Glomerular filtration rate calculated for creatinine regardless of CYP11B2 (rs1799998) genotypes, correlates directly with GFR cystatin-C (r= 0.82; p<0,001) and depends inversely on the creatinine and cystatin-C concentration in the blood, glucose blood level in C-genotype carriers (r= -0.53; p= 0.042), as well as age (r= 0.51-0.54; p<0.05) and sex: in women with TC-genotype GFR creatinine is lower than in men (r= -0.38; p=0.02). In EAH patients GFR for cystatin-C regardless of CYP11B2 gene (rs1799998) genotypes correlates strongly negatively with creatinine and cystatin-C in the blood (r= 0.96-0.98; p<0.001). In patients with TT-genotype, GFR-cystatin-C is related moderately and inversely to the waist/hip circumference ratio (r = -0.52; p <0.011). The dependence of CKD development on GFR-creatinine in the examined population of EAH patients for all polymorphic variants of the CYP11B2 gene (rs1799998), and on GFR-cystatin-C for *T*-allele carriers can be approximated by logit-regression equations.

Models for approximating the CKD manifestation in EAH patients are capable for GFR-creatinine for all CYP11B2 gene genotypes of (rs1799998), GFR-cystatin-C – only for *T*-allele carriers of this gene.

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AROMATIC HETEROCYCLES AND THEIR SIGNIFICANCE IN HUMAN LIFE

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Nowadays, most educated people have at least a general notion about proteins, fats and carbohydrates and the role of this triad of substances in the processes of life. Less awareness is shown in relation to the so-called heterocyclic compounds, or heterocycles, the significance of which in the chemistry of living things, however, is no less, and the variety of manifestations is even much wider than that of proteins, fats and carbohydrates.

Heterocycles, and more specifically, some purine and pyrimidine derivatives, play a fundamental role in the transmission of hereditary traits. Not surprisingly, textbooks on organic chemistry mention both these compounds and the structure and function of nucleic acids. However, on the basis of extremely concise information, it is difficult for students to form a holistic view of the reasons why nature has chosen heterocycles to achieve these goals.

Heterocyclic compounds are quite common in wildlife. Thus, heterocycles of the purine and pyrimidine families are an integral part of the nucleic acids responsible for the storage and transmission of hereditary information. The interaction of purine and pyrimidine derivatives in the system of hydrogen bonds underlies the processes of replication, transcription and translation, the basis of the functioning of any living cell.

Heterocyclic compounds play an significant role in the chemistry of natural compounds and biochemistry. The functions performed by these compounds are quite diverse - from structure-forming polymers (cellulose derivatives and other cyclic polysaccharides) to coenzymes and alkaloids.

Some heterocyclic compounds are obtained from coal tar (pyridine, quinoline, acridine, etc.) and from the processing of vegetable raw materials (furfural). Many natural and synthetic heterocyclic compounds are valuable dyes (indigo), drugs (quinine, morphine, acridine, pyramidone). Heterocyclic compounds are used in the production of plastics, as accelerators of rubber vulcanization, in the film industry.

Long before the development of pharmaceutical chemistry, people treated diseases using heterocyclic compounds from a natural pharmacy: leaves, fruits and tree bark, roots, grass stalks, insect extracts, etc. Probably no other natural compound has as many stories as quinine. Quinine is one of the members of a large family of alkaloids - nitrogen-containing organic compounds of predominantly plant origin. Almost all alkaloids are derivatives of nitrogenous heterocycles. Quinine has played a historical role in the fight against malaria. An example of another alkaloid is papaverine, which is used in medicine as an antispasmodic and vasodilator.

Few of us can do without a cup of tea or coffee during the day, their invigorating effect is caused by the presence in the leaves of tea and in the fruits of coffee alkaloids of the purine group -

caffeine, theobromine and theophylline. All of them are stimulators of the central nervous system, increase the vital functions of tissues, increase overall metabolism. Theophylline and theobromine are used in medicine as a vasodilator, as well as diuretics. The twentieth century is sometimes called the century of the Great Medical Revolution. One of its bright symbols, of course, is considered to be b-lactam antibiotics - penicillin and cephalosporins, which have saved millions of lives. Both are also derivatives of heterocyclic compounds.

Of course, this is only a small part of what heterocycles are interesting for. It is also worth mentioning the outstanding role of heterocycles in the respiratory process and energy conservation, photosynthesis, production of pesticides, dyes, heat-resistant polymers, analytical reagents and many other practically important materials. In recent years, heterocycles have been closely linked to a rapidly advancing branch of science, supramolecular chemistry, which studies the patterns of self-organization of molecules and their recognition of each other.

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NEW PROGNOSTIC MARKERS OF HEARING IMPAIRMENT IN CHILDREN: GENE-GENE INTERACTION AND APPROXIMATION MODELS

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Nowadays 466 million people are estimated to be living with hearing loss (6.1% of the world's population). More than 5% - 360 million people (328 million adults and 32 million children), suffer from severe hearing loss.

The aim of the study is to evaluate the gene-gene interaction, assess the risks and develop some approximation models of hearing loss / deafness occurrence in children, depending on the genes polymorphism gab junction B2 (*GJB2,* rs80338939), and interleukin-4 (*IL-4*, rs 2243250) and other risk factors.

Study included 102 children with hearing impairment: 68 with sensorineural (SNHL) and 34 with conductive hearing loss (CHL), among them 36 (35.29%) girls and 66 (64.71%) boys. The patients' age varies from 8 to 18 yo (on the average 13.90±3.11 yo). Diagnosis set by otorhinolaryngology (ENT) methods: ENT examination, computer audiometry, impedancemetry, tympanometry.The control group included 60 practically healthy children: 22 girls (36.67%), 38 boys (63.33%). Polymorphism of *GJB2* (rs80338939) and *IL-4* (rs 2243250) genes was studied by polymerase chain reaction method. Risk assessed by Relative Risk, Odds Ratio and 95% Confidential intervals.

The combination of 35delG / TT, as well as Non-Del / TT and 35delG/ TC genotypes in the genome is associated with a high risk of hearing loss in general children population (from 0.932 to 1.432; OR=19.5; p=0.003), as well as the appearance SNHL (from 0.765 to 1.765), stronger than the combination of unfavorable homozygotes TT / 35DelG - 1.765. The combination of homozygotes for the wild allele of both genes (especially CC / Non-Del) is associated with a low risk of deafness: hearing loss in general -1,068, for SNHL -0,908, for CHL -0,750 ($p<0,01$), for CC / 35delG combination, or TC / Non-Del: in general -0.068 -, and for SNHL -0.235 and -0.11 respectively, ($p>0.05$).

Infectious diseases in anamnesis (meningitis, measles, mumps, or rubella) increases the likelihood of CHL by 9.41 times (OR=12.0; p=0.007). Concomitant chronic non-obstructive and obstructive upper and lower respiratory tract diseases increase the risk of both SNHL and CHL in children regardless of age: for SNHL 3.75-7.81 times (OR=6.50-10.9; $p\leq0.028$-0.01), for CHL – 4.29-8.75 times (OR=6.19-12.9; $p\leq0.03$-0.009). The revealed dependence of the indicators is best described by the logit-regression approximating models with high multiple correlation coefficient ($R^2=0.9761$); low standard error of the model estimation ($\varepsilon=0.1114$); connection criterion F=124.2; degrees of freedom df=7.43 ($p<0.001$).

Thus, genes polymorphism's *GJB2* (rs80338939) and *IL-4* (rs 2243250) and their interactions are new prognostic markers of hearing impairment in children. Approximating models describe the likelihood of SNHL and CHL in observed population.