

*Staphylococcus* has great adaptive properties and is widely disseminated in the environment. Some of them live on skin and mucous membranes of animals and people constituting natural microflora of an organism. Infections caused by staphylococci are a serious problem both to people and animals. Particularly dangerous strains are isolated in hospitals where they may be responsible for conditions threatening life (sepsis syndrome). Data available in literature indicates that in domestic animals a growing number of cases of infection with staphylococci confirmed by a laboratory test, and in particular infections with *Staphylococcus aureus* is observed. Determination of a role which animals may play in disseminating these pathogens is very important as also in animals being a carrier of staphylococci may be related to presence of methicilline-resistant strains and multi-drug resistance strains.

The view that domestic animals represent a reservoir of pathogens dangerous to humans is not new. The first confirmed isolation of *Staphylococcus aureus* from dogs and cats was carried out over fifty years ago. Since then a possibility of transmission of staphylococci among people and domestic animals and a role of cats and dogs as a potential reservoir of these pathogens has been emphasized.

At present dogs and cats are kept at home and they have closer and more frequent contact with owners. Change of the living conditions probably affects composition of physiological bacterial flora of these animals. From the report of TNS Polska of 2014, it results that almost 48% of Poles have accompanying animals in their households. In almost every 4th Polish household a cat is kept. Therefore the purpose of the project is a characteristics of the bacteria of the genus *Staphylococcus* in pet cats. The main purpose of the research will be determination of species differentiation of the bacteria of the genus *Staphylococcus*, isolated from skin and mucous membranes of clinically healthy cats and cats with symptoms of bacterial infection of conjunctiva, upper respiratory tract, skin and injuries. The above mentioned bacterial infections are frequent causes of visits at veterinary clinics. The observation research of two groups of animals will enable also an analysis of relations between a clinical condition of an animal and specific species of staphylococci, which will direct further laboratory tests. The purpose of the second stage of the research will be characteristics of antibiotic resistance, virulence and genotypes of selected strains of staphylococci. The research will be based on an analysis of genotype and phenotype properties of antibiotics resistance of the bacteria which will facilitate not only proving genetic potential of resistance, but also observation of these properties in *in vitro*. As proved by initial research *Staphylococcus* is a carrier of many genetic determinants of resistance, which however is not closely correlated with occurrence of resistance in the standard antibiogram.

The species identification of staphylococci will be performed with use of the mass spectrometry method so called MALDI-TOF MS. It is an instrument used in clinical microbiology for quick and precise identification of microorganisms. The marking of antibiotic resistance will be made at the phenotype and genotype level with use of disk diffusion method and MIC (Minimal Inhibitory Concentration) according to the recommendations of CLSI M100-S25 and by identification of selected genetic determinants of resistance (*blaZ*, *ermA/B/C*, *tet(K)/(L)/(M)/(O)*, *vanA/B*, *mecA/C*, *mupA*, *aac(6')Ie-aph(2'')Ia*, *fusB/C/D*) using PCR technique (polymerase chain reaction). Additionally, virulence factors will be marked, such as: ability to produce coagulase and biofilm, presence of ACME element and gens of toxins: enterotoxins SEA-SEE, leukocidin PLV, exfoliatine and cytotoxin.

At present in Poland no routine research is performed on multi-drug resistance in staphylococci isolated from companion animals. These pathogens represent a growing threat to a public health and bring many therapeutic difficulties both in people and in animals. Identification and epidemiological characteristics of all potential sources of these pathogens is a challenge to a human medicine and veterinary medicine. *Staphylococcus* is a perfect example of pathogens which demand „one health” approach that is interdisciplinary co-operation of doctors of human and veterinary medicine and many scientists from other related areas in order to protect health of people, animals and environment.