Participants of the project "Nutrition and Health of Indigenous People of the North" (NUHIP) gathered for a workshop in Oulu, Finland, May 4-6, 2004 to report their current findings and to discuss about possible future studies. The workshop was organized by the Centre of Arctic Medicine at the University of Oulu and ArctAn-C Innovative Laboratory (Russia) and hosted at the Kastelli Research Centre by Prof. J. Hassi, Dr. H.Säkkinen, and Mrs J.Orava. The meeting was sponsored by the International Arctic Science Committee (IASC). Scholars and doctoral students from Bulgaria, Finland, Italy, and Russian Federation attended the meeting.

Juhani Hassi (Finland) welcomed the workshop’s audience and acquainted them with the history of Kastelli Research Centre and Centre for Arctic Medicine, and also with the subjects of current researches in Oulu University connected with Arctic health. Later on, participants had an opportunity to visit the superbly equipped laboratory complex of Kastelli Research Centre for cold-related physiological research. The excursion served as a good stimulus for reflections on possible themes of joint interdisciplinary researches (in particular, studying the genetic basis of cold resistance).

Andrew Kozlov (Russia), as NUHIP Project leader, described the history of the Project and pointed out main achievements and questions. Four years of work on the Project, he said, have allowed to reveal a number of the most actual problems requiring profound research. The purpose of the meeting has become a discussion on the themes of common interest for all the participants at the following stages of the Project.

The first scientific session of the meeting was devoted to infections and nutrition-related diseases. The main speakers were researchers from Finland: Pekka Saikku ("Effect of chronic Chlamydia pneumoniae infection on lipid metabolism"), and Maija Leinonen ("Effect of dietary flavonoids on Chlamydia pneumoniae infection"). In co-presentation "Epidemiology of Helicobacter pylori in Arctic: influence of traditional
and "marketed" food", A. Kozlov reported preliminary unpublished data collected in communities of Mansi and Khanty of Western Siberia by T. Grozdova, Yu. Chernenkov, A. Kozlov, G. Vershubsky (Russia and Bulgaria). In the presented material, the significance of some type of local foods as natural protectors against cardiovascular diseases, gastric ulcer, and lung diseases, spreading in northern communities was shown.

The second session of the Workshop, the Genetic control of metabolism, started from the discussion on how knowledge on genetic regulation of metabolism in the population of high-altitude regions is insufficient. Researches on lipid metabolism are in the focus traditionally. However, as a consequence of population changes characteristic for the contemporary Arctic, study on control of carbohydrate metabolism has growing practical importance. In the presentation "Genetic changes and metabolism: the case of Saami" A. Kozlov revealed the connection of gene pool changes, characteristic for present northern populations, with the raise in frequency of genes increasing intensity of carbohydrate metabolism.

Svetlana Borinskaya (Russia) gave examples of genetic control of metabolism in different groups of humans in her presentation. She considered blood cholesterol level regulation (APOE gene) and sensitivity to alcohol (ADH1b gene). She raised important questions about allele frequencies’ changes in various natural conditions and on possible role of environment, social and cultural factors in manifestation of different alleles as risky or protective.

Francesca Luca’s and Fabio di Giacomo’s (Italy) presentation "Population structuring in Russia: Preliminary data for an investigation on food related genes" considered two points. The first was an importance of study of the spread of two genes relevant in metabolic context, i.e. NAT1 and NAT2 genes, encode enzymes involved in both metabolism and detoxification of aromatic and heterocyclic amines. These compounds are present in certain foods and as environmental pollutants. The second point was connected to technical aspects of study of NAT2 variants. In order to avoid ambiguities intrinsic to the traditional genotyping, Italian colleagues developed a technical assay (HAPLO approach) with the aim of separating the two haplotypes for each individual. A re-sequencing approach, to detect the full extent of variation, is then applied to each haplotype, separately.
Thus, topics considered at the session "Genetic control of metabolism" covered an array of theoretical, applied and technical problems of population genetic study of nutrition in the indigenous people in the Arctic.

In the third session, results obtained in studies on nutrition and health in Northern Finland and among Saami people of Russia were discussed. Galina Vershubsky (Russia/Bulgaria) presented a semi-longitudinal study of nutritional status and physical development of infants and children of Kola Saami completed in 1995-97. In the whole, although children of Kola Saami seem retarded in comparison with the "all-Russia" fitness standards, their nutritional state and fitness should be regarded as satisfactory. Conclusion is that international (WHO) and even national standards are not always valid for specific, in anthropologic sense, ethnic groups of Arctic.

Jaana Laitinen (Finland) presented data on nutrition of the Northern Finland 1966 and 1986 birth cohorts. In the course of this investigation no attention was paid to ethnic differences in nutrition, but the material could be used for comparison with the data from indigenous communities of Arctic regions of Scandinavia and Russia. In particular, it would be interesting to compare data on fitness of newborns (as a measure of nutritional state of the mother and the baby), and also to compare data of genetic studies.

The Workshop revealed that genetic aspects of investigations are of a great interest for all the organizations cooperating in the NUHIP Project. Regrettably, many undergoing genetic and genetic-related programs have not supposed to study the specific problems of Arctic regions, including nutrition of indigenous people. Taking into account that the NUHIP project should be formally completed in May 2005, the participants of the Workshop have proposed to continue the initiated genetic research in the frame of a new international project - Genetic diversity and adaptation to Arctic conditions.

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