

## **Polymorphism of Blood Markers to Assessment of Genetic-Biochemical Adaptation of the Population to Conditions of the City with Advanced Chemical Industry**

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### **Introduction**

Assessment of conducted ecological researches in Bashkir Republic has shown characteristic of long-term pollution of an environment and food products polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). Actuality of this problem for the Republic is induced more and by that on its territory are situated two largest plants of Russia on manufacture of chlorinated herbicides. The analysis of sources of air pollution in Ufa, Sterlitamak and Salavat has shown, that the heaviest quantity of PCDDs and PCDFs is received into atmosphere of Sterlitamak (in 2-3 times more than in Ufa, and to tens of times higher of the phone values). In samples of women's milk from Sterlitamak in comparison with "standard" distribution are relatively high of concentrations from tetra- up to hexa- PCDDs at a level 40 - 187 ng/L and PCDFs (1). It is also found out the whole number of polycyclic aromatic hydrocarbons and thereof chlorinated compounds. The similar spectrum of chemicals was found out and in dietary products.

### **Material and Methods**

In conditions of toxic effect of the factors of environment of the cities with advanced chemical industry of present interest to evaluate character of interrelations between really acting environmental influence and distribution of biochemical polymorphic markers of blood the adaptive importance of which is known. In two national groups (79 Bashkirian and 129 Russian) inhabitants of Sterlitamak study of character of distribution of 5 polymorphic loci (transferrin (Tf), haptoglobin (Hp), protease inhibitor, group-specific component, group of blood AB0) was conducted by isoelectric focusing (2-3).

## Results and Discussion

At evaluation of uniformity of observable distribution to expected phenotypes on locus Tf, in the group of Bashkirian of the city an authentic deviation is revealed. Whereas, in all investigated systems on our studied samples, the empirical frequencies of phenotypes are distributed pursuant in accordance to theoretically expected.

Feature, characteristic for both groups of the city-dwellers, namely – significant increase of concentration alleles Tf \* C3 and Hp \* 2 is observed. This change is accompanied by redistribution of concentration of alternate alleles: for locus Tf the frequency Tf \* C1 decreases, concentration gene Tf \* C2 grows, for the locus Hp is observed regression of concentration of allele Hp \* 1.

It is known, that allele Tf<sup>C2</sup> is associated with formation of increased number hydroxyl radicals (4), and phenotype Hp2-2 correlates with intensive current lipoperoxidation (5).

The increased level of formation of hydroxyl radicals lead to grow of intensity of microsomal oxidation, as the first phase of detoxication of xenobiotics. Researches, conducted in Sterlitamak earlier had diagnosed of induction of processes microsomal oxidation at children and ascending of lipoperoxidation, of called intake of xenobiotics. The high level of microsomal oxidation at the population of the city with advanced chemical industry has positive character at stage of fast detoxication in conditions of pollution burden. Probably, that individuals with alleles Tf<sup>C2</sup> and Hp<sup>2</sup>, having an increased level of detoxication, are better adapted to adverse effect of the environmental factors of industrial character.

The increase of concentration of given alleles in studied population is represented reasonably by the adverse phenomenon, since a share of the persons, bound to damage of subcellular structures grows, and as the consequence-it is increased sick rate, oncologic risk and etc.. On our sight, the increase of concentration of adverse alleles at the inhabitants of Sterlitamak (in the point of view of formation of increased number of hydroxyl radicals) promotes a more effective detoxication of xenobiotics. The observable shift in frequencies of alleles indicates about process of adaptation in the population under effect of technogenic pollution of environment.

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