halogen in the aromatic ring in the position of 3-pyrazol was found to intensify antimicrobial activity considerably (250-500 mcg/ml) concerning *Staphylococcus aureus* and *Escherichia coli*. The best antimicrobial activity (250 mcg/ml) of all the examined bacteria and fungi was demonstrated by the compound 3-[(3-(4-chlorophenyl)-1-phenyl-1*H*-pyrazol-4-il-benzo[b]quinolin-1-carbonic acid.

It should be noted that introduction of a hetarylic fragment into the molecular structure of the acids examined in the position of 3-pyrazol nucleus do not result in an expected intensification of antimicrobial activity.

Detected antimicrobial activity of new derivatives of 2-(1-phenyl-3-aryl-1*H*-pyrazol-4-il)benzo[b]quinolin-4-carbonic acid enables to recommend further search of antimicrobial means among the derivatives of quinolin-4-carbonic acid including goal-directed synthesis of new substances with predicted antimicrobial properties and wider spectrum of the examined strains of pathogenic and opportunistic microorganisms.

Popovych V.B.

TAXONOMY CONTENT AND POPULATION LEVEL OF RESIDENTIAL MICROBIOTA OF LARGE INTESTINE CONTENT IN PRACTICALLY HEALTHY PEOPLE WITH LACTOBACTERIAL TYPE

Department of Microbiology and Virology
Higher State Educational Establishment of Ukraine
"Bukovinian State Medical University"

Obligate microflora is the main, residential or indigenous microflora that consists of lacto bacteria, bifidobacteria, propionic bacteria, bacteroides that constitute approximately 90 % of the total amount of microorganisms. Optional microbiota – saprophytic and opportunistic ones – is represented by enterobacteria, peptogenic bacteria, Streptococci etc. They constitute 10 % of the total amount of microorganisms. The remaining one, including transitory microbiota, is represented by random microorganisms (citrobacter, enterobacter, yeast, clostridia, aerobic bacilli and others). It comprises only 1 % of the total amount of microorganisms but has its own peculiarities that require special investigation.

For specification of the generic content, population level of microorganisms that inhabit certain biotopes of the large intestine in practically healthy people, bacteriologic and mycological investigations are conducted. In this way, taxonomy content and population level of the large intestine microbiota in practically healthy people are studied.

In practically healthy people who were prior identified to have lacto bacterial type of the large intestine microbiota, taxonomic content is manifested by representatives of main, additional and random microflora that belongs to nine various taxonomic groups. The main residential microbiota of the large intestine in practically healthy people with lacto bacteria microbiota type is represented by obligate anaerobic bacteria of *Lactobacillus*, *Bifidobacterium, Bacteroides* and *Escherichia* genera that are identified in all (23) practically healthy people with lactobacteria microbiota type. These bacteria possess a high analytical index in the large intestine microbiota. Constancy index of this matter constitutes 100%, frequency of occurrence is 0,5 equivalent units (e.u.), Margalef's generic abundance index – 95,65, Whittaker's generic variety index – 3,25 e.u., Simpson and Berger-Parker's generic domination index – 0,27 and 1,00 respectively. The characteristic microbiota of this category of people is that bacteria of *Peptostreptococcus, Proteus* genera as well as yeast-like fungi of *Candida* genus are constant representatives of associate the large intestine microbiota. The latter are characterized by high (52,19 %) constancy index, frequency of occurrence is 0,08 e.u., Margalef's generic abundance index – 47,83 e.u., Whittaker's variety index – 1,70 e.u. The last two indices prove that apart from other types, optimal conditions for yeast-like fungi of *Candida* genus are created in the large intestine of practically healthy people with lactobacteria microbiota type: spatial-nutritional resources and environmental conditions for these microorganisms existence in the given biotope. This should be taken into account during the investigation of pathogenesis of intestinal infections and choice of therapeutic measures in practically healthy people with lacto bacteria microbiota type of the large intestine.

The study of population level of the main, additional and random microbiota of the large intestine content in practically healthy people with lactobacteria microbiota type suggested that lactobacteria possess the highest population level (8,78±0,11 lg CFU/g). *Bifidobacteria* appeared to have 26,15 % lower population level. It is also lower in bacteria of *Bacteroides*, *Peptostreptococcus* genera, as well as in 2,57 times lower in bacteria of *Proteus* genus, *Staphylococcus* – 72,50 %, yeast-like fungi of *Candida* genus – by 80,66 %. Bacteria of *Klebsiella* and *Enterococcus* genera are not detected in the large intestine content.

Popovych V.B., Sydorchuk I.Y., Koval G.M.*, Yakovychuk N.D.

MICROSCOPY CHARACTERISTIC OF THE LARGE INTESTINE MICROBIOTA IN PRACTICALLY HEALTHY PEOPLE WITH BACTEROID TYPE

Department of Microbiology and Virology
Higher State Education Establishment *of Ukraine*
"Bukovinian State Medical University"
Department of Microbiology, Virology and Immunology
*with the course of Infectious Diseases**
«Uzhgorod National University»

Neutral microflora of the intestinal tract is necessary and useful for the human body vital activity and presents rather complicated ecological system that finds itself in balance with a host body. Annually, the amount of information in scientific sources increases and that confirms that exactly microbiota is the chief function regulator of many human

body systems. It stimulates the immune system function including its non-intestinal portions (thymus, bone marrow, spleen, regional lymph nodes, blood, etc.). The characteristic of human microbiota is studied by means of microbiological investigations that enable to obtain results of the large intestine microbiota functional state and physiological impact on organs of practically healthy people. Bacteria that belong to the main autochtonous obligate anaerobic microbiota are constantly detected in all practically healthy people not depending from microbiota type.

The condition of the large intestine microbiota in practically healthy people with bacteroid microbiota type has not been studied specially, and no records are found concerning this microbial type in scientific literature. Among 181 practically healthy examined people, bacteroid large intestine microbiota type was detected in 31 (17,13 %) practically healthy people. The main microflora of practically healthy people comprises obligate anaerobic bacteria of *Bacteroides, Bifidobacterium, Lactobacillus, Peptostreptococcus* genus, as well as optional anaerobic and aerobic bacteria of *Escherichia* and *Proteus* genus. The additional large intestine microbiota of these people is manifested by yeast-like fungi of *Candida* genus. The same analytical, microecological indices are relevant for bacteria of *Bacteroides, Bifidobacterium, Lactobacillus* and *Escherichia* genus – constancy index 100 %, frequency of occurrence 0,15 e.u., Whittaker's generic variety index – 4,49 e.u., Simpson and Berger-Parker's generic domination index constitutes 0,25 and 1,00. *Peptostreptococcus* and *Proteus* possess slightly lower values of microecological indices.

For domination level identification of a certain microorganism species in a large bowel cavity of a practically healthy person the Simpson's and Berger-Parker's generic domination indexes have been calculated. The inhabitants' relationships in a large bowel cavity have been characterized with the help of Zhakkard's coefficient which is one of the most reliable indexes of microorganism relationships in association.

Among representatives of neutral flora of the large intestine content in practically healthy people with bacteroid type, the highest population level is detected in bacteroids (9,26±0,08 lg CFU/g). It has appeared to be 31,16 % lower in *Bifidobacteria. Lactobacteria* – 36,78 %, *Peptostreptococci* – 10,63 %, *Peptococcus* – 16,04 %, *Proteus* – in 2,44 times, *Staphylococci* - 90,14 %, yeast-like fungi of *Candida* genus – 90,13 %.

Rotar D.V.

PROSPECTS OF THE RESEARCH OF ANTIMICROBIAL ACTIVITY OF COLLOIDAL LIQUIDS OF CUPRUM NANOPARTICLES

The Department of Microbiology and Virology
Higher state educational institution of Ukraine
"Bukovinian state medical university"

Despite rapid progress in the creation of drugs and the development of pharmaceutical technologies, infectious diseases caused by bacteria, remain one of the biggest public health problem throughout the world, affecting millions of people each year. Almost all organisms are able to resist pharmacotherapeutic intervention due to the rapid evolution of genetic mechanisms leading to the formation of resistance and makes it necessary to review the strategy and tactics of antibiotics. Nowadays the requirements have changed not only to antibiotics but also to antiseptic preparations, which have to be strong, be of long duration, active against resistant strains and do not violate skin microbiocenosis, especially the stability of the resident population of microbes. However, large pharmaceutical companies are losing interest in the development of new antimicrobial agents; they also invest their funds in much more profitable researches, reducing the appearance of new chemotherapeutists and antiseptics in the pharmaceutical market.

New nontraditional solutions are required to overcome these problems. In this connection, the operations based on nanotechnology arouse the interest. As it is known, physical and chemical properties of nanoparticles (NPs) are different from their macroanalogues owing to the increasing of the chemical potential of a large specific surface area and, consequently, high penetrating ability and adsorption activity. Such modification of properties provides a high damaging effect of nanoparticles of the substances which in the normal state have antimicrobial activity, moreover the severity of antimicrobial effects depending on the technology of synthesis of particles, their size, chemical nature of the coating, stability of derived systems, the type of microorganism, etc. Cu nanoparticles are characterized by such unique properties and can be used as antimicrobials, but with the access to air, colloidal solutions of copper nanoparticles are unstable in comparison with to nanoparticles of gold and silver.

The aim of the research is to find the ratio between output components for getting stable colloidal liquids of cuprum nanoparticles and installing the spectrum of their antimicrobial action.

Colloidal liquids of nanoparticles of copper were synthesized for the study by the recovery of copper salt ($CuSO_4$ - $5H_2O$) with tetrahidrobarate of natrium ($NaBH_4$) at temperature of 20°C, pH = 6.0. Absorption spectra have been recorded using a spectrophotometer USB-650 (Ocean Optics). Installation of antimicrobial properties has been conducted by micromethod of two-fold serial dilutions in polystyrene plates using Takachi's microtitrator.

Analysis of antimicrobial properties showed that the liquid №17 (Cys:Cu:$NaBH_4$ - 6,15:1:1,76) in a 1:16 dilution showed minimal fungistatic action, and in a dilution of 1:8 - minimum fungicidal action against 4- hour test culture *C. albicans*. The tested solution caused the violation the population level of test-culture *C. albicans*, which reduced 2.5 times from $2,8\times10^5$ CFU/ml to $1,17\times10^5$ CFU/ml (range of uncertainty (M±2δ) – $1,17\times10^5\pm3,06\times10^2$).

The study showed the presence of expressed fungistatic properties in colloidal liquids of nanoparticles of copper (Cys:Cu:$NaBH_4$ - 6,15:1: 1.76) in a 1:16 dilution, that reflected in violation of population level of test-culture *C. albicans*.