Questionnaire

for the extraordinary session of the PAC for Condensed Matter Physics for the assessment of the project JINR “Radiogene” «The molecular genetics of radiation-induced changes at the gene, genome and transcriptome level in *Drosophila melanogaster*» (2017-2022, LNP)

PART A: Achievements

1. Contributions of the JINR group:

- For the first time in the JINR and member- countries, the LNP JINR group is conducting the genome- wide molecular investigations using advanced DNA technologies to study the spectra (quality and frequency patterns) of DNA changes inherited by offspring of animal males irradiated by different quality radiation aimed to estimate the genetic hazard (risk) of radiation for progeny at the molecular level.

- The responsibilities of JINR group members within the management structure of the collaboration: I.D. Alexandrov – head of the project; K.P.Afanasyeva - deputy head of the project which provide leadership and communication between the participants of the collaboration (2017-2022).

2.   Publications:

- E.V. Kravchenko, A.N. Rusakovich, F.Elnoamany, S.V. Dubovic, S.E. Hassab El-Nabi, M.V. Alexandrova, and I.D. Alexandrov. Radiation biology of Structurally Different Drosophila Genes. Report VII. The *white g*ene: General Characteristics and PCR Assay of the Gene “Point” Mutations. Radiation. Biol. Radioecology, 2019 v.59, No 5, 453-464.

The JINR group contribution: I.D. Alexandrov -analysis of the quality and frequency patterns of γ- and neutron-induced *white* mutations, general management and author of the manuscript; M.V. Alexandrova - cytogenetical analysis of the *white* mutations; E.V. Kravchenko –PCR assay; A.N. Rusakovich –PCR assay and co-author of the manuscript.

- I. D. Alexandrov and M.V. Alexandrova. The dose-, LET-, and gene-dependent patterns of DNA changes underlying the point mutations in spermatozoa of *Drosophila melanogaster*. I. Autosomal gene *black.* Mutation Res., 2021 (in press).

3. PhD theses: Not expected.

4.   Talks:

- No invited plenary talks.

- List the parallel talks:

- International Congress "VII Congress of the Vavilov Society of Geneticists and Selectionist" June 18-22, 2019, St.- Petersburg:

1. I.D. Alexandrov, M.V. Alexandrova, Sequencing as a scientific basis for modern assessment of the genetic risk of ionizing radiation.

2. N.E. Kharchenko, K.P Afanasyeva, I.D. Alexandrov, Enhancers of the *vestigial D. melanogaster* gene are located in large introns of the gene.

3. K.P.Afanasyeva, N.E.Kharchenko., I.D.Alexandrov Molecular analysis of radiation-induced mutations *vestigial no- wing* *D. melanogaster*.

- International conference “Drosophila in Genetics and Medicine”, Gatchina, 30 Sept - 2 Oct. 2020:

1.I. D .Alexandrov, M. V. Alexandrova, Genetic consequences in offspring of irradiated male parents *Drosophila melanogaster.*

2. K.P. Afanasyeva, I. D. Alexandrov. Radiation-induced DNA changes detected by sequencing of *vestigial nw* mutants of *Drosophila melanogaster.*

3. N.E. Kharchenko, K.P. Afanasyeva, I. D. Alexandrov, Genetic and molecular analysis of the *vestigial-strapGla (vgsGla)* mutation in *Drosophila melanogaster.*

- International Student Practice in JINR Fields of Research: K.P. Afanasyeva – Supervisor of the project “PCR assay of radiation -induced mutation lesions in the vg gene of *Drosophila melanogaste*r”, 2019.

PART B: Plans and requests

5.   Plans

- The following molecular works were planned in 2021-2022: Genomic studies to detect the spectrum of inherited DNA changes in F1 offspring of Drosophila males irradiated by 60Co γ-rays; Sequence analysis of structural gene mutations; Fish hybridization of radiation- induced structural gene mutations; To study the transcriptomes of Drosophila lines with different radiosensitivity; To develop the software for automatized analysis and pre-analysis of the molecular data obtained by Sanger sequencing.

6.   Group size, composition and budget

- The JINR personal involved in the project: I.D. Alexandrov - chief researcher, Dr. Biol. Sci.; M.V. Alexandrova - senior researcher, PhD; K.P. Afanasyeva - researcher, PhD; N.E. Kharchenko -engineer; E.V. Kravchenko - - senior researcher, PhD; S.V. Korablinova – engineer; L.N. Korovina – engineer; A.N. Rusakovich – junior researcher; O.P.Solodilova – engineer. The total number of people in the collaboration is 11.

- The JINR group budget for the period 2021-2022 remains in the planned amount. However, due to the observed delays in the supply of enzymes and other consumables necessary for molecular works from foreign suppliers in connection with the pandemic, there is a fear that there will be a need to extend the project and adjust the budget.