The Royal College of Pathologists

Part 1 examination

Immunology: First paper

Tuesday 25 September 2007

Candidates must answer FOUR questions ONLY

Time allowed: 3 hours

1 A healthy 25 year old man steps on a rusty nail and experiences a penetrating injury to his foot. Three days later, he goes to his GP with a painful foot, fever and rigors. Discuss how his immune response will have been mobilised in the intervening 72 hours.

2 Write short notes on each of the following:

a. Molecular mimicry in the pathogenesis of autoimmune disease.
b. DNA repair defects leading to immunodeficiency.

3 Write short notes on each of the following:

a. The immunological basis for sublingual immunotherapy to grass pollen allergens.
b. The role of co-stimulatory molecules in the induction of CD4 T cell responses.

Please turn over for Questions 4 and 5

4 Answer both parts of this question using a short-notes format.

a. Discuss the evidence that genetic factors influence the development of inflammatory bowel disease (IBD).
b. Outline immune defence mechanisms mobilised during pneumococcal infection. How can specific genetic defects lead to susceptibility to severe pneumococcal sepsis?

5 Write short notes on each of the following:

a. Antibodies to cyclic citrullinated peptides.
b. B cell activating factor (BAFF).
c. The pathogenesis of skin lesions in pemphigus vulgaris and pemphigoid. Indicate how the immunology laboratory can help in the diagnosis of these two diseases.

The Royal College of Pathologists

Part 1 examination

Immunology: First paper

Tuesday 27 March 2007

Candidates must answer FOUR questions ONLY

Time allowed: 3 hours

1. Give a brief overview of anti-viral immunity. Discuss how primary immunodeficiencies characterised by increased susceptibility to latent viruses have added to our understanding of protective immunity to viruses

2. Outline the molecular mechanisms known to result in primary antibody deficiency. How does this knowledge contribute to our understanding of mechanisms of immunoglobulin class switching?

3. Outline a classification of:

   a) urticaria

   b) angiooedema.

   Using examples from your classification explain our current understanding of the pathophysiology of urticaria and angiooedema. Briefly outline the pharmacological interventions that can counteract the mechanisms underlying urticaria and angioedema. You may use a tabulated format in this answer.

Please turn over for Questions 4 and 5

4. What is meant by chemotaxis? Name three chemotactic agents and indicate their origin. Briefly describe the process of neutrophil chemotaxis. Briefly outline how different types of primary immunodeficiency diseases can impair chemotaxis.

5. Discuss the use of biological agents in the treatment of immunologically mediated diseases. Illustrate your answer with reference to anti-TNF agents, anti-IL1, recombinant Cytokines, Anti-IgE, and anti-CD20. You should include in your answer, evidence-based uses, current understanding of their mechanisms of action and principal adverse effects.

The Royal College of Pathologists

Part 1 examination

Immunology: First paper (to be attempted by ALL candidates)

Tuesday 19 September 2006

Candidates must answer FOUR of the following questions ONLY and must answer ALL parts of the multi-part questions

Time allowed: 3 hours

1. What innate and adaptive mechanisms limit viral replication within the human body? Illustrate how immunodeficiencies in humans illuminate the importance of these pathways.

2. Write short notes on the mechanism of action of each therapeutic agent when used as indicated below:
   a. Anakinra (Kineret) in rheumatoid arthritis
   b. Tranexamic acid in hereditary angioedema
   c. Sirolimus (Rapamune) in renal transplantation
   d. Etanercept in Crohn's disease.

3. Write short notes on:
   a. The use of bone marrow transplantation for the treatment of primary immunodeficiencies.
   b. The use of Gene therapy for the treatment of primary immunodeficiencies.

   In your answer please review the indications, potential complications and outcomes of the two procedures.

Please turn over for Questions 4 and 5

4. Answer **both** parts of this question:
   a. Discuss the cellular and molecular mechanisms involved in the induction of immunological tolerance
   b. Describe how tolerance induction may fail or may be by-passed, using clinical examples where relevant.

5. Answer **both** parts of this question:
   a. Give a classification of immunoprophylaxis (immunization) giving examples of each type of vaccine
   b. Critically discuss the current use of active and passive immunization in the United Kingdom.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 14 March 2006

IMMUNOLOGY

First Paper *(to be attempted by ALL candidates)*

Candidates must answer FOUR questions ONLY and must answer ALL parts of multi-part questions

Time allowed - THREE HOURS

1 What do you understand by the term "autoimmune disease"? Discuss the known mechanism(s) of autoimmunity in each of the following human diseases, with reference to the pathogenic antigen and known genetic factors:

a) Reiter's syndrome
b) Guillain-Barré syndrome following *Campylobacter jejuni* infection
c) APECED syndrome
d) Type-I diabetes mellitus

2 Describe the chromosomal organisation of the genes that code for the B cell (BCR) and T cell (TCR) antigen receptor repertoire and the molecular mechanisms that contribute to the diversity of this immune repertoire. Include in your answer possible gene defects in the generation of antigen receptor diversification that lead to immune deficiency.

Please turn over for Questions 3, 4 and 5

3 Discuss the potential role(s) of infection in the development of allergic disease. What is the evidence for and against the hygiene hypothesis as a significant factor contributing to the rising incidence of allergic disease?

4 Discuss the role of Toll-like receptors in immune responses and in the pathogenesis of disease.

5 Write short notes on each of the following:

a) The mechanisms that HIV utilises to evade protective Immune responses
b) Mechanisms of Renal Allograft Transplant Rejection
c) Mechanisms of immunity to the Influenza Virus

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 20 September 2005

IMMUNOLOGY

First Paper ***(to be attempted by ALL candidates)***

Candidates must answer FOUR questions ONLY and must answer ALL parts of multi-part questions

Time allowed - THREE HOURS

1. **Briefly** answer **each** of the following questions about the complement system:

   (a) How are pathogens recognised by the complement system?

   (b) What are the consequences of such pathogen recognition by the complement system?

   (c) How does the complement system influence the specific immune response?

   (d) What mechanisms regulate the actions of the complement system?

   (e) What pathological consequences follow from impaired regulation of the complement cascade?

Please turn over for Questions 2, 3, 4 and 5

2. What are the pathogenic mechanisms underlying the development of atopic dermatitis (atopic eczema)? In your answer describe the roles that cells of the immune system, relevant cytokines and other inflammatory mediators play in causing and maintaining eczematous lesions.

3. Outline how lymphoid tissue is organised within the body, and also how lymphocytes are organised within lymphoid tissues. Illustrate your answer with annotated diagrams. How is this organisation relevant to the generation of primary and memory antibody responses? **Briefly** indicate how currently identified genetic defects in antibody production influence the development of lymphoid tissue compartments.

4. Discuss the development and maturation of immunoglobulin class and subclass production. How may defects in these processes lead to harmful consequences? **Briefly** comment on the clinical utility of measuring the serum levels of immunoglobulin isotypes.

5. Answer **both** parts of this question:

   (a) Briefly outline the mechanisms involved in the migration of neutrophils from the intravascular compartment into infected tissues. How may defects in these mechanisms lead to disease?

   (b) Briefly summarise the mechanisms by which phagocytic cells kill microbes.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 15 March 2005

IMMUNOLOGY

First Paper ***(to be attempted by ALL candidates)***

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Give a brief overview of the innate immune system. Discuss how innate immunity contributes to anti-microbial immunity and how defects of innate immunity might lead to disease.

2. The association of specific HLA polymorphisms with autoimmune diseases has been known for over 30 years. Briefly outline the theories that have been proposed to explain this association. Critically evaluate the available evidence that supports these theories.

Please turn over for questions 3, 4 and 5

3. Write short notes on the physiological function of each of the following molecules and their relevance in diseases of the immune system:

   (a) Foxp3

   (b) IRAK-4

   (c) NEMO

4. Write short notes on each of the following:

   (a) The immunological mechanisms underlying the action of venom immunotherapy to treat wasp venom allergy

   (b) Bacterial killing mechanisms that operate within neutrophils

   (c) The potential risks of intravenous immunoglobulin therapy

5. Compare and contrast the clinical manifestations, inheritance patterns, molecular pathologies and outcomes of the immunodeficiency diseases collectively known as “Hyper IgM syndromes”.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 21 September 2004

IMMUNOLOGY

First Paper ***(to be attempted by ALL candidates)***

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Common variable immunodeficiency (CVI) is increasingly considered to be a diagnosis of exclusion. What inherited disorders of immunity should you consider before making the diagnosis of CVI? Explain the mechanisms by which the inherited disorders you list produce defects in antibody production.

2. Write brief answers to **all** sections of the following question:

   (a) What are the indications for the use of mycophenolate mofetil as an immunosuppressive agent? Briefly outline the potential complications of this therapy.

   (b) Outline the current experience of gene therapy for primary immunodeficiencies. What are the potential risks of gene therapy?

   (c) Describe the role of the FcRn receptor (Brambell receptor) in homeostasis of IgG.

Please turn over for Questions 3, 4 and 5

~~2.~~3. Explain the immunopathological mechanisms that underlie the three main auto-inflammatory syndromes: Familial Mediterranean Fever, TNF Receptor Associated Periodic Syndrome and the Hyper IgD syndrome. Briefly discuss how understanding of these mechanisms may help to devise successful treatment strategies.

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4. What are the amyloidoses? How are they classified? What are the possible complications of amyloidosis? How can amyloidosis be diagnosed? What are the principles underlying the clinical monitoring and treatment of patients who have amyloidosis?

5. In what anatomical sites are lymphocytes found in the gastrointestinal tract? How are lymphocytes organised within these sites (please supplement your answer by annotated diagrams)? How do they get there? What mechanisms regulate their entry and exit from these sites? Briefly comment on the physiological significance of the anatomical organisation and physiology of migration of lymphocytes within the gastrointestinal tract.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 16 March 2004

IMMUNOLOGY

First Paper *(to be attempted by ALL candidates)*

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Define the term "chemokine". Briefly outline pathways of lymphocyte migration in within primary and secondary lymphoid organs. Indicate the physiological role of chemokines in maintaining these pathways.

2. Outline the mechanisms that generate and maintain tolerance in T cells. Discuss how defects in (a) central and (b) peripheral T cell tolerance may lead to disease.

3. Outline the structure and function of leucocyte Fc receptors.

4. Outline the critical stages in the production of high affinity T cell dependent antibodies. How may abnormalities in this pathway lead to disease?

Please turn over for Question 5

5. Write short notes on each of the following:

   (a) The mechanisms that HIV utilises to evade protective immune responses

   (b) Mechanisms of renal allograft rejection and strategies for its prevention

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 23 September 2003

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Classify intrinsic (primary) defects which result in defective neutrophil function. How do these intrinsic defects lead to disordered neutrophil physiology and disease?

2. What are the current explanations for the rise in prevalence of IgE mediated allergic disease? How do environmental factors influence the homeostasis of IgE antibody production?

3. What are the currently identified molecular defects leading to primary antibody deficiency? How has this knowledge helped to improve our understanding of the physiology of B cell development and function?

PLEASE TURN OVER FOR QUESTIONS 4 & 5

4. In terms of their specificity and sensitivity, compare and contrast the performance of the following investigations in SLE;

   Atinuclear antibodies by indirect immunofluorescence (IIF), antibodies to the kinetoplast of *Crithidia luciliae* by IIF and to ds-DNA by ELISA.

   In your answer you should describe briefly how the epitopes tested for relate to the pathogenesis of the disease and how this and the antibody isotype(s) tested for affect sensitivity and specificity. How do the specificity and sensitivity of these tests limit their usefulness in screening, diagnosis and patient management?

5. Describe the pathways involved in the control of lymphocyte apoptosis. How may defects in regulation of these pathways lead to disease?

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 23 September 2003

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. **Please answer <u>either</u> Option A or Option B:**

Option A

Discuss the indications and contraindications for self-administered adrenaline. Summarise in your answer evidence that supports the use of this therapeutic measure, and discuss the mechanisms by which it might be beneficial or harmful.

Option B

Classify immunologically mediated adverse reactions to drugs and give relevant examples of each category. Using penicillin allergy as an example discuss the clinical utility and pitfalls of methods that are currently available for diagnosing each category of adverse reactions.

2. A 47-year-old female patient of Afro-Caribbean origin presents with intermittent angioedema, without urticaria. The swellings take a few hours to reach their peak and last 1-4 days.
   (a) Outline your differential diagnosis
   (b) Indicate how additional features in her history may help you in arriving at a diagnosis
   (c) Detail the further investigations you would undertake, giving a critical commentary on the potential diagnostic value of each.
   (d) Briefly outline the therapeutic options available for each of your suggested differential diagnoses, and indicate the advantages and disadvantages of each option.

3. Compare and contrast (a) the clinical features and (b) the underlying molecular defect found in the following auto-inflammatory diseases: Familial Mediterranean Fever, Hyper-IgD syndrome, Familial cold auto-inflammatory syndrome (Familial cold urticaria), TNF receptor associated periodic syndrome (TRAPS).

4. Discuss how the use of Flow-Cytometry for phenotypic analysis and functional assessment of cells of the immune system, can aid the diagnosis of primary immunodeficiency diseases.

5. **Please answer <u>either</u> Option A or Option B:**

Option A

A 28 year old man with a diagnosis of Common Variable Immuno Deficiency (CVID) has been under the care of a specialist in General Internal Medicine and has received IV-Ig for 6 years. Over the past 3 months, his ALT level has steadily increased to 100U/L (normal range <50 IU/L. He is referred to your specialist Immunology centre for a second opinion.

(a) Outline how you further evaluate and manage this patient?
(b) Briefly outline the procedures followed by Immunology teams to reduce the risk of and monitor for immunodeficiency-related and treatment-related liver disease in this type of patient.

Option B

A 30 year old female has a history of three episodes of bacterial meningitis within the past five years. *Streptococcus pneumoniae* was the causative organism on two occasions and there was no microbial isolate from CSF or blood on the third occasion. Discuss how you would further investigate this patient.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 18 March 2003

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Discuss the discrimination between self and non-self by the adaptive immune system.

2. Outline the innate immune system. Discuss the relevance of innate immunity to host immune defences and how defects of it might lead to disease.

3. Write short notes on each of the following:
   a) IL-6,
   b) Mannan binding lectin,
   c) Chemokines and HIV infection,
   d) C-reactive protein.

4. Write short notes on each of the following:
   a) B cell heterogeneity,
   b) KIR genes and their receptor products,
   c) Compare and contrast the receptor for antigen on T cells and B cells,
   d) Adhesion molecules in immune activation.

5. Write short notes on each of the following:
a) The importance of theTh1, Th2 balance in the pathogenesis of atopic disease,
b) Risk factors in the development of atopic disease,
c) The eosinophil in allergic inflammation.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 18 March 2003

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Discuss the causes, investigation and management of urticaria.

2. You are signing out reports in your laboratory and identify the following results from a 62 year old male patient: IgG 3.03 g/l (7-16 g/l), IgA 0.54 g/L (0.8-4.5g/l), IgM <0.18g/l (0.5 – 3.0 g/l). The clinical details describe a history of recurrent chest infections over the past 3 years. He has been on treatment for presumed psoriatic arthritis for 25 years.

    a) Outline your differential diagnosis.
    b) Detail the further investigations you would undertake, giving a critical commentary on the potential diagnostic value of each.
    c) For each of your suggested differential diagnoses, tabulate the typical presentation, chief clinical features, necessary treatment and prognosis.

3. Write short notes on each of the following:
    a) Wiskott Aldrich syndrome,
    b) Gene therapy for Severe Combined Immunodeficiency,
    c) ADA deficiency,
    d) X-linked lymphoproliferative disease.

[Turn over

4. Using the short notes format comment as requested on the following case details.

   A 27 year old lady presents with severe anaemia, Hb 8.4 g/dl, MCV 65, iron deficiency confirmed by a low serum ferritin and raised iron binding capacity. There is no history of bleeding from the gastro-intestinal tract, but of intermittent diarrhoea for years and her GP has previously investigated her for iron deficiency without a specific cause being identified.

   a) Your differential diagnoses including preferred diagnosis with reasons.
   b) The immunological investigations that you would use in her work up
   c) The advantage of those investigations over any alternative methods that may be currently available.
   d) For your preferred diagnosis issues you consider likely to be important in discussing the diagnosis, treatment and prognosis with the patient.

5. Write short notes on each of the following:
   a) Quality control,
   b) Quality assurance,
   c) Laboratory documentation and document control,
   d) The use of audit.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 24 September 2002

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Please answer **both** parts of this question.
   (a) Explain the immunological events underlying the pathogenesis of coeliac disease.
   (b) What is the evidence that supports the importance of tissue matching of unrelated cadaveric transplant donor-recipient pairs?

2. What is our current understanding of the mechanisms by which high dose intravenous immunoglobulin produces a beneficial effect in inflammatory and autoimmune disorders?

3. Write short notes on **each** of the following:
   (a) mechanisms of bacterial killing operating within neutrophils,
   (b) regulatory T cells,
   (c) structure and function of Interferon gamma receptors,
   (d) B-cell activating factor (BAFF).

4. Describe the B-cell subsets located within secondary lymphoid organs. Discuss the way members of each subset are selected from the pool of immature B cells and factors that determine the survival of peripheral B cells. What is known of the different circumstances in which the members of each subset can differentiate into antibody secreting cells?

5. Discuss the mechanisms which contribute to the development of an antigen-

specific IgE response following mucosal exposure to a potential allergen. At each step, where relevant, include a discussion on how possible therapeutic interventions may work.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

Tuesday 24 September 2002

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Please answer **both** parts of this question.

   (a) An 18 month old, female Caucasian was referred with a history of adverse reactions to her primary immunisation, resulting in the interruption of her immunisation programme. Two hours after her first Diphtheria, Tetanus, Pertussis (DTP) and Haemophilus b (Hib), immunisation administered at two months of age, she developed a 3cm diameter swelling of the injection site. Twenty-four hours after receiving the vaccines she became febrile (38^{o} C), slightly wheezy and developed an erythematous rash over her face, arms and back of legs. These symptoms resolved within 48 hours.

   An hour after the second routine immunisation which was administered a month later, she became lifeless with rolling eyes and blue lips. She received emergency medical treatment at the Accident and Emergency Department of the local hospital.

   There is also a history of allergy to eggs; 15 minutes after being given a soft-boiled egg at the age of 8 months, the child developed an urticarial rash and vomited. An antihistamine was given and the symptoms subsided within 30 minutes.

   The Consultant Paediatrician in charge telephones for advice on:
   1. completion of primary immunisation,
   2. the advisability of MMR vaccination.

Briefly outline the problem you judge is presented by this enquiry and how you would deal with the specific points of advice required by your Paediatrician colleague.

[Turn over for Part B of Question 1

(b) A 62 year old Caucasian man has a six month history of total alopecia, chronic fungal infection of the nails and persistent oral candidiasis. There is a three month history of diarrhoea and he was found to have CMV colitis, on histology. He has no risk factors for HIV infection and there is nothing obvious in the history to suggest secondary immunodeficiency. He has a history of travel to Central America.

Investigations are as follows: Serology for HIV 1 and 2 negative. CMV, Hepatitis B and Hepatitis C serology are also negative; Haemoglobin and Red Cell Indices are normal; White Cell count, is 5.4 X 10^9/l (normal range, 4 -11 X 10^9/l), with an absolute Lymphocyte count of 1.0 X10^9/l (normal range 1.5 - 4 X10^9/l) and routine biochemistry normal; antinuclear antibodies are negative. Serum Immunoglobulin levels are as follows: IgG 4.8 Grams per litre (lower end of normal range 6.3 Grams / litre); IgM 0.13 Grams per litre (lower end of normal range 0.5 Grams per litre); IgA 0.07 Grams per litre (lower end of normal range of 0.8 Grams per litre).

What is your differential diagnosis? Briefly outline how you would investigate him further to arrive at a definitive diagnosis, indicating the reasons for your choice of investigations.

2. Discuss the indications, disadvantages and adverse effects of monoclonal antibody therapies, using Campath-1 (anti-CD52), anti-TNF (infliximab), and Anti-CD20 to illustrate your answer.

3. Describe the role of the Immunology laboratory in the investigation of dermatological disorders.

4. Write short notes on **each** of the following:
   (a) defects in immunoglobulin class switching,
   (b) infections of the central nervous system in immunocompromised patients,
   (c) diagnosis and management of the antiphospholipid syndrome,
   (d) monoclonal gammopathy of undetermined significance.

5. Please answer **both** parts of this question:

   (a) A 43 year old non smoking male presents with ischaemic, ulcerating lesions on his toes. He had developed an intermittent purpuric rash on his legs for the past 6 months. He denies other symptoms and examination is otherwise unremarkable.

   Rank your differential diagnosis list with reasons. List the investigations you would request at his initial visit and discuss their interpretation. Indicate the second tier of investigations you would consider and give your reasons for this selection.

[Turn over for Part B of Question 5

(b) A 25 year old female presents with a 6 month history of a peripheral polyarthritis. She had a left, branch retinal vein occlusion 3 months previously. Over the past two months she gave a history of intermittent fever and night sweats. Recently, she has developed intermittent central abdominal pain, with onset about one hour after meals.

General Practitioner's investigations revealed protein 2+ and blood 1+ on urine dip-stick examination, weakly positive anti-nuclear antibodies and borderline positive rheumatoid factor. On examination, there is no obvious swelling of her joints or skin rashes. All her peripheral pulses are palpable and undiminished. There are several small blackened areas over the nail folds of her fingers.

Discuss the differential diagnosis of this patient. What further tests would you perform, and how would you interpret the results obtained?

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

March 2002

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed – THREE HOURS

1. How are complement pathways regulated and how do defects in regulation lead to disease?

2. Discuss the pathways of apoptosis with reference to lymphocyte homeostasis. How may defects in these pathways lead to human disease?

3. What are the mechanisms of solid organ graft rejection and how might tolerance be achieved?

4. Discuss the indications for and adverse effects of specific allergen immunotherapy (desensitisation). What are the current ideas about the mechanisms underlying this therapy?

5. Write short notes on <u>four</u> of the following:
   (a) The molecular defects underlying the periodic fever syndromes,
   (b) The genetic basis for variation of serum levels of mannose binding lectin and the clinical relevance of such phenotypic variation,
   (c) The genetic factors important in the development of atopic disease,
   (d) Genetic susceptibility to HIV infection and rapid disease progression,
   (e) The molecular defects underlying the hyper IgM syndrome.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

March 2002

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed – THREE HOURS

1. Classify the primary vasculitides. How may the immunology laboratory aid in the diagnosis and management of these disorders?

2. A 26 year-old man has a ten year history of recurrent bronchitis and sinusitis. He has clubbing of the fingers and clinical features of right heart failure. What is your approach to his investigation and management?

3. Your clinic has been receiving increasing numbers of referrals for urgent assessment of patients who have had their operations cancelled due to possible latex allergy. Draft an evidence-based policy to deal with these patients in a clinically appropriate and cost-effective manner.

4. Discuss the role of the immunology laboratory in the diagnosis and management of immunologically-mediated diseases of the gut.

5. Write short notes on <u>each</u> of the following:
   (a) Penicillin Allergy,
   (b) Adverse effects of anti-tumour necrosis factor (TNF) alpha therapy,
   (c) Prion transmission by human plasma products.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

March 2001

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Write short notes on EACH of the following:
   (ii) donor/recipient matching for renal transplantation
   (iii) nomenclature of the HLA system
   (iv) influence of the genetic make-up of the host on HIV-pathogenesis.

2. Discuss the utility of monoclonal antibodies in the diagnosis and therapy of immunologically mediated diseases.

3. Compare and contrast the ways in which the following vaccines induce protective immunity: measles, mumps, rubella (MMR) vaccine; 23 valent pneumococcal polysaccharide vaccine; Meningococcal Group C conjugate vaccine; Pertussis vaccine. What are the main adverse affects of each vaccine?

4. Discuss the role of innate immunity, in the maintenance of good health in humans.

5. Discuss the role of T cells in the pathogenesis of autoimmune disease.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

March 2001

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. A six month old Asian boy presented with failure to thrive, hepatosplenomegaly, cervical lymphadenopathy and chronic diarrhoea. A lymph node biopsy revealed collections of foamy macrophages surrounded by a sparse lymphocytic infiltrate. The macrophages contained numerous acid and alcohol fast bacilli. Discuss how you would investigate and manage this patient.

2. Write short notes on EACH of the following:
   (ii) immunodeficiency associated with thymoma
   (iii) X-linked lymphoproliferative syndrome (Duncan's disease)
   (iv) toxic shock syndrome.

3. Draft a patient information leaflet for use in your out-patient clinic for patients with:
   (ii) C1 inhibitor deficiency
   (iii) aspirin sensitive asthma.

4. You are asked by a Consultant Paediatrician at your hospital to formulate a protocol for the diagnosis and management of peanut allergy. Draw up a suitable protocol and discuss the evidence on which these guidelines are based.

5. Write an essay on immunologically mediated eye disease.

Part 1 Examination

September 2000

IMMUNOLOGY

First Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Discuss the concept of regulatory T cells. How does this concept fit in with established dogma on Th1 and Th2 cells?

2. Apoptosis is now recognised as a key mechanism in controlling cellular function. Describe the pathways involved in the control of lymphocyte apoptosis, giving clinical examples of the consequences of dysregulation of these pathways.

3. Write short notes on the following:
   (i) T cell repertoire in health
   (ii) Role of somatic mutation in B cell maturation
   (iii) CD1

4. Compare and contrast antigen processing and presentation by MHC Class I and Class II pathways with reference to the cell surface and intracellular mechanisms involved.

5. EITHER
   Review the contribution of eosinophils to allergic disease.
   OR
   Discuss, with examples to illustrate your answer, the various mechanisms by which therapeutic antibodies may act in vivo.

THE ROYAL COLLEGE OF PATHOLOGISTS

Part 1 Examination

September 2000

IMMUNOLOGY

Second Paper

Candidates must answer FOUR questions ONLY

Time allowed - THREE HOURS

1. Discuss the role of immunomodulation of the TNF- /TNF receptor axis and its relevance to clinical disease.

2. Critically evaluate the current laboratory methods for assessment of anti-phospholipid antibodies and discuss their clinical utility and interpretation.

3. Your Trust's Risk Management Committee approaches you for advice on the formulation of guidelines for the care of latex allergic patients and staff. Review the clinical and scientific background to latex allergy and formulate advice to your Trust on what action should be taken.

4. A one month old girl, born to consanguineous parents, presents with persistent diarrhoea, shown to be due to Rotavirus. She has also had persistent napkin candidiasis with a generalised erythroderma, hepatosplenomegaly and is found to have an eosinophilia. Discuss the differential diagnosis, and indicate how you would further investigate her immune system to support your conclusions. Explain the reasons for your choice of investigations.

5. Write short notes on:
   (i) Complications of coeliac disease
   (ii) Dendritic cells in disease
   (iii) Lymphoma and immunodeficiency.