

We have the instruments and technical know-how to provide the following services:

**1. Core Facility for Biosafety is developing and supporting national biosafety and biosecurity by providing help and cooperation in emergency situations such as controlling and solving pandemic situations**

To find faster solutions for emergency situations in Core Facility for Biosafety, UT Institute of Technology we offer:

- Use of 3rd hazard class laboratory rooms with special equipment (ABSL3- Animal BioSafety Laboratory)
- Help from trained scientists and specialists
- Cooperation 24/7

**2. Core Facility of Biosafety has technical competence and equipment to offer services such as:**

**2.1 Use of equipment**

- Automated Cell Counter
- LightCycler 480II
- Li-Cor Odyssey
- KingFisher™ Flex Purification System
- Ion S5 XL Semiconductor Sequencer
- EVOS™ M7000 Imaging System
- Clariostar PLUS
- Dispenser Integra Viaflo 96
- Tecniplast ISOcageN IVC cage shelves
- Type 2 Biological safety cabinet
- Type 3 Biological safety cabinet

**2.2 Research and/or servicework**

**2.2.1 Making and growing tissueculture cell lines from mammal tissues**

- Making stabile and inducing mammal tissueculture cell lines for gene expression.
- Growing and reproducing tissueculture cells.

**2.2.2 Infection in tissueculture model, where eucaryotic tissueculture cells are transfected with viral RNA or cDNA or are infected with natural and/or recombinant viruses**

- Making of Virus-Like particles (based on retroviruses gag-proteinVLP-s)
- Making of viruses - we have resources for making recombinant lentiviruses, adenoviruses SFV (*Semliki Forest Virus*) and AAV (*Adeno-associated Virus*).
- Tissue culture cell transfection with viral RNA or cDNA (so-called releasing virus), collecting viral stock
- Extracting virus from natural and medical material such as arthropods (ticks), nose spin samples, blood sampeles etc
- Reproducing, concentrating and preserving of virus stocks.
- Observing and/or effecting infection rate with potentially antiviral substances or with siRNAs and CRISPR-Cas9 systems.
- Drug screening
- Testing and developing vaccine candidates
- Determination of virus abundance by TCID50, sluce abundance, RT-qPCR or other methods
- Monitoring infectiong in real-time with plate reader and/or automated microscope
- Virus neutralisation tests:
  - End-Point Neutralisation Test
  - Focus Reduction Neutralisation Test
- Preanalytics of non-infectious samples (fixed cells, extracted DNA and RNA, proteins etc) for further analytical steps
  - Microscoping material containing inactivated pathogens (fixed samples)
  - Extracting and preparing material sontaining inactivated pathogens for further analytical steps
  - Quantification of DNA and RNA from inactivated material with real-time PCR
  - Analyzing inactivated samples with PCR method
  - Quantification of proteins in inactivated material using WB (*Western blot*) or Li-Cor Odyssey
  - Analyzing inactivated samples with ELISA (*Enzyme-linked Immunosorbent Assay*) method
  - Analyzing inactivated material with flow cytometer

### **2.2.3 Infection in animal model where mice or rats are infected with natural or recombinant viruses.**

- Infecting laboratory animals with infectious material (intranasal, intravenous, intraperitoneal or intracerebral injection);
- Monitoring virus-infection – keeping laboratory animals in IVC cages, monitoring test animals (visual obsevation, checking their weight etc);
- Executing laboratory animals and collecting infected tissuesamples and/or organs (blood, liver, brain, spleen etc)
- Processing samples and making preparations for further analytical steps (isolation of RNA, synthesis of cDNA, preparation of cell lysates etc) .

#### **2.2.4 Infection in tissue culture model where eucaryotic tissue culture cells are infected with pathogenic microbes (hazard class 2)**

- Growing microbes
- Infecting tissue culture cells
- Monitoring infection rate and/or treatment with antibiotics/antiviral substance
- Determining abundance of microbes
- Preanalytics of non-infectious samples (fixed cells, extracted DNA and RNA, proteins etc) for further analytical steps

#### **2.2.5 Infection in animal model where mice and rats are infected with pathogenic microbes with purpose to investigate effect of treatment (antimicrobial or antiviral substances) in infection model and/or to investigate pathogenetic process caused by virus/microbe**

- Growing microbes
- Preparation of laboratory animals to start infection (for example placing catheter to generate uroinfection)
- Infection of laboratory animals
- Monitoring infection rate and/or treatment with antibiotics/antiviral substances
- Executing laboratory animals and removing/collecting organs/tissues
- Preanalytics of non-infectious samples (fixed cells, extracted DNA and RNA, proteins etc) for further analytical steps.

#### **2.2.6 Work in general laboratory with non-infectious materials**

- Cleaning and preparing material containing inactivated pathogens for further analytical steps
- Quantification of DNA and RNA from inactivated material using real-time PCR
- Analyzing inactivated samples with PCR method
- Quantification of proteins in inactivated material using WB (*Western blot*)
- Analyzing inactivated samples with ELISA (*Enzyme-linked Immunosorbent Assay*) method
- Analyzing inactivated material with flow cytometer

### **2.3 Other services**

- Testing antiviral and antibacterial properties of coatings, textiles, filters etc
- Testing antiviral and antibacterial properties of disinfectants and other solutions
- Testing antiviral and antibacterial properties of disinfection equipment

Laboratory has licence from Healt Board to use infectious materials such as:

- Severe Acute Respiratory Syndrome causing virus (SARS-CoV)

- Severe Acute Respiratory Syndrome causing coronavirus 2 (SARS-CoV-2)
- Middle-East Respiratory Syndrome causing coronavirus (MERS-CoV)
- Genotypes 1-4 of Dengue virus (DENV1-DENV4)
- Yellow Fever Virus (YFV) including Yellow Fever Virus vaccine strain (YFV-17D)
- Western-Nile Fever Virus (WNV) including Kunjin Virus (KUNV)
- Mayaro Virus (MAYV)
- Eastern Equine Encephalitis virus (EEEV)
- Rift Valley Fever flebovirus (RVFV)
- 3rd hazard class A-influenza strains:
  - High pathogenicity bird flue viruses HPAIV (H5), for example H5N1;
  - High pathogenicity bird flue viruses HPAIV (H7), for example H7N7, H7N9
  - A-influenzavirus/New York/1/18 (H1N1) (Spanish flu 1918);
  - A-influenzavirus/Singapur/1/57 (H2N2);
  - Low pathogenicity bird flue viruses (LPAI) H7N9)
- Chikungunya virus (CHIKV).
- C-hepatitis virus (HCV)
- Tick-borne encephalitis virus (TBEV)
- Human immunodeficiency virus type 1 (HIV)

**Price List:**

The price list is mostly project-based, where a project plan and a price offer are prepared for each specific project.

Standard test prices are fixed:

Test	Price for University of Tartu	Price for private companies
End-Point Neutralisation Test	102 €	123 €
Focus Reduction Neutralisation Test	102 €	123 €
Virus Isolation Test from sample	147 €	176 €
Testing antiviral and antibacterial properties of:		
-coatings, textiles, filters etc	1200 €	1800 €
-desinfectants and other solutions	1200 €	1800 €
-desinfection equipment	1200 €	1800 €

VAT will be added to the prices