex?  
(A) Clindamycin  
(B) Erythromycin  
(C) Linezolid  
(D) Chloramphenicol

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15. Which of the following cephalosporins is classified as a third-generation agent and is particularly useful against *Pseudomonas aeruginosa*?
  - (A) Cefazolin
  - (B) Cefepime
  - (C) Cephalexin
  - (D) Ceftazidime
  
16. A patient with a complicated skin infection caused by a vancomycin-resistant enterococci (VRE) strain is being treated with a semisynthetic lipoglycopeptide. Which of the following agents has an extremely long half-life ( 10 days) allowing for once-weekly dosing and possesses an additional mechanism of inhibiting RNA synthesis?
  - (A) Minocycline
  - (B) Daptomycin
  - (C) Telavancin
  - (D) Oritavancin
  
17. Mepolizumab is a monoclonal antibody therapy used for severe asthma. What is its specific molecular target?
  - (A) The cysteinyl leukotriene receptor
  - (B) Interleukin-5 (IL-5)
  - (C) The  $\beta_2$  adrenergic receptor
  - (D) The portion of Immunoglobulin E (IgE) that binds to its receptors
  
18. Tiotropium is classified as a long-acting muscarinic antagonist (LAMA). How does it promote bronchodilation in patients with COPD or asthma?
  - (A) By preventing acetylcholine from binding to M3 receptors on airway smooth muscle
  - (B) By increasing the activity of adenylyl cyclase to produce more cAMP
  - (C) By inhibiting the synthesis of leukotrienes in the lipoxygenase pathway
  - (D) By desensitizing pulmonary stretch receptors involved in the cough reflex
  
19. A patient with hyperaldosteronism is treated with spironolactone and develops gynecomastia. Which alternative medication could be used to avoid this side effect?
  - (A) Mifepristone
  - (B) Eplerenone
  - (C) Fludrocortisone
  - (D) Hydrocortisone
  
20. A young patient is diagnosed with Addison's disease caused by autoimmune destruction of the adrenal gland. Which of the following is the most appropriate for treatment of this patient?
  - (A) Hydrocortisone
  - (B) Fludrocortisone
  - (C) Hydrocortisone + Fludrocortisone
  - (D) Betamethasone + Fludrocortisone

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三、問答題 (共 20 分)，請在答案卷上標明題號依序作答  
試述下列藥物之作用機制和主要臨床用途？(20%)

1. Telmisartan
2. Dobutamine
3. Rosuvastatin
4. Semaglutide
5. Acetazolamide

四、問答題 (共 20 分)，請在答案卷上標明題號依序作答

1. 為什麼肉毒桿菌毒素可以用於除皺紋？(3%)
2. 報載活潑少女整型手術時竟發高燒命危於手術間，請問這是怎麼回事？可否避免？(4%)
3. 女性為何比男性不耐酒量？(4%)
4. 作用在離子通道的口服降血糖藥作用機制為何？(5%)
5. Disulfiram 用以戒酒的作用機制為何？(4%)

五、問答題 (共 20 分)，請在答案卷上標明題號依序作答

1. Warfarin is a common anticoagulant that interacts with various medications, affecting its anticoagulant effect. When Warfarin is used in combination with fluvastatin, there is an increased risk of bleeding. However, if it is replaced with another drug, pravastatin, they can be used together safely. Please explain the pharmacological mechanism of Warfarin and discuss why Warfarin can be used with pravastatin but poses a bleeding risk when combined with fluvastatin. (10%)
2. Kymriah (tisagenlecleucel) is a revolutionary cell-based immunotherapy primarily used to treat certain types of blood cancers. Please explain its mechanism of action and describe its indications and associated risks. (10%)

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