

Affiliation: Masaryk University, Faculty of Medicine
Study program: PhD program Biomedical Sciences
Specialization: Biochemistry and Molecular Biology
Workplace: Department of Biology, Faculty of Medicine, MU
Form of study: Full-time

Supervisor: Nicola Silva (silva@med.muni.cz)

Title: Identification and characterization of novel factors required for faithful chromosome segregation and DNA repair during meiosis

Brief annotation (max 200 words):

During meiosis, programmed induction of DNA double-strand breaks is essential to promote crossover formation, which in turn produce physical attachments between the parental chromosomes to allow their faithful segregation into the gametes.

We employ genetic and biochemical tools aimed at identifying new factors required for proper induction of meiotic breaks, as well as for their correct repair, as aberrant/unrepaired DNA damage during gametogenesis can cause inheritable mutations that can result in cancer predisposition and aneuploidies.

We use *Caenorhabditis elegans* as model organism, a non-parasitic nematode that has emerged as a powerful system for studying chromosome dynamics.

C. elegans offers several advantages, including high tractability, a fast vital cycle that allows generation of mutant backgrounds in very short time windows, high amenability for cytological studies and genome editing technique work with incredibly high efficiency, allowing generation of specific mutations or tagging of endogenous loci with high precision and fast outcome.

DNA repair pathways are highly conserved across species and *C. elegans* carries the great advantage of allowing their in-depth analysis in a simpler model, providing as a powerful tool to shed new light on the intricate genetic networks that drive DNA repair in the gametes, ultimately ensuring maintenance of genome integrity.

Funding: The PhD position will be partially funded (on top of the scholarship) by the institutional support.

Requirements:

We are seeking a highly motivated candidate who is curious about science and is not afraid of commitment. A solid background in genetics and biochemistry is highly desirable.

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Please quote the Reference Number in your reply.

Requirements to successfully obtain a PhD degree in the Biomedical Sciences PhD program:

- Have at least one first author publication in an international research journal with an impact factor above the median IF in the field or have two first author publications with the IF in Q3. Importantly, the affiliation to the Faculty of Medicine, Masaryk University must be listed.
- Gain a set of minimum credits (240 ECTS in 4-year study period), pass 4 faculty-wide courses + an English language course and 4 field-specific courses.
- Pass the doctoral state exam.
- Take an active part in teaching.
- Participate in the annual PhD conference.
- Present research outcomes at least once at an international conference (poster, presentation).
- Spend at least one month abroad on an internship.

Additional information on the supervisor: <https://biology.med.muni.cz/en/research/nicola-silva-group/about>