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ICT • ECO-ENERGY • ENVIRONMENT •

HEALTH • TRANSREGIONAL CO-OPERATION

- **Composition of Iodine-Containing Biologically Active Nutrients and Drugs**

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**UNIA EUROPEJSKA**  
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FUNDUSZ SPOŁECZNY



*Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego*

## *Major research vectors of Institute of Pharmacology and Biochemistry*

- *To develop a number of amino acids-containing medical drugs and other natural biologically active compounds*
- *To study in the field of molecular mechanism of development liver and thyroid gland diseases, carcinogenesis and pathological conditions related to deficiency of micronutrients, stress, alcohol abuse*
- *To develop methods of diagnostics and human diseases corrections*
- *To develop and produce test-systems for medical application*

## Composition of Iodine-Containing Biologically Active Nutrients and Drugs

- 1. The problem of thyroid pathology is very topical both for Belarus and Poland as well as for many other countries of the world.
- 2. Iodine, as an essential nutrient, is of paramount importance as a regulator of thyroid function.
- 3. Presently the population of most countries consume iodide without any control.

# Express-test to control bodily iodine status



# Express-test to control bodily iodine status

## ■ General characteristics

- - The test provides for high sensitivity of measurements (10  $\mu\text{g/l}$  iodide), which makes possible to diagnose mild, moderate and severe deficiencies.
- - The assay time varies from 1 to 7 minutes (depending on the biological material tested).
- - The test procedure is simple and can be performed not only in clinic but also at home.
- - The use of this test will considerably simplify the procedure and accelerate examination of a great number of subjects during epidemiologic research.

## DIAGNOSTIC TESTS AND MEDICINAL PREPARATIONS FOR CONTROL AND TREATMENT OF THYROID DYSFUNCTION

- However, the absence of iodine deficiency in developed countries have not
- caused a decrease in the rate of thyroid diseases. Moreover, uncontrolled iodine consumption necessitates studies on the effect of high iodine doses on the functional thyroid activity and their participation in the pathogenesis of thyroid diseases.
- The consumption of high iodide doses produces thyroid dysfunction with development of both hypothyrosis and hyperthyrosis. Experimental and epidemiologic studies have shown that high iodide doses can initiate autoimmune diseases and thyroid cancer.

## Composition of Iodine-Containing Biologically Active Nutrients and Drugs

Which drugs are used for elimination of iodine deficiency and treatment of endemic and nodular goiter?

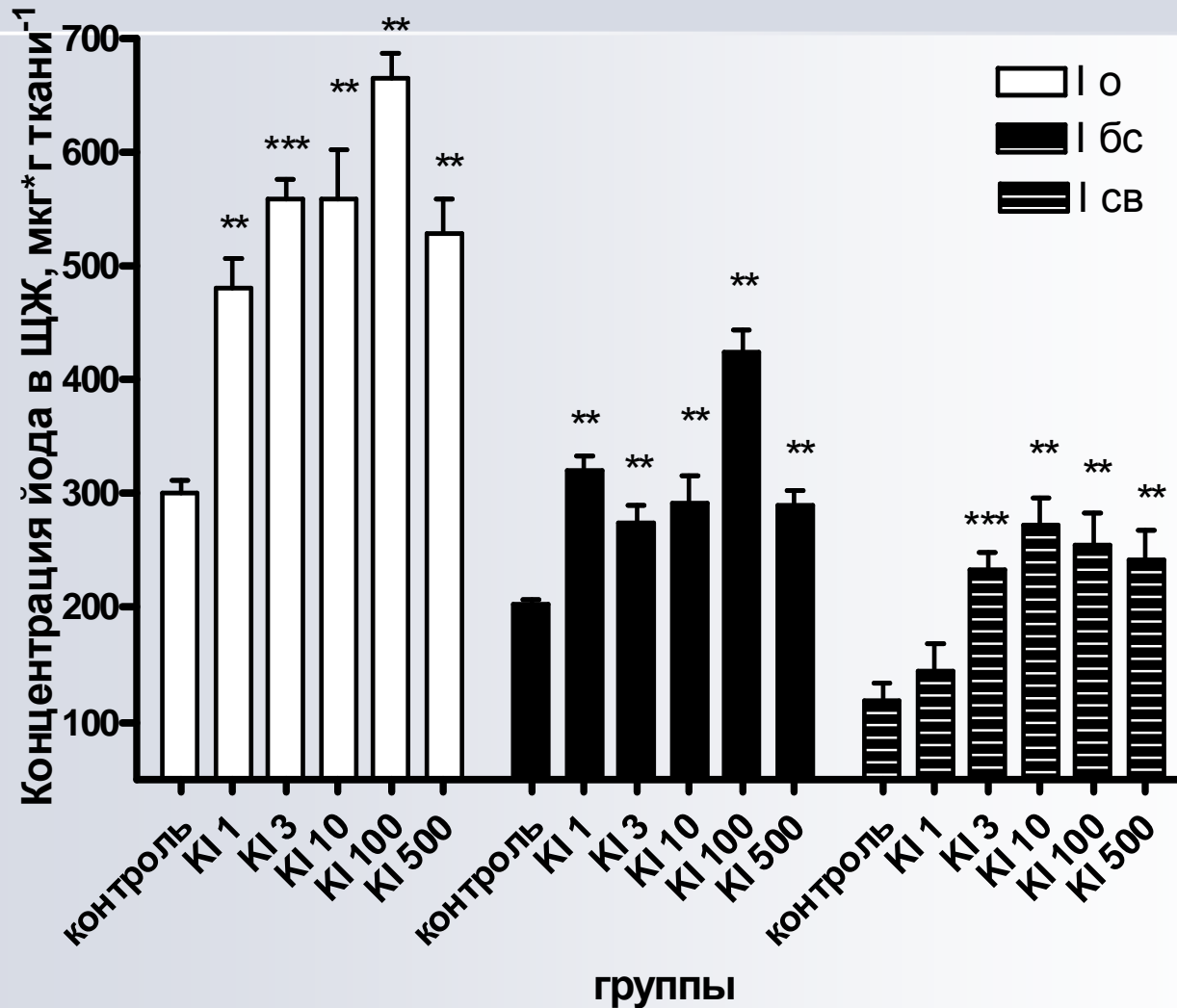
- Inorganic iodine substances.
- Potassium iodide (KI).
- Potassium iodate (KIO<sub>3</sub>).

## **Composition of Iodine-Containing Biologically Active Nutrients and Drugs**

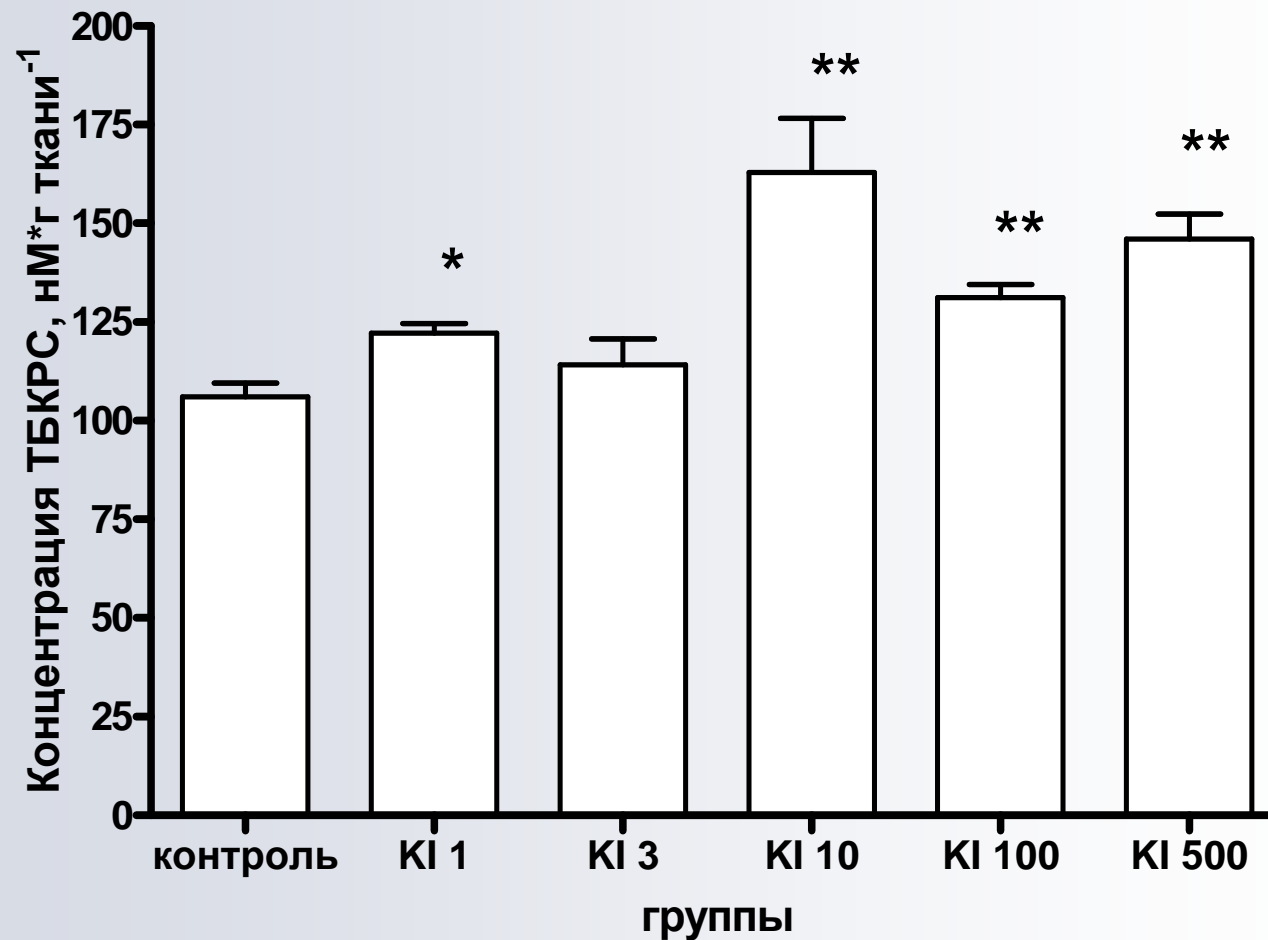
The consequence of increase of iodine-containing drugs intake are:

- Excessive accumulation of iodine in thyroid gland (total, protein-bound and free),
- Oxidative stress activation,
- Increasing of thyroglobulin iodination.

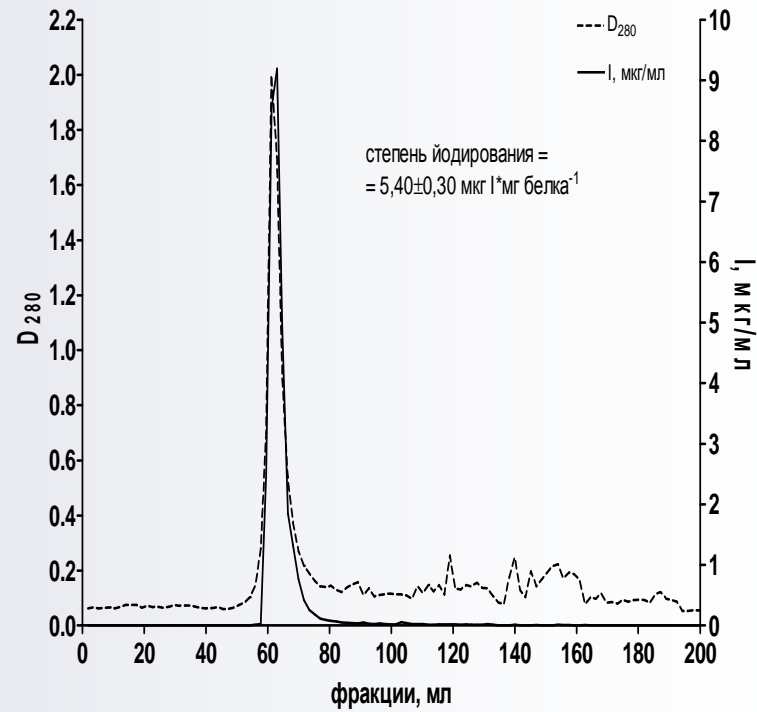
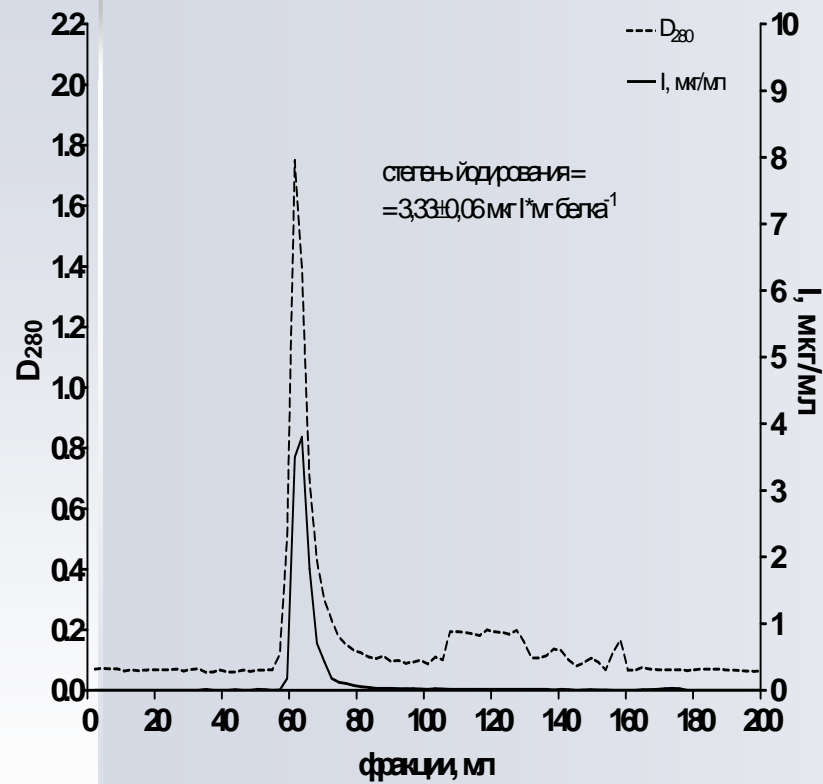
Effect of long-term administration of different doses of potassium iodide on concentration of total, protein-bound and free iodide in the thyroid of Wistar rat females



# Effect of long-term injection of potassium iodide on concentration of TBARS in the thyroid tissue



# Effect of long-term injection of potassium iodide on thyroglobulin iodination rate in the thyroid tissue



## **Composition of Iodine-Containing Biologically Active Nutrients and Drugs**

We are work centered in the search for a new generation of iodine-containing drugs:

- iodine-containing bioactive medications based on natural compounds of vegetable and microbial origin,
- iodinated bioactive food additive.

# Composition of Iodine-Containing Biologically Active Nutrients and Drugs

- *Aim of project:*
- *- to improve the efficiency of endemic goiter treatment among children, adolescents and adults;*
- *- to decrease the duration of treatment and to normalize thyroid function;*
- *- to create bioactive compounds containing iodine to foodstuff production.*



## Composition of Iodine-Containing Biologically Active Nutrients and Drugs

We are work centered in the search for a new generation of iodine-containing drugs:

- iodine-containing bioactive medications based on natural compounds of vegetable and microbial origin,
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# Composition of Iodine-Containing Biologically Active Nutrients and Drugs

Main advantages our medications:

- *to improve the efficiency of endemic goiter treatment among children, adolescents and adults;*
- *- to decrease the duration of treatment and to normalize thyroid function;*
- *- to create bioactive compounds containing iodine to foodstuff production.*
- improvement of foodstuff quality.

## **Composition of Iodine-Containing Biologically Active Nutrients and Drugs**

- We are searching for possibility of cooperation in frame of projects directed on:
- Study of mechanisms of metabolic syndrome,
- Development of cell tests for pharmaceutical substance screening,
- Cell technologies.



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■ Thank You!

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