Our Services

NIB provides custom problem solving projects and routine services listed in this brochure. Highly skilled scientific and professional staff have up-to-date and advanced research instrumentation and facilities at their disposal.

The institute holds ISO 9001 certificate for management. Some analytical laboratories of NIB are also operating in compliance with the **ISO/IEC 17025 standard.**

NIB is government authorized state Laboratory for Plant Health and National Reference Laboratory for GMOs. NIB is nominated state representatives in European Plant Protection Organisation (EPPO) and European Network of GMO Laboratories (ENGL).

NIB holds government authorized license for implementation of biological monitoring of waters including the marine environment (hydrological monitoring of the sea by oceanographic buoy Vida and HF radar, assessment of ecological status of coastal sea according to Water Directive and Marine Strategy, monitoring of marine toxic algae).

Since 2015 **mutagenicity testing** is performed in compliance with Good Laboratory Practices (GLP) according to the OECD guidelines.

References on Collaboration with Industrial Sector and Certificates

- **Lek – Sandoz-Novartis, Slovenia:** Support in development of drugs and cell lines using systems biology approach, quality control and genotoxicity testing. Support in development of 3D spheroid human cell lines for immunotherapy of cancer.
- **De Ceuster Meststoffen, Belgium:** Bioagent characterization, virus purification and quantification, cytotoxicity testing.
- **BIA Separations, Slovenia:** New approaches for concentration, separation and quantification, gene therapy viruses, vaccines and bacteriophages. Virus sample enrichment prior to NGS and electron microscopy.
- **Norwegian Veterinary Institute - National reference laboratory, Norway:** GMO analysis of food and feed samples.
- **Cinkarna Celje, Slovenia:** Biological monitoring of waste waters.
- **Radenska, Slovenia:** Genotoxicity testing of natural and mineral bottled waters.
- The Department of Biotechnology and Systems Biology is accredited according to the ISO/IEC 17025 standard by the Slovenian Accreditation, Reg. No. LP-028 **for detection of GMOs and microorganisms – plant pathogens.**
- NIB is the holder of **National Standard** in the Field of Amount of Substance/Bioanalysis of Nucleic Acids/GMOs and Microorganisms.
- The Department of Genetic Toxicology and Cancer Biology is accredited for **performing the mutagenicity studies** in compliance with OECD Principles of Good Laboratory Practice (GLP).
- **Bacterial Reverse Mutation Assay or Ames Assay** (OECD 471) is performed in the compliance with the principles of Good Laboratory Practice (GLP).

Services in Agricultural Industry

- Detection of Genetically Modified Organisms (GMOs): plants, food, feed, seeds.
- Detection of Microorganisms – plant pathogens: viruses, viroids, bacteria, phytoplasmas.
- Toxicology studies for agrochemicals and biocides.
- In vitro genotoxicty testing of agrochemicals and biocides (Ames test, micronucleous assay, Comet assay, γ-H2AX assay).
- Ecotoxicity studies and aquatic and terrestrial organisms biomonitoring.
- Quality of surface water and aquatic sediments related to organic pollution due to agricultural activities.
- Recombinant protein expression in plants.
- Activity assessment of antimicrobial substances.
- Determination of microbial community composition using molecular techniques in different samples.

Training and Advisory Services

- Analysis of GMOs and plant pathogens: hands on training, workshops, consulting and technical auditing, organization of inter-laboratory testing.
- Development of protocols and workflows compliant with ISO/IEC 17025 and ISO 9001.
- Organization of workshops on quantitative molecular and systems biology.

Services in Pharmaceutical, Food and Biotechnology Industry

- Systems biology studies of production cell lines (characterization, biomarkers identification, production process optimization, production risk reduction).
- Nucleic acid detection and quantification, residual DNA detection.
- Molecular detection, quantification and electron microscopy imaging of target microorganisms and biomolecules.
- Concentration and purification of viruses, phages and VLPs.
- Quantification of viruses for gene therapy/vaccines, bacteriophages in product development.
- Cell based assays for viability and toxicity evaluation.
- Complex multicellular spehoroid assays for drug testing, including apoptosis, senescence, migration/invasion assays.
- In vitro genotoxicity testing (Ames test, SOS/umuC assay, micronucelus assay, Comet assay, γ-H2AX assay).
- In vitro toxicity studies (cytotoxicity, apoptosis, mitochondrial activity, oxidative stress, cell cycle analysis, toxicological gene regulation).
- Biocompatibility assessment of medical devices.
- Evaluation of micronuclei formation and DNA damage in blood and exfoliated epithelial cells (clinical studies, human biomonitoring).

Environmental Monitoring and Water Services

- Validation of waste water treatment plants (WWTP) efficiency (measuring BOD, COD, microbial activity and community analysis, toxicity and genotoxicity of WTP effluents).
- Validation of water purification methods (inactivation and removal, filters efficiency, toxicology and microbiology, including viruses).
- Waterborne viruses concentration, detection and electron microscopy imaging.
- Water and sediment analyses (physiochemical parameters, cyanotoxins, biological analyses of: viruses, phyto- and zoobenthos, phyto- and zooplankton).
- A ecotoxicology testing on algae, cyanobacteria and zebrafish embryo).
- Assessment of the ecological and environmental status of marine and fresh waters following EU legislation (Water Directive WFD 2000/60/EC, Marine Strategy MSFD 2008/56/EC).
- Cytotoxicity and genotoxicity testing of un-concentrated and concentrated water samples (Ames assay, SOS/umuC assay, Comet assay, micronucleus assay).
- Scientific diving (diving base and skilled diving team with underwater camera systems for video and photo recording, survey of marine surface by drone).
- Consulting investors in the developmental planning within protected areas.
- Consulting and designing of nature conservation plans for selected terrestrial and freshwater animal groups.
- Environmental fate studies.

Kdo smo? Who we are?

NACIONALNI INŠTITUT ZA BIOLOGIJO
NATIONAL INSTITUTE OF BIOLOGY

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services