

**Higher Specialist Diploma - Portfolio Essay Titles for Submission in 2020**

**Regulations**

* Two essays must be included in the portfolio as evidence of experiential learning. At least one essay must come from the list below. The other essay can come from this list or the 2019 list of essays.
* Essays must demonstrate that the following learning outcomes are met:

***Knowledge and understanding***

* 1. Comprehensive understanding of highly complex scientific, technical and managerial aspects of the relevant field of biomedical science
	2. Critical awareness of current issues and developments within healthcare and biomedical science.

***Transferable skills***

* 1. Ability to reflect critically in order to inform best practice.
* Candidates are expected to use appropriate material from various sources within the essay.
* References must be numbered in the text and should appear in Vancouver format as outlined in the Higher Specialist Diploma study guide, which is available on the website.
* Essays should be 3000 words (±10%), typed in double spacing with a font size of at least 12 point.
* You should note that all essays will be entered into an anti-plagiarism software detection system and if plagiarism is detected it will result in an automatic failure and ban from future assessments, pending the outcome of the appeals procedure if invoked.

**Important Points to Remember**

At this level, you should be able to demonstrate:

* a systematic understanding of knowledge and a critical awareness of current problems, much of which is at, or informed by, work at the forefront of the academic discipline
* a comprehensive understanding of techniques applicable to their own research
* originality in the application of knowledge
* a conceptual understanding that enables critical evaluation of current research in their discipline

In constructing your essay you should:

* critically evaluate/discuss
* judge the relevance and significance of information
* evaluate claims, inferences, arguments and explanations
* construct clear and coherent arguments
* form well-reasoned judgements and decisions
* integrate and appraise reading and research
* be original in your application of knowledge

**HSD Essay Titles for 2020**

**Cellular Pathology**

Critically appraise the histological, special stains, immunocytochemical enzyme histochemical and electron microscopic investigations of muscle and nerve tissue within Cellular Pathology.

Discuss and debate the educational training requirements for biomedical scientists in modern day Cellular Pathology

**Clinical Chemistry**

Critically evaluate the role of the Clinical Chemistry laboratory in the diagnosis and management of Thyroid disease.

**Starting References;**

* ACB, BTA (2006) *UK Guidelines for the Use of Thyroid Function Tests.* Available at: <https://www.british-thyroid-association.org/sandbox/bta2016/uk_guidelines_for_the_use_of_thyroid_function_tests.pdf> (Accessed 18-04-19)
* NICE (2018) *Clinical Knowledge Summaries – Hypothyroidism.* Available at: <https://cks.nice.org.uk/hypothyroidism#!topicSummary> (Accessed 18-04-19)
* NICE (2018) *Clinical Knowledge Summaries – Hyperthyroidism.* Available at: <https://cks.nice.org.uk/hyperthyroidism#!topicSummary> (Accessed 18-04-19)

Discuss the use of biomarkers for the investigation and management of patients with suspected acute coronary syndrome.

**Starting References;**

* Alan, H.B. *et al*. (2018) ‘Clinical Laboratory Practice Recommendations for the Use of Cardiac Troponin in Acute Coronary Syndrome: Expert Opinion from the Academy of the American Association for Clinical Chemistry and the Task Force on Clinical Applications of Cardiac Bio-Markers of the International Federation of Clinical Chemistry and Laboratory Medicine’, *Clinical Chemistry* 64(4), pp. 645-655.
* Boeddinghaus, J. *et al.* (2018) ‘Clinical Validation of a Novel High-Sensitivity Cardiac Troponin I Assay for Early Diagnosis of Acute Myocardial Infarction’, *Clinical Chemistry* 64(9), pp. 1347-1360.
* NICE (2014) *Acute coronary syndrome in adults.* Available at: <https://www.nice.org.uk/guidance/QS68>

**Cytopathology**

Discuss the role of immunocytochemistry in the differential diagnosis of metastatic adenocarcinoma in serous effusions

Discuss the current and future provision, relevance and importance of EQA in cytology

**Haematology**

Evaluate the role of the laboratory in detection, classification and treatment monitoring of acute myeloid leukaemia

Critically evaluate laboratory monitoring of extended half-life clotting factor products used for treatment of haemophilia

**Immunology**

Critically appraise the diagnostic accuracy and cost-effectiveness of component-resolved diagnostics in the investigation of allergy.

Discuss the role of flow cytometry in the diagnosis of Primary Immunodeficiency Disease.

**Leadership and Management**

Critically review values based staff recruitment and selection campaigns and how these differ from traditional methods of recruitment. Do you consider that this is an improved strategy or not, justifying your decision?

Technology is driving Pathology diagnostics towards a shrinking range of automated methodologies. Discuss how you would restructure the organisation of laboratories in a hub centre including how you would plan for future staffing models and staff training.

**Medical Microbiology**

Review the role of *Mycobacterium abscessus* in Cystic Fibrosis patients

**Starting References**

* Nice CF Guidelines - <https://www.nice.org.uk/guidance/ng78>
* Population-level genomics identifies the emergence and global spread of a human transmissible multidrug-resistant nontuberculous mycobacterium [Science. 2016 Nov 11; 354(6313): 751–757.](https://www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&retmode=ref&cmd=prlinks&id=27846606) doi: [10.1126/science.aaf8156](https://dx.doi.org/10.1126/science.aaf8156)
* Clair L. Preece, Thomas A. Wichelhaus, Audrey Perry, Amanda L. Jones, Stephen P. Cummings, John D. Perry, and Michael Hogardt. Evaluation of Various Culture Media for Detection of Rapidly Growing Mycobacteria from Patients with Cystic Fibrosis. [J Clin Microbiol](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4922094/). 2016 Jul; 54(7): 1797–1803. doi: [10.1128/JCM.00471-16](https://dx.doi.org/10.1128/JCM.00471-16)
* [Rongpong Plongla](https://www.ncbi.nlm.nih.gov/pubmed/?term=Plongla%20R%5BAuthor%5D&cauthor=true&cauthor_uid=28228494), Clair L. Preece, John D. Perry, and Peter H. Gilligan. Evaluation of RGM Medium for Isolation of Nontuberculous Mycobacteria from Respiratory Samples from Patients with Cystic Fibrosis in the United States. [J Clin Microbiol](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5405264/). 2017 May; 55(5): 1469–1477. doi: [10.1128/JCM.02423-16](https://dx.doi.org/10.1128/JCM.02423-16)
* [Maroun Sfeir](https://www.ncbi.nlm.nih.gov/pubmed/?term=Sfeir%20M%5BAuthor%5D&cauthor=true&cauthor_uid=29450214), Marissa Walsh, [Rossana Rosa](https://www.ncbi.nlm.nih.gov/pubmed/?term=Rosa%20R%5BAuthor%5D&cauthor=true&cauthor_uid=29450214),Laura Aragon, Sze Yan Liu, Timothy Cleary, Marylee Worley , Corey Frederick, and [Lilian M Abbo](https://www.ncbi.nlm.nih.gov/pubmed/?term=Abbo%20LM%5BAuthor%5D&cauthor=true&cauthor_uid=29450214). Mycobacterium abscessus Complex Infections: A Retrospective Cohort Study. [Open Forum Infect Dis](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5808791/). 2018 Feb; 5(2): ofy022. doi: [10.1093/ofid/ofy022](https://dx.doi.org/10.1093/ofid/ofy022)

# Discuss the epidemiology, pathogenesis and laboratory diagnosis of Legionnaires’ disease

**Starting References**

* Mercante, W. & Winchell, J.M. (2015) Current and Emerging Legionella for Laboratory and Outbreak Investigations. *Clinical Microbiology Reviews*, 28(1) 95-133
* Cunha, B, A., Burillo, A. & Bouza (2016) Legionnaires’ Disease. *Lancet*, 387 376-385
* Oliva, G., Sahr, T. & Buchriester, C (2018) The Life Cycle of *L. pneumophilia*: Cellular Differentiation is Linked to Virulence and Metabolism. *Frontiers in Cellular and Infection Microbiology*, 8(3) 1-12
* Khodr, A., Kay, E.,Gomez-Valero, L., Ginevra, C., Doublet, P., Buchrieser, C. & Jarraud S. (2016) Molecular Epidemiology, Phylogeny and Evolution of *Legionella*. *Infection, Genetics and Evolution* 43, 108-122
* CDC Legionella (Legionnaires’ Disease and Pontiac Fever) <https://www.cdc.gov/legionella/index.html>
* SMI ID 18: Identification of Legionella species <https://www.gov.uk/government/publications/smi-id-18-identification-of-legionella-species>

**Transfusion Science**

In early 2019, a small female child with neuroblastoma and the very rare antibody specificity, anti-Inb, and how a search for compatible donors was described on many social media sites.

Describe, in detail, the various antigens that belong to the Indian Blood Group System, how the antibodies react, their clinical significance in terms of both haemolytic transfusion reactions and haemolytic disease of the foetus and new-born, including relevant reasons, and in which ethnicities you would be most likely to find In(b-) blood donors.

**Starting References**

* + Badakere SS, Joshi SR, Bharia HM, Desai PK, Giles CM, Goldsmith KLG. Evidence for a new blood group antigen in the Indian population (a preliminary report). *In J Med Res* 1973; **61**: 563.
	+ Badakere SS, Parab BB, Bhatia HM. Further observations on the Ina (Indian) antigen in Indian populations. *Vox Sang* 1974; **26**: 400-403.
	+ Giles CM. Antithetical relationship of anti-Ina with the Salis antibody. *Vox Sang* 1975; **29**: 73-76.
	+ Jones B, Joshi S, Karamatic Crew V, Sheladiya A, Mendapra K, Thornton N. A new high incidence antigen of the Indian blood group system. *Transfusion Medicine* 2016; **26 (Suppl 2)**: 20.
	+ Henny C, Thornton N, Lejon Crottet S, Baglow L, Graber J, Niederhauser C, Hustinx H. An antibody against a novel high incidence antigen in the Indian blood group system. *Vox Sanguinis* 2018; **113 (Suppl 1)**: 231.
	+ Poole J, Tilley L, Warke N, Banks J, Ahrens N, Armstrong D, Williams M, Daniels G. Molecular basis of two novel high incidence antigens on CD44 (Indian blood group system). Abstract. *Transf med* 2005: **15 (Suppl. 1)**: 30.
	+ Reid ME, Lomas-Francis C, Olsson ML. *The Blood Group Antigen FactsBook.* 3rd edition, 2012, Academic Press.

Describe, with examples, how a person’s *HLA-DRB1* alleles may influence their ability to produce either certain antibody specificities, or multiple antibody specificities.

**Starting References**

* Mattcocci A, Pierelli L. Red blood cell alloimmunization in sickle cell disease and in thalassaemia: current status, future perspectives and potential role of molecular typing. *Vox Sanguinis* 2014; **106**: 197-208 (doi: 10.1111/vox.12086).
* Schonewille H, Doxiadis IIN, Levering WHBM, Roelen DL, Claas FHJ, Brand A. HLA-DRB1 associations in individuals with single and multiple clinically relevant red blood cell antibodies. *Transfusion* 2014; **54(8)**: 1971-1980. (doi: 10.1111/trf.12624).
* Noizat-Pirenne F, Tournamille C, Bierling P, Roudot-Thoraval F, Yves Le Pennec P, Rouger P, Ansart-Pirenne H. Relative immunogenicity of Fya and K antigens in a Caucasian population, based on HLA class II restriction analysis. *Transfusion* 2006; **46**: 1328-1333.
* Chiaroni J, Dettori I, Ferrera V, Legrand D, Touinssi M, Mercier P, de Micco P, Reviron D. HLA-DRB1 polymorphism is associated with Kell immunisation. *Brit J Haematol* 2005; **132**: 374-378.
* Reviron D, Dettori I, Ferrera V, Legrand D, Touinssi M, Mercier P, de Micco P, Chiaroni J. HLA-DRB1 alleles and Jka immunization. *Transfusion* 2005; **45**: 956-959.

**Virology**

Discuss the current and future role of point of care testing (POCT) in diagnostic virology services

Critically evaluate the barriers and challenges to elimination of transmission of viral infections for which there are established vaccination programmes and World Health Organisation elimination targets.