

HIV

General:

HIV (human immunodeficiency virus) has been known since the early 80s to cause AIDS, the Acquired Immune Deficiency Syndrome. HIV belongs to retroviridae. The genetic information is on 2 single-stranded RNAs. As with other retroviruses HIV shows group-specific antigens ("gag", structure proteins), virus enzymes ("pol") and surface proteins ("env"). HIV proteins can block specific lymphocyte receptors. Thus the immunocompetent cells lose their ability to eliminate certain antigens. Simultaneously, by using the reverse transcriptase, the virus reproduces within the cells. Depending on the course of the HIV infection, the stages can be classified as follows: Lymph Adenopathy Syndrome (LAS), Aids Related Complex (ARC) and complete AIDS picture. Transmission occurs through sexual contacts, blood contact, and needle injury.

Laboratory diagnostics and course of HIV infection: CD8-suppressor cell and CD4-helper cell ratio and see HIV-1-RNA-quantitative for therapy monitoring. Neopterin and β 2-microglobulin are often elevated in LAS and AIDS related complex (ARC) and AIDS. These parameters are considered indicators of the cellular immune status.

HIV status:

Parameter	Incubation	Latency	LAS*	ARC #	AIDS+
CD4/ μ l absolute	>400	>400	>400	400-600	<200
CD4/CD8	>1	>1	0.5-1.0	0.5-1.0	<0.5
HIV antigen	pos/neg	pos	pos	pos	pos
neopterin	neg	neg	neg/pos	pos	pos
β 2 –micro-globulin	neg	neg	neg/pos	pos	pos
cofactors			anemia	anemia	anemia
		leukopenia	leukopenia	leukopenia	leukopenia
		thrombopenia	thrombopenia	thrombopenia	thrombopenia
		IgG, IgA rise	IgG, IgA rise	IgG, IgA rise	IgG, IgA rise
*Lymphadenopathy syndrome # ARC: AIDS related complex; + AIDS: opportunistic infections (PCP, TB, candida, coccidioides, cryptosporidia, herpes, CMV, EBV, and others, malignant lymphomas, Kaposi sarcoma)				circul. immune complexes	circul. immune complexes
				oral candidiasis	oral candidiasis
					CMV, EBV, zoster and others

HIV associated infections:

Microorganism	Frequency in AIDS	Clinic	Diagnosis	
<i>Pneumocystis carinii</i>	85%, in every 2 nd patient; first manifestation of the syndrome	<i>Pneumomocystis carinii</i> , pneumonia (PcP)	sputum, bronchial lavage, antibody detection	
<i>Toxoplasma gondii</i>	approx. 30%	Encephalitis	CT, NMR, antibody detection	
<i>Mycobacterium tuberculosis</i>	approx. 10%	Tuberculosis	PCR	
<i>Mycobacterium avium, intracell., atyp. mycob. (MOTT)</i>	in 20% disseminated mycobacteriosis (in every 2 nd patient asympt. intestinal colonization)	in disseminated mycobacteriosis fever, diarrhea, cachexia and others	PCR	
<i>Salmonellae spp.</i>	5-10 %	enteritis or typhoid-like syndrome	culture stool and blood, antibody detection	
<i>Campylobacter spp.</i>		Enteritis	culture, antibody detection	
<i>Cryptosporidiae</i>	frequent	aqueous diarrhea	Stool analysis, antibody detection	
<i>Entamoeba histolytica</i>		Bloody & aqueous diarrhea	Stool analysis, antibody detection	

<i>Candida albicans</i>	<p>1. local candidiasis in almost all AIDS patients</p> <p>2. sometimes systemic candidiasis</p>	<p>1. local candidiasis: white coatings (oral cavity, esophagus and others) ev. Esophagitis</p> <p>2. systemic candidiasis: fever, cough</p>	<p>1. local candidiasis, culture</p> <p>2. systemic candidiasis: antibody detection</p>	
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Microorganism	Frequency in AIDS	Clinic	Diagnosis
<i>Cryptococcus neoformans</i> (yeast in earth and bird dung)	approx. 5%	<p>1. focal pneumonia</p> <p>2. disseminated infection with fever, headache, hepatosplenomegaly, cerebral symptoms</p>	Microscopy: sputum, bronchial lavage, CSF, antigen in serum and CSF
<i>Cytomegaly virus (CMV)</i>	approx. 30%	infections of intestinal tract, retinitis, meningo encephalitis, suprarenalitis, very rare pneumonia	PCR, antibody detection
<i>Herpes simplex virus (HSV)</i>	<p>endogenous reactivation of latent infections: HSV I > 90%</p> <p>HSV II 15%</p>	ulcerated lesions perianal, rectal, genital (HSV II), orofacial and esophageal (HSV I)	PCR, antibody detection
<i>Varicella-Zoster virus</i>	approx. 5% of the patients present with Herpes zoster	Herpes zoster	Antibody detection, PCR
<i>Papovavirus (IC virus)</i>	3%	progressive multi-focal	neurological symptoms, CT and

		leukoencephalopathy	brain NMR
<i>Aspergillus fumigatus</i>		bronchitis, atyp. pneumonia	radiological, antibody detection
<i>Blastocystis hominis</i>		gastrointestinal symptoms	stool test
<i>Giardia lamblia</i>		gastrointestinal symptoms	stool test
<i>Adenovirus</i>		gastrointestinal symptoms	stool test, antibody detection

Microorganism	Frequency in AIDS	Clinic
<i>Isospora belli</i> (coccidiosis)		Diarrhea
<i>Histoplasma capsulatum</i>		atyp. pneumonia
<i>Rochalimea spp.</i>	associated with Kaposi syndrome	vascular skin symptoms, system. organic failure possible

The following tests are available:

- HIV 1/2 antibody + p24 antigen

General:

The occurrence of specific antibodies against HIV differs individually. In general, IgG antibodies are traceable after 3 weeks, latest after 6 months prior to infection. Therefore a negative test does not exclude an infection at the time of measurement. We are offering the 4th generation testing by including the p24 antigen. With this test the diagnostic window is reduced to approx. 7 days.

Indication: Suspicion of immune deficiency syndrome

Material: 1 ml serum

TAT: same day, FML

Method: Combined ECLIA for HIV 1/2 antibodies and p24 antigen

Ref.- range: negative

Note: If the patient is taking multivitamins or dietary supplements containing high dose of Biotin (> 5 mg), the patient should stop taking it for at least 24 hours , before having the blood collection.

• HIV 1/2 Western blot

General:

Confirmation test of a suspicious HIV 1/2-ELISA result.

Material: 1 ml serum

TAT: 2 days, FML

Method: Western blot

Ref.- range: negative, see report

• HIV 1-RNA quantitative

General:

The T-helper (CD4) cell number in combination with quantitative determination of HIV RNA give the best information about the course of HIV infection. A virus concentration of < 10,000 genomes/ml plasma is estimated as good prognosis, > 100,000 genomes/ml plasma points to a rapid progression of the disease.

Indication: Therapy monitoring

Material: 2 ml EDTA blood

Preanalytics: Please note that the PCR test procedure is validated with high sensitivity only for EDTA blood/EDTA plasma. The detected virus load is decreased 10 to 100-fold in clotted serum resulting in a significantly lower sensitivity.

For dispatch please do not freeze EDTA blood and do not send serum! Debris of erythrocytes will disturb the measurement. Alternative material is erythrocyte-free EDTA plasma, which can be dispatched frozen.

TAT: 2 weeks*

Method: PCR

Units: copies/ml

Ref.- range: see report

- **HIV 2-RNA quantitative**

Indication: Therapy monitoring

Material: 3 ml EDTA blood

Preanalytics: Please note that the PCR test procedure is validated with high sensitivity only for EDTA blood/EDTA plasma. The detected virus load is decreased 10 to 100-fold in clotted serum resulting in a significantly lower sensitivity.

For dispatch please do not freeze EDTA blood and do not send serum! Debris of erythrocytes will disturb the measurement. Alternative material is erythrocyte-free EDTA plasma, which can be dispatched frozen.

Please use different tubes for simultaneously requested examinations, as even slight contaminations of the PCR EDTA tube can lead to false positive results.

TAT: 3 weeks*

Method: PCR

Units: copies/ml

Ref.- range: see report

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit <http://www.fml-dubai.com/parameter-listings/>