LIFE SCIENCES

Immunology and Cell Biology

Vilnius University

Keywords: *monoclonal antibodies, recombinant antibodies, immunodiagnostics, immunogenicity studies, epitope mapping, virus-like particles*

Research group activities

Focusing on the development and characterization of monoclonal and recombinant antibodies, immunogenicity studies of recombinant virus-like particles, antibody engineering and immunodiagnostics, our research team has generated and characterized over 500 monoclonal antibodies against different targets – viral antigens, bacterial virulence factors, cellular proteins, cytokines, hormones, chemical compounds. The largest antibody collection is generated against viral antigens. Virus-specific antibodies are valuable tools both in basic research and immunodiagnostics of viral infections.

For antibody development, we combine different protein engineering approaches based on the use of virus-like particles.

Main approaches

- Use of virus-like particles as a carrier for target epitopes to increase their immunogenicity. This provides possibilities to generate antibodies against short and non-immunogenic protein sequences.
- Use or virus-like particles as a carrier for antibody molecules. This provides a novel platform for recombinant multimeric antibodies.

Our research group has a wide network of international collaboration and long-lasting experience in conducting collaborative projects with industrial partners.

Collaborations with:

- Industry: Thermo Fisher Scientific Baltic, Abcam Ltd (UK), Santa Cruz Biotechnology (USA), ArcDia (Finland) and others.
- Academic institutions: Friedrich-Loeffler-Institute (Germany), Giessen University (Germany), Australian Animal Health Laboratory (Australia), Health Protection Agency (UK).

Proposal

Our team is experienced in production and characterization of monoclonal and recombinant antibodies, their application in immunodiagnostics and we seek partnership in new joint projects and collaboration with industrial and academic partners.

Meet our team

Head: Prof. Aurelija Žvirblienė

Team members: senior scientists Dr. Indrė Kučinskaitė-Kodzė, Dr. Milda Plečkaitytė, junior scientists Aušra Vaitiekaitė, Indrė Dalgėdienė, PhD students Vaida Simanavičienė, Dovilė Stravinskienė, Milda Zilnytė, Vilija Rubinaitė, Martynas Simanavičius, Asta Lučiūnaitė.

Research outcomes

- A large collection of virus-specific monoclonal antibodies including those specific to hantaviruses, polyomaviruses, henipaviruses, mumps, measles viruses, metapneumovirus, hepatitis B and hepatitis E viruses, human parainfluenza viruses (hPIV3, hPIV2 and hPIV4), bocaviruses (hBoV1-4) and others.
- Serologic assays and kits for immunodiagnostics of viral infections (mumps, measles, hantaviruses, bocaviruses) developed in collaboration with industrial partners.

Most important publications

- Kailasan et al. Mapping antigenic epitopes on the human bocavirus capsid. J Virol. 2016, 90(9): 4670-4680, doi: 10.1128/JVI.02998-15.
- Kucinskaite-Kodze et al. New broadly reactive neutralizing antibodies against hepatitis B virus surface antigen. Virus Res. 2016, 211, 209-221.
- Pleckaityte et al. Construction of polyomavirus-derived pseudotype virus-like particles displaying a functionally active neutralizing antibody against hepatitis B virus surface antigen. BMC Biotechnology. 2015, 15(1): 85.
- Gedvilaite et al. Evaluation of trichodysplasia spinulosa-associated polyomavirus capsid protein as a new carrier for construction of chimeric virus-like particles harboring foreign epitopes. Viruses. 2015, 7(8): 4204-4229.

Patents and patent applications

- Process for the production of monoclonal antibodies using chimeric VLPs. US 7,919,314; 05-04-2011.
- Monoclonal antibodies against vaginolysin. PCT/LT2009/000005, EP2398823 (B1); 23-03-2016.
- Recombinant single-chain antibody fragment neutralizing the cytolytic activity of vaginolysin; PCT/LT2011/000004.

Projects

- Global grant „Novel chimeric proteins with antiviral activity“, VP1-3.1-ŠMM-07-K-02-039 (2012-2015).
- High technology development program, grant „Development of new tools for improved laboratory diagnosis of human papillomavirus (HPV) infection and HPV-related cancer”, AUT-16 (2009-2011).

Contacts

Prof. Aurelija Žvirblienė
Life Sciences Center

E-mail: aurelija.zvirbliene@bti.vu.lt
Phone: +370 5 223 4360

More about the center: http://gmc.vu.lt/en

Department for Research and Innovation

Phone: +370 5 268 7006
E-mail: innovations@mid.vu.lt

More information: http://www.innovations.vu.lt