

NATIONAL VIROLOGY REFERENCE LABORATORY

Department of Laboratory Services

The National Virology Reference Laboratory provides diagnostic services for the detection and monitoring of viral illnesses and also monitoring the effectiveness of viral vaccines.

The laboratory also acts as a referral laboratory for Disease Control Division, Panaga Hospital and Jerudong Park Medical Centre for viral confirmatory testing.

The laboratory has been designated as one of the WHO Measles and Rubella Network Laboratory in the Western Pacific Region and also recognised as a WHO accredited National Measles and Rubella Laboratory since 2014.

Address

National Virology Reference Laboratory
Biomedical Sciences Research Unit,
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Laboratory Personnel

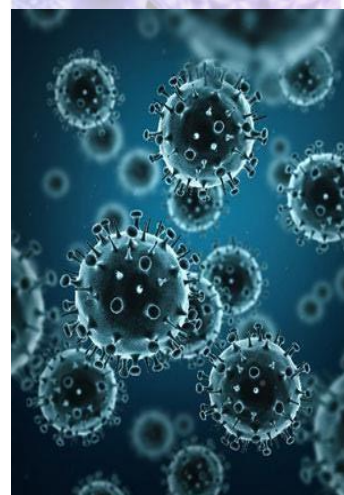
Head of Section: Hjh Mazmah Hj Ahmad Morshidi
Deputy Head of Section: Nur' Amirah Ibarahim

Staff:

- Scientific Officers
- Medical Scientific Officers
- Medical Laboratory Technologist
- Senior Laboratory Technician
- Laboratory Technicians
- Senior Laboratory Assistant
- Laboratory Assistants
- Attendant

Operating Hours

Monday to Thursday and Saturday
7.45am - 12.15pm and 1.30pm - 4:30 pm
On-Call 24 Hours



Antenatal screening panel (HBsAg, Rubella IgG, HIV and Syphilis)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	Screening for HIV 1/2 antibodies, Syphilis, Rubella IgG and Hepatitis B surface antigen

Chikungunya virus IgM antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Daily during office hours
TAT	3 days
Clinical Usage	A positive result suggests current or recent exposure to chikungunya virus

Cytomegalovirus IgG antibody (CMV IgG)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Monday
TAT	7 days
Clinical usage	Positive CMV IgG results indicate past or recent CMV infection.

Cytomegalovirus IgM antibody (CMV IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Monday
TAT	7 days
Clinical Usage	Positive CMV IgM results indicate a recent infection (primary, reactivation or reinfection)

Cytomegalovirus DNA (CMV DNA-viral load)

Specimen	Blood (purple top - 6mL x3)
Transport	Specimen must be transported at 2-25°C and centrifuged within 24 hours of collection
Method	Polymerase chain reaction (PCR)
Performed	In batches of 21 specimens during office hours
TAT	21 days
Clinical Usage	A quantitative result indicates the degree of active CMV viral replication in the patient. Monitoring CMV DNA levels over time is important to assess disease progression and/or monitoring a patient's response to anti-CMV therapy

Dengue virus screening panel (NS1 antigen, IgM & IgG)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Rapid immunoassay test
Performed	Daily during office hours
TAT	1 - 3 days
Clinical Usage	The presence of dengue NS1 antigen is consistent with acute-phase infection with dengue virus. The differential IgG/IgM antibodies are intended for the presumptive diagnosis between primary and secondary dengue infection

Epstein-barr virus capsid antigen IgM (EBV VCA IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	A positive result suggest the presence of acute EBV infection

Epstein-barr virus capsid antigen IgA (EBV VCA IgA)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Wednesday
TAT	14 days
Clinical usage	High levels of IgA class antibody to the VCA supports the clinical diagnosis of nasopharyngeal carcinoma

Epstein-barr virus capsid antigen IgG (EBV VCA IgG)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical usage	A positive result indicates the presence of acute or late EBV infection

Epstein-barr virus early antigen IgA (EBV EA IgA)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Wednesday
TAT	14 days
Clinical usage	Aids in the clinical diagnosis of nasopharyngeal carcinoma

Hepatitis A virus IgM antibody (HAV IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	A positive result indicates acute or recent (<6 months) hepatitis A infection

Hepatitis A Total antibody (Anti-HAV)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	A positive result indicates that the patient had hepatitis A either recently or in the past or immunity to hepatitis A from vaccination

Hepatitis B Core antibody (Anti-HBc)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Thursday
TAT	7 days
Clinical Usage	A positive result indicates acute, chronic, or past/resolved hepatitis B infection

Hepatitis B Core IgM (AHBc IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Thursday
TAT	7 days
Clinical Usage	A positive result indicates recent acute hepatitis B infection

Hepatitis B e antibody (Anti-HBe)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Thursday
TAT	7 days
Clinical Usage	Seroconversion from HBeAg to anti-HBe during acute hepatitis B infection is usually indicative of resolution of infection and a reduced level of infectivity

Hepatitis Be antigen (HBeAg)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Thursday
TAT	7 days
Clinical Usage	Presence of HBeAg and absence of anti-HBe usually indicate HBV replication and high infectivity

Hepatitis B marker panel (HBeAg, Anti-HBc, HBc IgM and Anti-HBe)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Thursday
TAT	7 days
Clinical Usage	Screening for HBeAg, anti-HBc, AHBc IgM and anti-HBe to follow the patient's progress and determine the state of infection

Hepatitis B surface antibody (Anti-HBs)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	A positive result indicates recovery from acute or chronic HBV infection or acquired immunity from HBV vaccination

Hepatitis B Surface Antigen (HBsAg)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	A positive screen result is indicative of acute or chronic HBV infection or chronic HBV carrier state

Hepatitis B virus DNA (HBV DNA-viral load)

Specimen	Blood (purple top - 6mL x 3)
Transport	Specimen must be transported at 2-25°C and centrifuged within 24 hours of collection
Method	Polymerase chain reaction (PCR)
Performed	In batches of 21 specimens during office hours
TAT	14 days
Clinical Usage	A quantitative result indicates the degree of active HBV viral replication in the patient. Monitoring HBV DNA levels over time is important for assessing disease progression or monitoring a patient's response to anti-HBV therapy

Hepatitis C Antibody (Anti-HCV)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	A positive result suggests that the patient has been infected or is currently infected with hepatitis C virus

Hepatitis C virus RNA (HCV RNA-viral load)

Specimen	Blood (purple top - 6mL x3)
Transport	Specimen must be transported at 2-25°C and centrifuged within 24 hours of collection
Method	Polymerase chain reaction (PCR)
Performed	In batches of 21 specimens during office hours
TAT	21 days
Clinical Usage	A quantitative result indicates the degree of active HCV viral replication in the patient. Monitoring HCV RNA levels over time is important to assess disease progression and/or monitoring a patient's response to anti-HCV therapy

Herpes simplex virus IgM antibody (HSV IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Monday
TAT	7 days
Clinical Usage	A positive result (ie, the presence of IgM class HSV 1 and/or 2 antibodies) indicates recent infection. The presence of HSV 1 and/or 2 antibodies may indicate a primary or reactivated infection, but cannot distinguish between them

Herpes simplex virus IgG antibody (HSV IgG)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Monday
TAT	7 days
Clinical Usage	The presence of IgG-class antibodies to HSV types 1 or 2 indicates previous exposure, and does not necessarily indicate that HSV is the causative agent of an acute illness

HIV 1/2 antigen/antibody screening

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	Detection of antibodies to HIV type 1 and/or type 2 which is associated with AIDS

HIV 1/2 antibody confirmatory

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Immunochromatographic test
Performed	Every Monday
TAT	7 days
Clinical Usage	Confirm the presence of antibodies against the human immunodeficiency virus type 1 (HIV-1), including group O and type 2 (HIV-2)

HIV-1 virus RNA (HIV-1 RNA-viral load)

Specimen	Blood (purple top - 6mL x3)
Transport	Specimen must be transported at 2-25°C and centrifuged within 24 hours of collection
Method	Polymerase chain reaction (PCR)
Performed	In batches of 21 specimens during office hours
TAT	21 days
Clinical Usage	This test is intended for use in conjunction with clinical presentation and other laboratory markers of disease progression for the clinical management of HIV-1 infected patients

Influenza A virus PCR

Specimen	Nasopharyngeal and oropharyngeal swab (combined), nasal swab or throat swab (in viral transport media provided by the laboratory) Bronchoalveolar lavage, nasopharyngeal aspirate or sputum (in a sterile screwcapped bottle)
Transport	Specimens should be transported to the laboratory on ice or refrigerant gels packs in a cool box or any form of carrier bag for transport. Refrigerate specimen at 2-8°C after collection if not immediately transported to the laboratory.
Method	Multiplex real-time PCR
Performed	During office hours
TAT	3 days
Clinical Usage	A positive test result indicates that the patient is presumptively infected with influenza A virus

Influenza A virus subtyping (Subtypes H1N1/2009 pandemic, H3, H5 and H7N9)

Specimen	Nasopharyngeal and oropharyngeal swab (combined), nasal swab or throat swab (in viral transport media provided by the laboratory) Bronchoalveolar lavage, nasopharyngeal aspirate or sputum (in a sterile screw-capped bottle)
Transport	Specimens should be transported to the laboratory on ice or refrigerant gels packs in a cool box or any form of carrier bag for transport. Refrigerate specimen at 2-8°C after collection if not immediately transported to the laboratory.
Method	Multiplex real-time PCR
Performed	During office hours
TAT	3 days
Clinical Usage	Influenza A virus molecular subtyping

Influenza B virus PCR

Specimen	Nasopharyngeal and oropharyngeal swab (combined), nasal swab or throat swab (in viral transport media provided by the laboratory) Bronchoalveolar lavage, nasopharyngeal aspirate or sputum (in a sterile screwcapped bottle)
Transport	Specimens should be transported to the laboratory on ice or refrigerant gels packs in a cool box or any form of carrier bag for transport. Refrigerate specimen at 2-8°C after collection if not immediately transported to the laboratory.
Method	Multiplex real-time PCR
Performed	During office hours
TAT	3 days
Clinical Usage	A positive test result indicates that the patient is presumptively infected with influenza B virus

Japanese encephalitis virus IgM antibody (JEV IgM)

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	During office hours
TAT	1-3 days
Clinical Usage	A positive result suggests that the patient is currently infected with JEV

Measles IgG antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	During office hours
TAT	7 days
Clinical Usage	Positive IgG results coupled with a negative IgM result indicate previous exposure to measles virus and immunity to this viral infection

Measles IgM Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	During office hours
TAT	4 days
Clinical Usage	Positive IgM results, with or without positive IgG results, indicate a recent infection with measles virus

Middle East respiratory syndrome coronavirus (MERS-CoV)

Specimen	Lower respiratory tract - sputum, tracheal aspirate, bronchoalveolar lavage Upper respiratory tract - nasopharyngeal and oropharyngeal swab, nasopharyngeal aspirate When collecting nasopharyngeal and oropharyngeal specimens, swabs specifically designed for collecting specimens for virology must be used. These swab kits contain virus transport medium and can be obtained from CSRA RIPAS Hospital or NVRL, Sumbiling. The nasopharyngeal and oropharyngeal swabs should be placed in the same tube to increase the viral load. Sputum samples and aspirates should be collected in a sterile sputum bottle
Transport	Transport of specimen to NVRL must be in a basic triple packaging system and in ice. Primary sample container should be kept in a biohazard zip lock bag. These are then placed in an autoclavable white container provided by NVRL. These packages can then be kept in a cool box or any form of carrier bag for transport
Method	Multiplex real-time PCR
Performed	During office hours and on-call
TAT	1 day
Clinical Usage	Diagnosis of MERS-CoV infection for patients with travel history to affected areas

Monkeypox Virus (MPXV)

Specimen	Lesion swab and throat swab (in viral transport media provided by the laboratory)
Transport	Specimens should be transported to the laboratory on ice or refrigerant gels packs in a cool box or any form of carrier bag for transport. Refrigerate specimen at 2-8°C after collection if not immediately transported to the laboratory.
Method	Multiplex real-time PCR
Performed	During office hours
TAT	3 days
Clinical Usage	A positive test result indicates that the patient is presumptively infected with influenza A virus

Mumps IgG Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	The presence of detectable IgG-class antibodies indicates prior exposure to the mumps virus through infection or immunization. Individuals testing positive are considered immune to mumps virus

Mumps IgM Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	Presence of IgM-class antibodies to mumps virus may support a clinical diagnosis of recent/acute phase infection with this virus

Parvovirus B19 IgG Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	A positive result implies past exposure/infection to parvovirus B19

Parvovirus B19 IgM Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	A positive result implies current or recent parvovirus B19 infection

Respiratory virus panel multiplex PCR (influenza A, influenza B, human coronaviruses NL63, 229E, OC43 and HKU1, parainfluenza 1, 2,3 and 4, human metapneumovirus A and B, rhinovirus, respiratory syncytial viruses A and B, adenovirus, enterovirus, parechovirus, bocavirus and *Mycoplasma pneumoniae*)

Specimen	Nasopharyngeal and oropharyngeal swab (combined), nasal swab or throat swab (in viral transport media provided by the laboratory) Bronchoalveolar lavage, nasopharyngeal aspirate or sputum (in a sterile screw-capped bottle)
Transport	Specimens should be transported to the laboratory on ice or refrigerant gels packs in a cool box or any form of carrier bag for transport. Refrigerate specimen at 2-8°C after collection if not immediately transported to the laboratory.
Method	Multiplex real-time PCR
Performed	During office hours
TAT	3 days
Clinical Usage	Aid in evaluation of infections with influenza A, influenza B, human coronaviruses NL63, 229E, OC43 and HKU1, parainfluenza 1, 2,3 and 4, human metapneumovirus A and B, rhinovirus, respiratory syncytial viruses A and B, adenovirus, enterovirus, parechovirus, bocavirus and <i>Mycoplasma pneumoniae</i> .

Rubella IgG Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	The presence of detectable IgG-class antibodies indicates immunity to the rubella virus through prior immunisation or exposure. Individuals testing positive are considered immune to rubella infection

Rubella IgM Antibody

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	The presence of detectable IgG-class antibodies indicates immunity to the rubella virus through prior immunisation or exposure. Individuals testing positive are considered immune to rubella infection

SARS-CoV-2 RT-PCR

Specimen	Lower respiratory tract - sputum, tracheal aspirate, bronchoalveolar lavage Upper respiratory tract - nasopharyngeal swab, nasopharyngeal aspirate When collecting nasopharyngeal swab, swabs specifically designed for collecting specimens for virology must be used. These swab kits contain virus transport medium and can be obtained from CSRA RIPAS Hospital or NVRL, Sumbiling. Sputum samples and aspirates should be collected in a sterile sputum bottle
Transport	Transport of specimen to NVRL must be in a basic triple packaging system. Primary sample container should be kept in a biohazard zip lock bag. These are then placed in an autoclavable white container provided by NVRL. For surveillance samples, multiple zip lock bags can be placed in a bigger biohazard bag and secured with a cable tie. This package can then be kept in a cool box or any form of carrier bag with ice or refrigerant gels packs for transport.
Method	RT-PCR
Performed	Daily during office and after office hours
TAT	24 hours
Clinical usage	Diagnosis of COVID-19 infection

Syphilis screening

Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Daily during office hours
TAT	2 – 7 days
Clinical Usage	Screening test for syphilis infection

Torch IgM screening panel (CMV, Rubella, HSV and Toxoplasma IgM)	
Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	See individual tests
Performed	Every Monday
TAT	7 days
Clinical Usage	Screening tests for diagnosis of infections by Toxoplasma, Rubella, CMV and HSV

Toxoplasma IgG antibody (Toxo IgG)	
Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Monday
TAT	7 days
Clinical Usage	A positive Toxoplasma IgG result is indicative of current or past infection with Toxoplasma gondii

Toxoplasma IgM antibody (Toxo IgM)	
Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Chemiluminescence immunoassay (CLIA)
Performed	Every Monday
TAT	7 days
Clinical Usage	Active toxoplasmosis is suggested by the presence of IgM antibodies, but elevated anti-IgM titers are often absent in immunocompromised patients. In addition, elevated IgM can persist from an acute infection that may have occurred as long ago as 1 year

Varicella zoster IgG antibody (VZV IgG)	
Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	The presence of detectable IgG-class antibodies indicates prior exposure to the VZV through infection or immunisation. Individuals testing positive are considered immune to varicella-zoster

Varicella zoster IgM antibody (VZV IgM)	
Specimen	Blood (red top, 6mL or SSTII gold top, 3.5-5mL)
Method	Enzyme-linked immunosorbent assay (ELISA)
Performed	Every Saturday
TAT	7 days
Clinical Usage	A positive IgM result indicates a recent infection with VZV

Viral gastroenteritis panel (*Rotavirus*, *Adenovirus*, *Astrovirus* and *Norovirus*)

Specimen	Stool sample in sterile stool container
Method	Immunochromatographic test
Performed	Every Tuesday
TAT	7 days
Clinical Usage	Qualitative detection of <i>Rotavirus</i> , <i>Adenovirus</i> , <i>Astrovirus</i> and <i>Norovirus</i> (genogroups I and II) infection in stool samples