

Blood & Immunology

[BL01](#) [Mar96] Which of the following decrease platelet aggregation & cause vasodilatation?

- A. PGE2
- B. PGF2alpha
- C. TBXA2
- D. PGD2
- E. PGI2**

[BL01b](#) Which is associated with inhibition of platelet aggregation?

- A. Prostaglandin I**
- B. Prostaglandin E
- C. Prostaglandin F
- D. ?

[BL02](#) [Mar96] [Jul99] [Apr01] [Jul02] [Feb08] Which ONE of the following causes bronchodilatation?

- A. PGE2**
- B. PGF2 alpha
- C. TBXA2
- D. LTB4
- E. LTD4

[BL03](#) [Jul97] [Apr01] In a patient receiving 24 units of blood over 2 hours, the complication most likely to be seen would be:

- A. Hypercalcaemia
- B. Increased oxygen uptake in the lungs
- C. Coagulopathy**
- D. Hypokalaemia

[BL03b](#) [d] [Jul98] Problems of massive transfusion most commonly include:

- A. Metabolic alkalosis
- B. Hyperkalaemia**
- C. Coagulopathy due to hypocalcaemia

D. ?

[BL03c](#) [Jul99] [Apr01] The effect which is LEAST likely to occur shortly after transfusion of 25U of whole blood:

- A. Hypocalcaemia
- B. Dilutional coagulopathy
- C. Metabolic alkalosis
- D. Increased affinity of Hb for O₂
- E. [Hyperkalaemia](#)

[BL04](#) [Jul97] Which immunoglobulin (?MW 69,000) would exist as a monomer in tears, saliva & mucus (?secretions)?

- A. IgA
- B. IgG
- C. IgM
- D. IgE
- E. IgD

IgA:

- MW 170 000
- Second most abundant Ig in the serum
- Predominate class of Ig found in secretions (tears, saliva, colostrum, mucous)
- Synthesised by mucosal epithelial cells
- Exists primarily (but not exclusively!) as a dimer in the secretory form
- Activation of complement by the Alternate Pathway.

IgG:

- MW 160 000
- Most abundant Ig in the serum (75% of serum Ig)
- Exists as a monomer
- Protect against microbial infections by binding, recruiting, activating PMNs, NK cells, Monocytes.

IgM:

- MW 960 000
- The first antibody produced after antigenic stimulus
- Exists as a **pentamer**
- Potent activator of complement and excellent cytotoxin.

IgE:

- MW 180 000
- Lowest serum Ig concentration
- Are able to activate and degranulate mast cells
- Exists as a monomer

IgD:

- MW 180 000
- Act as an antigen receptor on B lymphocytes
- Has no known function in the serum
- Monomer

[BL05](#) [Jul97] [Jul01] [Feb04] Erythropoietin is a glycoprotein which:

- A. Stimulates red and white cell production **red**
- B. Is broken down in the kidney **liver**
- C. Has a half life of days **hours**
- D. Levels inversely proportional to haematocrit**
- E. Polypeptide B glycoprotein

[BL05b](#) [Mar99] Erythropoietin:

- A. Red cell maturation 24 to 72 hours. **rbc 2-3 days to appear but not maturation!**
- B. Inactivated by Kupffer cells
- C. Metabolised in liver**
- D. Half-life is 5 ?mins/hours

[BL06](#) [Jul97] Phagocytic cells:

- A. Capture bacteria in the blood
- B. ?

[BL07](#) [Jul97] [Jul99] [Feb00] [Apr01] Antithrombin III affects (?inactivates) which coagulation factor?

- A. XIIa (?XIa)
- B. Xa
- C. IIa
- D. IXa
- E. All of the above**

[BL08](#) [Mar98] Vitamin K (?neutralizes):

- A. Factor 5
 - B. Heparin
 - C. Antithrombin 3
 - D. Plasminogen
- (see also [BL10](#))

[BL09](#) [Mar98] [Jul98] [Mar99] [Jul01] [Mar03] [Jul04] Desmopressin:

- A. Increases factor 8 levels/activity. V2 selective analogue
- B. Anti-heparin effect
- C. Has pressor activity
- D. ?

[BL10](#) [Mar98] [Mar02] Post-translational modification occurs with:

- A. Factor V
- B. Von Willebrand factor
- C. Factor XII
- D. Protein C vitamin K
- E. ?

(Mar 2002 version of stem: Vitamin K dependent factors are:)

[BL11](#) [] [Mar98] [Jul98] [Jul99] [Jul00] Post-translational modification:

- A. Removal of introns
- B. Modification of amino acid residues in proteins
- C. Self-splicing
- D. tRNA involved

[BL12](#) [Mar98] [Feb04] Haemoglobin breakdown:

- A. Fe is excreted by the kidney
- B. Haem is broken down to biliverdin
- C. Haem is converted to bilirubin and transported to liver bound to albumin
- D. ?

1. The first reaction (catalysed by the microsomal enzyme haem oxygenase in the macrophages) converts haem to biliverdin, (opening the porphyrin ring), Fe^{++} and carbon monoxide.
2. The next step (catalysed by biliverdin reductase in macrophages) converts biliverdin to bilirubin.
3. The lipid soluble bilirubin (unconjugated) is carried in plasma bound to albumin.
4. Bilirubin is taken up by hepatocytes by facilitated diffusion
5. Bilirubin is conjugated with UDP-glucuronic acid to produce bilirubin monoglucuronide.
6. This is actively transported into the bile canaliculi and excreted.

BL13 [Jul98] Platelet activation will NOT occur without:

- A. Ca^{+2}
- B. Vessel wall damage - interferons can also cause activation
- C. Von Willebrand factor - helps stabilise binding to endothelium & binding of other platelets
- D. Fibrinogen - 2nd haemostasis - incr binding to fibrin
- E. ?Serotonin ?Factor VIII

BL14 [Mar99] [Feb00] [Jul01] Glycoprotein CD4 is expressed on:

- A. Cytotoxic T cells
- B. Suppressor T cells
- C. Helper T cells
- D. Plasma cells

BL15 [Mar99] [Jul99] [Jul02] Immunoglobulin G (IgG) has:

- A. 4 heavy chains
- B. 4 light chains
- C. 2 heavy & 2 light chains
- D. Variable heavy & light chains
- E. None of the above

Jul99 version: Immunoglobulin (?antigen specificity is determined by:)

- A. Variable heavy & light chain
- B. Constant heavy & variable light chain
- C. Constant light & variable heavy chains
- D. Constant both chains

[BL16](#) [Jul99] Platelet activation requires:

- A. Vessel wall damage
- B. Calcium ion**
- C. Cyclooxygenase
- D. vonWillebrand factor
- E. Prostaglandins

[BL17](#) [Jul99] [Apr01] Cytokines are:

- A. Low molecular weight proteins**
- B. Enzymes
- C. Autacoids - **can be paracrine as well**
- D. Immunoglobulins
- E. Interleukins

[BL18](#) [Jul99] [Mar02] [Mar03] [Jul03] Which of the following statements about FFP is NOT true?

- A. Must be group specific **ABO**
- B. Does not need to be cross matched
- C. Contains all clotting factors except for platelets
- D. Contains clotting factors except deficient in factors V and VIII. **is deficient in these but contains them**
- E. Is not useful in treating ?protein C deficiency/ coagulopathy
- F. Does not contain albumin**
- G. Does not contain anticoagulant**
- H. Contains an anti-thrombotic protein

FFP contains all plasma proteins (incl albumin), all clotting factors including the labile factors V and VIII albeit in low concentrations (on thawing) and anticoagulant proteins C,S and Thrombomodulin.

[BL19](#) [Feb00] [Mar03] [Jul03] Complement activation requires

- A. Antigen antibody complex**
- B. Opsonisation of bacteria
- C. Helper T cells
- D. Previous exposure to antigen
- E. Plasma proteins

[BL20](#) [Jul00] Tissue Bound Macrophages:

A: Derived from megakaryocytes - **platelets**

B: Not found in the lung & liver

C: Stimulated by lymphokines

D: Digest bacteria using lymphokines

Killing/digestion of bacteria by macrophages is accomplished by several methods:

1. **Reactive oxygen species**
2. **Nitric oxide production by iNOS (inducible Nitric Oxide Synthase)**
3. **Other proteins including lysozyme, lactoferrin, defensins**
4. **Hydrolytic enzymes**

E: ?

Also recalled as: Fixed macrophages in lungs & liver:

A. Originate in the bone marrow and migrate to their site of action as megakaryocytes

B. Kill bacteria in phagosomes by lymphokines

C. Are activated by cytokines secreted by activated T cells

D. Part of humoral immunity - **innate**

[BL21](#) [Jul00] HLA antigens are found on: **class I nucleated cells, class II on APCs ie B & T cells**

A. All leucocytes

B. B cells

C. T cells

D. All nucleated cells

[BL21b](#) HLA is expressed on:

A. Antigen presenting cells

B. T-cells

C. B-cells

D. Red cells

E. All nucleated cells

[BL22](#) [Apr01] For a T cell to react to (?recognise) a foreign antigen:

- A. Opsonisation
- B. The antigen presenting cell presents antigen
- C. Needs T helper cells
- D. Prior exposure to Antigen required

Alt version: Antigen binding to T lymphocytes requires

- A. Previous exposure
- B. Presentation of antigen by "Antigen presenting cells"
- C. Active T helper cells
- D.
- E. None of the above

[BL23](#) [Apr01] Thrombin inhibits

- A. factor Xa
- B. tPA
- C. protein C
- D. platelets
- E. none of the above

[BL24](#) [Apr01] Lymphocytes

- A. Don't remain in the lymph system
- B. Are formed in the bone marrow in adults
- C. Formed from neonatal precursor cells
- D. Produced by tissues derived from foetal bone marrow
- E. ?

[BL25](#) [Jul01] [Jul04] Rejection of an allograft is due to:

- A. Non specific immunity
- B. Supressor T cells
- C. Helper T cells
- D. Cytotoxic T cells
- E. HLA cytotoxic reaction

[BL26](#) [Jul01] [Feb04] [Jul04] Haemoglobin contains:

- A. One protoporphorin ring and 4 ferrous ions
- B. Four protoporphorin ring and one ferrous ion

- C. Four protoporphyrin rings and four ferrous ions
- D. One protoporphyrin ring and one ferrous ion
- E. None of the above

[BL27](#) [Jul03] Blood viscosity:

- A. Is independent of the white cell count
- B. Falls as haematocrit rises
- C. Is independent of vessel diameter **Viscosity of blood, relative to that of water increases as a function of tube diameter up to a diameter of about 0.3mm**
- D. Falls as flow rate rises **The apparent viscosity of blood diminishes as the shear rate (ed: read velocity) increases, a phenomenon called shear thinning"**
- E. Is independent of fibrinogen concentration

Factors affecting blood viscosity:

- Hematocrit (as Hct increases, there is a disproportionate increase in viscosity)
- Temperature: As temperature decreases, viscosity increases (increases ~ 2% for each °C decrease in temperature)
- Flow rate of blood: Low flow rates -> marked increased in viscosity -> Increased cell-to-cell and protein-to-cell adhesive interactions -> Erythrocytes adhere to one another (rouleau formation)
- Vessel diameter: Small vessel diameters (e.g., in arterioles less than 300 microns), there is a paradoxical decrease in blood viscosity (Fahraeus-Lindqvist effect). This occurs because the hemotocrit decreases in small vessels relative to the hemotocrit of large feed arteries.

[BL28](#) [Feb04] Comparing thrombosis to normal coagulation, which of the following is NOT true?

- A. Thrombosis is always pathological
- B. Thrombosis requires venous stasis
- C. Thrombosis does not involve platelet activation

[BL29](#) [Jul04] Platelets:

- A. Binding to endothelial glycoprotein requires hydrolysis of ATP
- B. ADP from platelet granules causes aggregation

[BL30](#) Cross-matching involves comparing donor's

- A. red cells with recipient's red cells
- B. red cells with recipient's serum**
- C. serum with recipient's red cells
- D. serum with recipient's serum
- E. whole blood with recipient's whole blood

[BL31](#) [Feb12](#) Regarding plasma proteins:

- A. Difference between total protein and albumin concentration is accounted by immunoglobulins
- B. Low albumin is always associated with liver disease
- C. Most are in anionic form**
- D. ?
- E. ?

[BL32](#) [Feb12] Which of the following is not true with regards to hypersensitivity reactions:

- A. Type I hypersensitivity is mediated by IgE
- B. Type I hypersensitivity does not involve complements
- C. Type II hypersensitivity does not involve IgM/IgG**
- D. Always involve T Cells
- E. ?

[BL33](#) [Feb12] What changes can be found in stored blood at Day 28?

- A. pH less than 7.0**
- B. K level rises to 10mM
- C. 2,3 DPG stays constant
- D. Decreased free Hb
- E. Increased glucose concentration

[BL34](#) [Jul06] [Feb07] Bilirubin metabolism:

- A. Bilirubin transferred to liver bound to albumen**
- B. is only produced from the breakdown of haemoglobin
- C. is produced in the reticuloendothelial system
- D. Liver conjugates bilirubin and secretes into bloodstream
- E. Stercobilinogen is excreted in the urine

[BL35](#) [Feb08] Plasmin cleaves all the following except

- A. II
- B. V
- C. VII**
- D. VIII
- E. XII

Plasmin digests fibrin fibers and some other protein coagulants such as fibrinogen, Factor V, Factor VIII, prothrombin [II] and Factor XII.