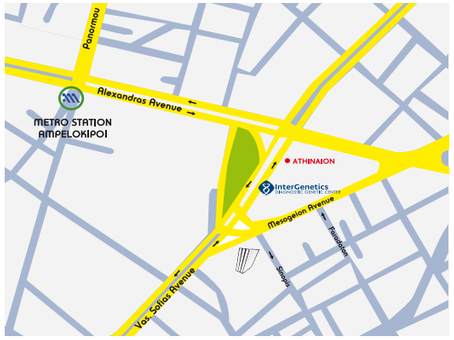

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Molecular detection of varicella virus

The viral disease commonly known as chickenpox is caused by the varicella zoster virus (VZV). It usually affects young children, with relatively mild symptoms, but adults may manifest the disease more severely. Maternal infection with VZV during pregnancy (up to 28 weeks) may cause congenital abnormalities in the fetus, and can also cause premature birth.

The detection of DNA of VZV is performed through a fluorescent PCR reaction, from a serum sample or in amniotic fluid.

Molecular detection of Parvovirus

Parvovirus B19 is the most common group of parvoviruses. If primary infection with the virus occurs during the first five months of pregnancy, the virus may infect the fetus through the placenta and is likely in some cases to cause severe malformations.

The detection of DNA of Parvovirus B19 is performed through a fluorescent PCR reaction, from a serum sample or in amniotic fluid.

Molecular detection of respiratory viruses

Viral infections of the respiratory tract are very common and pose a serious medical problem, as the clinical diagnosis is often difficult, due to the diversity of clinical symptoms which overlap each other.

Early diagnosis can improve the patient's condition and restrict spreading of the infection in a confined space, such as an intensive care unit for newborns.

The tools and techniques utilized in the diagnosis of viral respiratory infections, which are typically based on indirect antibody detection procedures, have been replaced by molecular techniques, which offer many advantages for the detection and diagnosis of more than ten viral respiratory infections in a patient with a single test.

Moreover, many studies have shown that timely detection of viral respiratory infections have reduced significantly the unnecessary use of antibiotics and have reduced substantially the cost of care.

Influenza A, Influenza B, Human respiratory syncytial virus A, Human respiratory syncytial virus B, Human Rhinovirus, Human coronavirus OC43/HKU1, Human coronavirus 229E/NL63, Human adenovirus, Human parainfluenza virus 1, Human parainfluenza virus 2, Human parainfluenza virus 3, Human bocavirus, Human enterovirus.

Also the 5 bacteria: Mycoplasma pneumonia, Haemophilus influenza, Streptococcus pneumonia, Chlamydophila pneumonia and Legionella pneumonophila.

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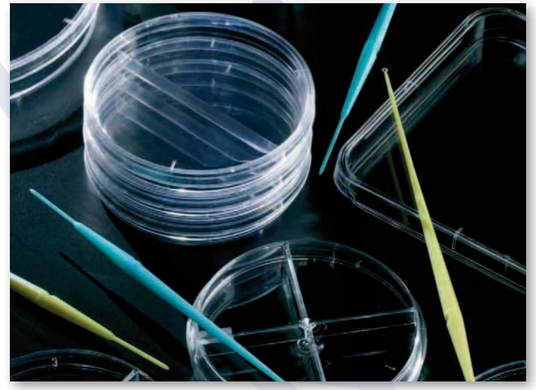
MOLECULAR MICROBIOLOGY



- ✓ *wide spectrum of tests, for the detection of many bacteria and viruses*
- ✓ *comprehensive testing with sensitive techniques*

Molecular detection and typing of HPV

Human Papilloma Virus, (HPV) is a sexually transmitted viral infection and is associated with cervical cancer and other neoplasias. There are more than 60 different types of the virus, which are divided in low-risk (HPV 6, 11, 34, 40, 42, 43, 44, 53, 54, 70 και 74) and high-risk (HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 και 68) groups. Detection is achieved from a cervical smear or a biopsy sample.

Testing is performed utilizing a fluorescent multiplex PCR reaction, which detects the presence of viral DNA and simultaneous genotyping of 25 different HPV subtypes, for accurate risk assessment.

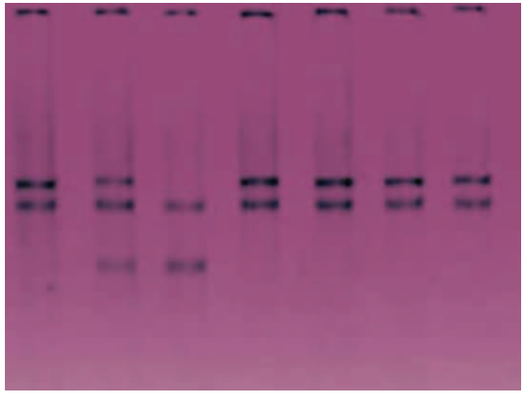
Molecular detection of CMV

Human cytomegalovirus (CMV) is a virus of the family of herpes viruses. These viruses have the common characteristic to remain dormant in the human body for long periods. It is estimated that on average about 2% of pregnant women have undergone primary infection with CMV.

During pregnancy, if a woman is infected for the first time with CMV (primary infection), the fetus is at considerable risk of being affected. It is known that the risk to the fetus is increased when the infection occurs in the first 12-14 weeks of gestation, while if infection occurs during delivery (after birth) there is no substantial risk.

If during the first months of pregnancy a high titer of CMV-IgM antibodies is detected in the serum of the mother, then it is recommended to confirm the suspected primary infection with molecular testing (CMV DNA) in a blood or urine sample of the pregnant woman.

If this test is positive, then molecular prenatal diagnosis of fetal CMV is recommended from an amniotic fluid sample, preferably during the 21st to 23rd week of gestation, because then the virus can



be detected with a higher sensitivity in amniotic fluid, since a period of 6-9 weeks has elapsed from the time of infection of the mother (the fetus secretes the virus mainly through its urine).

Direct detection of the viral DNA of cytomegalovirus (CMV) is performed through a sensitive fluorescent PCR reaction, from a blood or urine sample or from an amniotic fluid sample.

Molecular detection of toxoplasma

Toxoplasma gondii is a parasite and the source of contamination is usually not well cooked meat (especially pork), pets (cats and dogs) and soil contaminated with animal excretions.

If the infection occurs for the first time during pregnancy and the woman has not already developed antibodies, there is a risk (30-40%) of infection of the fetus, which in turn is likely to be affected. In such a case, fetal toxoplasmosis may be treated with special medication.

If active toxoplasmosis is suspected in a pregnant woman between the 10th and 24th week, then molecular prenatal diagnosis may be applied for the detection of the parasite's DNA in a sample of amniotic fluid.

Direct detection of Toxoplasma gondii DNA is performed using a sensitive fluorescent PCR reaction, from an in amniotic fluid sample drawn between 16th and 24th week of gestation.

Molecular detection of mycoplasma/ ureaplasma

Mycoplasma (Mycoplasma hominis) and and ureaplasmaUreaplasma urealyticum) are bacteria often detected in female genitalia and probably transmitted through sexual contact. Infection is thought to be associated with increased risk of spontaneous abortion and preterm birth, but it should be noted that there is considerable controversy regarding this issue.

Although the presence of M. hominis and U. urealyticum may be revealed by culture, the most sensitive method is the simultaneous detection of the DNA of both species through a specific PCR reaction, from a vaginal fluid sample or a tissue sample of an abortion product.

Molecular detection of chlamydia

Chlamydia, mainly those of the genus Chlamydia trachomatis, is the most common sexually transmitted disease and affects more pregnant women than e.g. toxoplasmosis. A recent survey reported that 4-5% of pregnant women are diagnosed with chlamydia infection during their first visit to the obstetrician.

If an infection with chlamydia is not diagnosed and treated properly during pregnancy, the mother can transmit the bacteria to the fetus during labor.

For the detection of the DNA of Chlamydia trachomatis, a specific fluorescent PCR method is applied from a swab, a tissue sample from an abortion product, a urethral or cervical smear but also from a urine sample.

Molecular detection of herpes virus

Viruses of the group of Herpes Simplex Virus (HSV1 & HSV2) cause damage to the central nervous system, encephalitis and also genital lesions (usually HSV2). The most common method of detection is the detection of antibodies; however this has relatively low sensitivity. Differential detection of HSV1 and HSV2 is possible directly from a sample of cerebrospinal fluid, amniotic fluid or a swab.

The detection of DNA of HSV1 and HSV2 is performed through a fluorescent PCR reaction specific for each type.

Molecular detection of Epstein Bar virus

Infections associated Epstein Bar Virus (EBV), which also belongs to the family of herpes viruses, are relatively common, as >95% of the population is infected by the virus during its life. The symptoms are usually mild or may lead to infectious mononucleosis, managed with a suitable treatment.

A fluorescent PCR reaction is performed, which detects the presence of viral DNA, usually from serum sample.