**CONTRACT 76323 (Internal SUBI number for reference purposes)**

**«Study of body regenerative process after chronic effect of external gamma-radiation and incorporated tritium».**

Performance period: 1976-1980

**Publications**

Scientific research report (final). Principal investigator and executive K.N. Muksinova, ex. V.S. Voronin, Е.N. Kirillova, N.А. Koshurnikova et al. – FIB-1,1980. – Inv. no. 1301. – 1vol. – 114 p. – 2 vol. – 117 p., 51 tables, 83 fig., 49 references. Contract materials were sources for 15 papers, of them published – 7.

Muksinova KN, Murzina LD, Voronin VS, Sukhodoev VV: [Cell count changes in the lymphoid tissue in the chronic action of tritium oxide and external 137Cs gamma radiation]. Radiobiologiia 1981, 21(5):737-743.

Murzina LD, Muksinova KN: [Change in bone marrow hematopoiesis during chronic exposure to tritium oxide and external gamma radiation]. Med Radiol (Mosk) 1982, 27(8):61-66.

**Background**

The information was gathered from 221 male Wistar rats that were used in SUBI’s experiment no. 76323. The collection and collation of the information was done as part of Task 2.3 (“Evaluation of the SUBI tissue archive and database as a potential part of the European archive”) of the previous EURATOM-funded project STORE (Sustaining access to Tissues and data frOm Radiobiological Experiments; contract number 23228), which was coordinated by BfS, Germany (see <http://cordis.europa.eu/project/rcn/89386_en.html>) .

The information given here is based upon SUBI’s 18 months and 42 months reports.

It has been shown in the STORE project, that the biological material from the experiments conducted by SUBI can still be used. The respective Standard Operating Procedures are available on the STORE website (<http://www.storedb.org/store_v3/documents.jsp> ).

**The Study**

Study population: 224 male rats

Exposure: Chronic exposure to tritium oxide (NTO), chronic external gamma radiation, control

Exposure patterns:

* Tritium 5 times a week over three or six months: 370, 37 and 3.7 kBq/g/day, respectively
* Gamma: external 5 times a week over three or six months
* controls

Outcome of interest:

* changes in radiosensitive tissues
* individual system
* entire body.

Absorbed doses: 12.5, 1.08, 0.12 Gy and 25.3, 2.02 and 0.24 Gy for 3 and 6 months, respectively, for tritium. External γ- radiation in comparable daily and total doses.

**Results**

Change of radiosensitive tissues, individual systems and body as a whole both during the process and after NTO administration is clearly determined by value of daily intake of the radionuclide. Rats with chronic NTO intake with doses 3.7·104 and 37·104 Bq/g body mass per day showed increase of malignant tumors frequency. According to factors characterizing deviation from the norm in the studied tissues and systems, as well as by late effects of NTO chronic intake it was found that NTO administration by 3.7·103 Bq/g (dose≤ 0.24 Gy)per day was safe for rats and mice[[1]](#footnote-1) at prolonged intake. Larger effects from NTO exposure, compared to external γ-radiation by 137Cs, were registered for damage and regeneration of radiosensitive tissues, suppression of immunoreaction, and late effects. Comparative coefficients were calculated. The report presents characteristics of mice immune reactions after chronic tritium oxide intake. In the course of the program structural damage of somatic cells chromosomes were studied during protracted administration of tritium oxide to rats and after it. The work presents results of study of rats’ lifespan and tritium oxide chronic intake tumor effects, malignant neoplasms frequency increase in exposed animals.

**Biological material**.

Paraffin-fixed biological material is available for 221 male rats from six experimental groups. The preparation method is described in STOREDB File 10865, accessible through <http://dx.doi.org/doi:10.20348/STOREDB/1041/1070> .

In 3 test and control groups late effects of exposure (LEE) were assessed for external (γ) and internal (β) prolonged exposure (3 levels of dose); in other 3 groups of test and control animals pathology dynamics (PD) was studied in different periods during and after γ- and β-exposure. Six experiments and biomaterial are characterized in the Table 1.

A few slides are available, too. This is shown in Table 2.

**Further relevant information**

This study is in close relation to study 86323 (see <http://dx.doi.org/doi:10.20348/STOREDB/1056/1162> ).

Detailed information on the available organs per animal and on their causes of death can be found within STORE at <http://dx.doi.org/DOI:10.20348/STOREDB/1041> .

**Contact information**

If you want to use the material or have any detailed questions regarding the study you should contact SUBI through [inter\_dep@subi.su](mailto:inter_dep@subi.su). If you have any questions regarding this short summary report, please contact Dr. Bernd Grosche ([bgrosche@t-online.de](mailto:bgrosche@t-online.de)).

1. The experiment included mice, too, but respective information is not available. [↑](#footnote-ref-1)