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TRIAD

D3.1: Report on Training in Methodologies, Tools, and Transferrable Skills

Reporting period: May 2024 – September 2025
Lead beneficiaries: UoC, iMM, MU
Related DoA objectives: O2 (inclusive training plan; methods/tools); O5 (proposal skills)

Introduction

Deliverable D3.1 (D5, WP3) focuses on strengthening TRIAD's methodological expertise and providing structured training opportunities for early-stage researchers (ESRs), postdoctoral fellows and group leaders. During the reporting period, the consortium implemented a broad training program, spanning technical skills, transferable competencies and responsible research practices. Activities were delivered through regular lecture series, hands-on workshops, retreats and participation in international symposia. An important element of this deliverable was the joint development of methods, such as the TERRA Nanopore sequencing pipeline, which functioned both as a training tool and as a means of consolidating research collaboration within TRIAD.

Activities

1. Lecture Series and Methodological Exchange

The TRIAD Lecture Series established a regular platform for methodological training and exchange. Organised monthly across the partner labs, the series featured talks from the Krejčí, Garinis and Azzalin groups, which went beyond research results to include detailed discussions of protocols and tools. The design of the series deliberately sought to enhance collaboration and ensure that trainees were exposed to the breadth of expertise available within the consortium.

2. Training Embedded in the Lisbon Meeting

The 1st TRIAD Meeting (Lisbon, November 2024) incorporated several structured training components. Facility tutorials introduced participants to advanced flow cytometry workflows and the RHINO live-cell R-loop imaging pipeline, while technology transfer workshops provided practical lessons in intellectual property management and translational pathways. In addition, a hands-on translational session led by the Garinis group demonstrated targeted extracellular vesicle-mediated delivery of nucleases. These activities combined technical instruction with practical translational perspectives, bridging research and application.

3. Retreat Workshop: Methods and Transferable Skills

A major milestone was the TRIAD Retreat Workshop (Drevníky, September 2024), which blended methodological training with transferable skills development. The program included a practical AlphaFold2 workshop on protein interaction modelling, a multi-day workshop on Critical and Creative Thinking in Science addressing cognitive bias, and a Science Communication workshop. Round-table discussions with mentors provided further career development support. This retreat illustrated TRIAD's commitment to training that integrates scientific expertise with broader professional skills.

4. Responsible Research and Open Science

The consortium also invested in responsible research training. The EMBO Research Integrity and Open Science Workshop (Brno, February 2025) convened leading experts to present best practices in reproducibility, transparency and data sharing. These sessions, hosted at CEITEC, equipped both trainees and PIs with practical tools to integrate responsible research principles into their work.

5. Collaborative Method Development

Another highlight of D5 was the collaborative development of a TERRA Nanopore sequencing pipeline by the Garinis and Azzalin groups. This effort had dual significance. It expanded methodological capacity by creating a novel tool to profile TERRA transcripts across telomeres, and it also functioned as a training exercise. Students and postdocs were directly involved in protocol optimisation, data analysis and cross-lab sample handling. The collaboration therefore simultaneously strengthened methodological expertise and deepened cross-group integration.

6. Participation in International Symposia

In addition to internal training, TRIAD members engaged with international forums that provided exposure to advanced methodologies. Michaela Pospíšilová (Krejčí group) gave a talk at the EMBO YIP Meeting on Genome Integrity (Istanbul, 2025). Jakub Cibulka (Krejčí group) presented a poster at the EMBL Symposium on Phase Separation (Heidelberg, 2024). Athanasios Siametis (Garinis group) presented on transcription stress-induced telomere dysfunction at the EMBL Symposium on the Ageing Genome (Heidelberg, 2025), while Kalliopi Stratigi (Garinis group) also presented a poster at the same event. These opportunities allowed ESRs and postdocs to represent TRIAD in international settings, gaining both feedback on their work and valuable networking experience.

Outcomes

The training program delivered several tangible outcomes. Participants acquired practical skills in flow cytometry, imaging, Nanopore sequencing, homologous recombination assays, AlphaFold modelling, and extracellular vesicle delivery. Transferable skills such as science communication and critical thinking were strengthened through structured workshops. Importantly, responsible research principles were mainstreamed into training via the EMBO integrity workshop. The

TERRA Nanopore sequencing collaboration generated not only methodological expertise but also a sustainable model of joint training and research integration across the consortium.

Impact

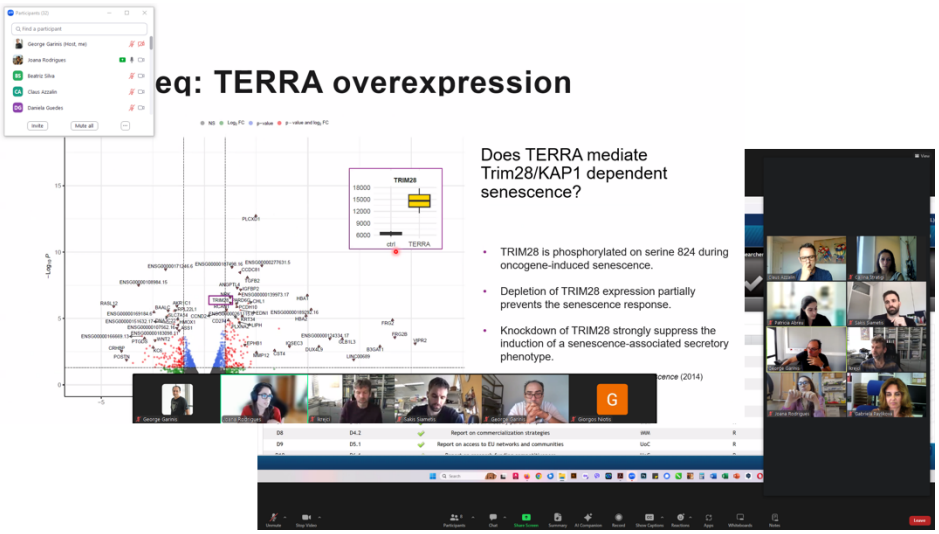
The cumulative impact of these activities is the emergence of a highly skilled and interconnected TRIAD community. ESRs and postdocs now possess hands-on expertise in diverse methodologies, positioning them to contribute effectively to joint projects. Methodological convergence across groups has improved interoperability and reproducibility, establishing a foundation for co-publications and future project proposals. Furthermore, international visibility through talks and posters has embedded TRIAD trainees within global research networks. The emphasis on responsible research ensures that methodological advances are pursued with transparency and integrity.

Next Steps

Looking forward, TRIAD will broaden its training offer through a Summer School on Telomere Biology (Azzalin, 2025) and an AlphaFold workshop (Krejčí, October 2025). The consortium will also publish a shared SOP pack covering flow cytometry panel design, RHINO imaging, Nanopore TERRA sequencing and extracellular vesicle delivery quality control. Structured feedback will be collected from participants in future trainings to quantify learning outcomes. Collectively, these actions will consolidate and sustain TRIAD's methodological and training achievements over the long term.

Annex

- Lecture series agendas and photos.



Exploring the role of RAD51 interaction with G4s in replication

LABORATORY OF RECOMBINATION AND DNA REPAIR

MUNI MED

Supervisor: doc. Mgr. Lumír Krejčí, Ph.D.

Michaela Pospíšilová
September 2024

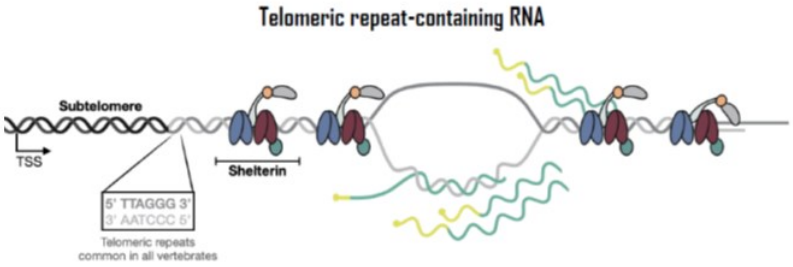
XPF-TOP2B interact to facilitate R-loop-mediated DNA looping and transcription activation

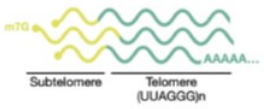
Callina Stratigi, PhD

Garinis Lab – Genome (In)stability and Mammalian Physiology

TRIAD Lecture Series | 31 March 2025

- Lisbon meeting training session slides.





- Transcribed by RNA pol II from multiple chromosome ends
- In humans, two classes of subtelomeric promoters have been identified
- Heterogeneous in length
- m7G cap, but only a fraction is poly-adenylated

TERRA is an **essential component** of telomere biology
e.g., telomere elongation and protection

Characterization of the long noncoding RNA TERRA in a vertebrate

TRIAD
April 28th, 2025

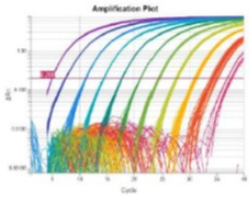
TERRA overexpression system

Studying telomere transcription and its role in senescence

TERRA quantification

RT-qPCR

- Only analyses one telomere at a time.
- Difficult to get specific primers.



Gulbenkian Institute for Molecular Medicine

- TRIAD Retreat program and participant list.

TRIAD Retreat Workshop 2024

Drevníky Resort Slapy

TRIAD

Tuesday 10. 9. 2024

11:00 – 12:00 Arrival

13:00 – 14:00 Lunch

14:00 – 15:45 Introduction

Lumír Krejčí: *Introduction of LORD team and its research focus*

Jana Dobrovolná: *Introduction team at Institute of Molecular Genetics of the Czech Academy of Sciences and its research focus*

16:00 – 19:00

Jana Procházková, Fedor Nikulenkov, Mário Špírek, Vojtěch Staník, Magdalena Kalovská: *Critical and Creative Thinking in Science - our misconceptions about the world, Cognitive bias workshop – part 1*

19:00 Dinner

Wednesday 11. 9. 2024

9:00 – 12:30

Fedor Nikulenkov: *DONSON-MCM3 as an example for protein interaction modelling using AlphaFold 2 workshop*

13:00 – 14:00 Lunch

14:00 – 18:00

Michaela Pospíšilová, Magdalena Kalovská, Magdalena Zacpalová, Kateřina Krejčí: *Critical and Creative Thinking in Science - our misconceptions about the world, Cognitive bias workshop – part 2*

18:00 Dinner

Co-funded by the European Union

TRIAD Retreat Workshop 2024

Drevníky Resort Slapy

TRIAD

Thursday 12. 9. 2024

9:00 – 12:00

Anton Zuev, Tias Saha, Kaustubh Shukla, Aditya R. Aithal: ***Science communication workshop***

12:00 – 13:00 Lunch

13:00 – 18:00

Maria Victoria Marini, Felicity Feiser, Mário Špírek, Vojtěch Staník: ***Critical and Creative Thinking in Science - our misconceptions about the world, Cognitive bias – part 3***

18:00 Dinner time

Friday 13. 9. 2024

9:00 - 12:00 Round-table discussions (feedback to workshops, networking and career opportunities)

12:00 – 13:30 Lunch

Workshop goals and outputs:

- **Training on methodologies and tools** - AlphaFold 2 workshop, Critical and Creative Thinking in Science workshop.
- **Secondments and joint mentorship of PhD students** – participation of PhD students in workshops, close collaboration between LORD lab at MU and Jana Dobrovolna lab at IMG Czech Academy of Science. PhD students and all lab members gained valuable experience and skills.
- **Training in Transferable skills** – workshop on Science communication and Critical and Creative thinking. The participants transferred professional and scientific know-how to each other and enhanced their ability to convey complex concepts to diverse audiences using clear narrative and visual aids as well as practical exercises.

Co-funded by the European Union

- EMBO workshop materials.

CEITEC

EMBO Research Integrity Workshop in Brno, 27 – 28 February 2025

Itinerary:

Speaker:	Sandra Bendiscioli Erica Wilfong Thomas Lemberger
Hosted by:	Lumír Krejčí Pavel Tomančák
Contact person DAY 1	Eliška Janíčková +420 771 279 719
Contact person DAY 2	Zdena Helán Hortvíková +420 778 451 076
PROGRAM - DAY 1: **When: Thursday 27 February 2025** **Where: CEITEC MU, Kamenice 753/5 62500 Brno-Bohunice, pavilion E35/atrium**	8:15 – 8:45 – Transfer to CEITEC MU by local public transport or by taxi services. (more information bellow) 8:45 – 9:00 Technique test at E35/atrium 9:00 – Welcome address at CEITEC MU 9:05 – 9:10 – Pavel Tomančák 9:10 – 9:25 – Sandra Bendiscioli 9:25 – 10:15 – Erica Wilfong 10:15 – 10:45 – Coffee Break at the atrium 10:45 – 11:30 – Thomas Lemberger (lecture) 11:30 – 12:15 – Sandra Bendiscioli 12:15 – 13:15 – Lunch at the atrium 13:15 – 14:00 – Thomas Lemberger 14:00 – 14:20 – Erica Wilfong 14:20 – 14:40 – Coffee Break at the atrium 14:40 – 15:15 – Lumír Krejčí (general discussion)

CEITEC – Central European Institute of Technology
Masaryk University
Kamenice 753/5, 625 00 Brno, Czech Republic
www.ceitec.eu

MUNI

	15:30 – End of the program at CEITEC MU 15:30 – 18:00 – Free time, transfer to hotel 18:00 – 18:30 – Transfer to restaurant 18:30 – Dinner in the centre of Brno Restaurant Element Běhounská 7, Brno
PROGRAM – DAY 2: **When: Friday 28 February 2025** **Where: Masaryk University Rectors office – Žerotínovo nám. 9. / 4th floor, room no. 476** **+** **Masaryk university building at Komenského nám. 2** **3rd floor, room no. 340A**	Masaryk University Rectors office – Žerotínovo nám. 9. / 4th floor, room no. 476 Rector's Office | Masaryk University 9:00-10:00 meeting and discussion with Vice-Deans for Science and Research from all faculties of MU/ led by Pavel Tomančák walk (6 mins) to the Komenského nám. 2 building of MU back part of the building, 3rd floor, room no. 340A 10:15 – 11:30 Round table/closed session with invited guests within the Masaryk University and Brno Technical University
Getting to CEITEC by public transport	Getting to CEITEC MU by public transport You need 60 min ticket (25 CZK at ticket machines or you can use contactless payment with your debit card in the cabin). When entering the bus/tram, mark the ticket/beep your debit card at the yellow machine by the door. The easiest way is to use the Beep&Go system. Simply check in / check out a contactless ticket. Find the timetables for public transport in IDOS. From train station Brno - Hlavní nádraží (Brno Main Railway Station): Walk to tram stop Hlavní nádraží. From Hlavní nádraží take tram No. 8 (direction to Nemocnice Bohunice) to tram stop Nemocnice

EMBO CEITEC MUNI

- TERRA Nanopore training documentation (protocols, example datasets).