

Vilniaus universitetas  
Medicinos fakultetas

▲

▼

**STUDENTŲ  
MOKSLINĖS VEIKLOS  
LXXV  
KONFERENCIJA**

▲

▲

Vilnius, 2023 m. gegužės 15–19 d.  
**PRANEŠIMŲ TEZĖS**

*Leidinį sudarė VU MF Mokslo specialistė  
dr. Simona KILDIENĖ*

#### Mokslo komitetas:

Prof. dr. (HP) Janina Tutkuvienė  
Doc. dr. Agnė Kirkliauskienė  
Prof. dr. Vaiva Hendrixson  
Doc. dr. Jurgita Stasiūnienė  
Prof. dr. Nomedas Rima Valevičienė  
Prof. dr. Eglė Preikšaitienė  
Dr. Diana Bužinskienė  
Prof. dr. (HP) Saulius Vosylius  
Doc. dr. Saulius Galgauskas  
Prof. dr. Eugenijus Lesinskas  
Doc. dr. Valdemaras Jotautas  
Prof. habil. dr. (HP) Gintautas Brimas

Dr. Ieva Stundienė  
Prof. dr. Marius Miglinas  
Doc. dr. Birutė Zablockienė  
Inga Kisielienė  
Prof. dr. Violeta Kvedarienė  
Dr. Žymantas Jagelavičius  
Prof. dr. (HP) Edvardas Danila  
Doc. dr. Kristina Ryliškienė  
Dr. Gunaras Terbetas  
Prof. dr. Alvydas Navickas  
Doc. dr. Rima Viliūnienė  
Prof. dr. Sigita Lesinskienė

Doc. dr. Sigitas Ryliškis  
Doc. dr. Vytautas Tutkus  
Dr. Danutė Povilėnaitė  
Doc. dr. Sigita Burokienė  
Dr. Agnė Abraitienė  
Prof. dr. Pranas Šerpytis  
Prof. dr. Robertas Stasys Samalavičius  
Prof. dr. Vilma Brukienė  
Dr. Agnė Jakavonytė-Akstinienė  
Doc. dr. Marija Jakubauskienė

#### Organizacinis komitetas:

Martyna Sveikataitė  
Rafal Sinkevič  
Gintarė Zarembaitė  
Alicija Krasavceva  
Karina Mickevičiūtė  
Jogailė Gudaitė  
Emilis Gegeckas  
Auksė Ramaškevičiūtė  
Tautvydas Petkus  
Kristina Marcinkevičiūtė  
Melita Virpšaitė

Gabrielė Lissauskaitė  
Rosita Reivytytė  
Kamilė Čeponytė  
Šarūnas Raudonis  
Monika Rimdeikaitė  
Inga Česnavičiūtė  
Tadas Abartis  
Rūta Bleifertaitė  
Kristijonas Puteikis  
Saulius Ročka  
Paulius Montvila

Agnė Timofejevaitė  
Augustė Lapinskaitė  
Emilis Šostak  
Gratas Šepetyš  
Gediminas Gumbis  
Erika Ališauskienė  
Indrė Urbaitė  
Miglė Vilniškytė  
Urtė Smailytė  
Gabriela Šimkonytė  
Julija Bitautaitė

ISSN 2783-7831 (skaitmeninis PDF)

© Tezių autoriai, 2023

© Vilniaus universitetas, 2023

## PREVALENCE OF THE PANTON-VALENTIN LEUKOCIDIN GENE AMONG CLINICAL STRAINS OF *STAPHYLOCOCCUS AUREUS*

**Author.** Lilian Jenny Babette SCHNEIDER (III year, Medicine).

**Supervisors.** Assoc. prof. Agnė KIRKLIAUSKIENĖ, lect. Lina KAPLERIENĖ, Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University; Jonas KRIŠČIŪNAS, Faculty of Medicine, Vilnius University.

**Background.** *Staphylococcus aureus* (*S. aureus*) infections are common and play a serious and important role in hospital-acquired infections. Strains of *S. aureus* with the Pantan-Valentin Leukocidin Toxin (PVL) acquired higher virulence. PVL synthesis coding gene consists of *lukS-PV* and *lukF-PV* genes. The PVL generates the creation of pores in the membrane of cells like macrophages, monocytes, and neutrophils. Strains of *S. aureus*, which produce PVL, cause recurrent skin and soft tissue infections, necrotizing pneumonia, and some cases of sepsis.

**The aim of the study.** To determine the prevalence of PVL gene of *Staphylococcus aureus* in strains isolated from hospitalized patients in Vilnius.

**Materials and methods.** Clinical *S. aureus* strains were collected from 2018 to 2019. All *S. aureus* strains were stored frozen at -70°C in the Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University. The frozen strains were refreshed with Brain-Heart Agar to prepare them for the next steps. To extract the *S. aureus* DNA of the refreshed strains, distilled water and a colony from the inoculated Brain-Heart Agar were combined, heated, and centrifuged. Afterward, the extracted DNA was stored at -20°C in the Microbiology department. For detection of *lukF-PV* gene, pools of *S. aureus* lysate DNA were created. If one pool was detected positive for *lukF-PV* gene, every strain of the pool was analyzed individually. *S. aureus* strains were analyzed to detect the *lukF-PV* gene using the designed multiplex real-time polymerase chain reaction (rtPCR) protocol. As the initial rtPCR control, 16S rRNA coding sequence was applied as the DNA target. The primer and probe sequences were designed using Vector NTI Advance™ program for sequence alignment and FastPCR online Java applied for primer tests. On a total volume of 15 µl, using 1 µl *S. aureus* lysate DNA, the reactions were performed. The composition of the real-time multiplex PCR mixture was as followed: 7,5 µl 2x SensiMix™ II Probe, 200 nM concentration of each primer, and 100 nM concentration of each hydrolyzed probe. A Rotor-Gene Q 5plex HRM thermal cycler was used to perform the reactions under the following conditions: initial denaturation at 95°C for 10 minutes for one cycle, the following 40 cycles of denaturation at 95°C for 20 seconds, and primer annealing and extension at 55°C

for one minute. The detection primers and hydrolysis probes of *lukF-PV* used were as followed: Pvl\_F TGGTTGGGATGTTGAAGCACA; Pvl\_R TTGCAGCGTTTTGTTTCGAG; Pvl\_P HEX/TGCCAGTGTTATCCAGAGGTA ACT/BHQ1.

**Results.** A total of 615 *Staphylococcus aureus* strains were tested for the PVL gene. 15.6% (n = 96) were isolated from blood, 13.8% (n = 85) from the respiratory tract, 65.7% (n = 404) from skin and soft tissues, 3.1% (n = 19) from urine, 1.8% (n = 11) from other specimens. Out of total isolated strains, 7.5% strains (n = 46) were PVL positive and 30.4% strains (n = 14) of PVL positive *S. aureus* were methicillin-resistant *S. aureus* (MRSA). 71,7% (n = 33) of the PVL positive *S. aureus* were isolated from skin and soft tissues, 10.9% (n = 5) from the respiratory tract, 13.0% (n = 6) from blood, 2.2% (n = 1) from urine, and 2.2% (n = 1) from other specimens.

**Conclusion.** 7.5% of the tested *Staphylococcus aureus* strains were PVL positive. PVL positive *S. aureus* was mostly found in skin and soft tissue specimens. 30.4% of PVL positive *S. aureus* were MRSA strains.

**Keywords.** Panton-Valentin Leukocidin; *Staphylococcus aureus*.