



A4L_ACTIONS

Alliance for Life Sciences: From Strategies to Actions in Central and Eastern Europe

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D4.2 Guidelines to address Technology Transfer issues

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INTRODUCTION

The Alliance4Life aims to increase the local and regional impact of Health Research and Innovation in Central and Eastern Europe (CEE). To accomplish this mission, the A4L_ACTIONS project (No. 964997) covers, among others, building competence and connections of the CEE health research institutions for translation of health research outcomes into innovation, development of regional biotech and biomedicine innovation ecosystems and bridging the gap between the industry and academia. *D4.2 Guidelines to address Technology Transfer issues* is a public deliverable of the A4L_ACTIONS project. It falls under the work package **WP4 – Competencies in Innovation for Human Health** (Lead: LIOS). The core of this WP is to bring together industry and academia, outline challenges, and expectations, and share the best practices in terms of future collaboration, co-creation, and co-innovation. This deliverable D4.2 is the outcome of **Task 4.1. Workshops for Technology Transfer professionals (Lead: LIOS, Partners: all, M1-M33)**, which compiles discussions and views of Focus Group “*Knowledge and Technology Transfer*” (FG6) members and opinions of Alliance4Life industry contacts. Addressing the challenges in technology transfer (TT) within Central and Eastern European countries requires a strategic set of guidelines.

METHODOLOGY

FEEDBACK FROM A4L INDUSTRY CONTACTS

The Industry Relationship Platform (WP4) of A4L_ACTIONS aimed to bring together industry and academia to nurture mutual understanding and stimulate collaboration. To initiate the network, the industry contacts around each partner institution were mapped, and a database of industry contacts was created and kept updated (D4.3 *Joint database of CF and potential industry partners*). These contacts were approached by TT representatives from each partner institution with an offer to join the A4L_ACTIONS Industry Relations Platform by participating in A4L_ACTIONS Mini-Conferences. In line with the description of *Task 4.1. Workshops for Technology Transfer professionals*, the *Focus Group # 6. Knowledge and technology transfer* (FG6) members collected feedback from industry contacts that participated in the A4L_ACTIONS project-organized Mini-conferences (report on events compiled as A4L_ACTIONS D2.2 Mini-conference report, WP2). Mini-conferences attracted 16 industry contacts in total (6 in Smolenice, 8 in Lodz, and 2 in Bucharest). After the events, six industry participants agreed to be interviewed by FG6 members by email or call.

SURVEY ON KT ISSUES AND GUIDELINES

In line with the description of *Task 4.1. Workshops for Technology Transfer professionals*, the *Focus Group # 6. Knowledge and technology transfer* FG6 members were asked to provide opinions about the most relevant issues and useful Technology Transfer guidelines within the Alliance4Life network in the respective countries. The opinions were exchanged by FG6 members during the regular focus group online meetings (19.09.2022; 16.11.2022;

01.03.2023; 02.06.2023; 07.09.2023; 08.12.2023), as well as during the FG6 member visit to TTO of Antwerp University on 24.10.2023 (organized as suggested by the A4L_ACTIONS midterm review recommendations) and onsite A4L_ACTIONS TT training workshops run by ASTP trainers in Lodz (27.-28.04.2023) and Zagreb (17.-18.01.2024). After that, the WP4 Head and FG6 Chairs drafted the Survey (Annex 1) which covers issues and guidelines related to the Research government, Technology transfer office, Innovation ecosystem, Industry, and Academia-related topics. The content of the survey was created based on opinions of FG6 members, conversations with ASTP and with awareness to relevant literature¹. The respondents were asked to score the importance of topics by rating from 1 (low) to 5 (high). The survey was conducted during the period from December 2023 to January 2024. KTO representatives from all 11 Alliance4Life countries took part (Czech Republic, Slovakia, Poland, Croatia, Estonia, Lithuania, Latvia, Slovenia, Hungary, Bulgaria, and Romania). The responses were summarized and the average score was calculated for each question.

INDUSTRY CONTACT FEEDBACK

The Industry Relations Platform was introduced as an activity that allows industrial partners to express their contextual needs and expectations (expected scientific results, the field of research they are interested in, what they would like to see, etc.). On the other hand, academic partners used the same network to elaborate on what universities and research organizations can do for the industry. Participants were encouraged to share their insights and experiences, work together to explore the issues at stake, and come to practical solutions for the future. Most of the interactions were initiated by participation in mini-conferences. Mini-conferences were dedicated to certain topics summarized into a few chapters, allowing interesting Q&A discussion after each. The presence of the industry partners was well received by all researchers, expressed by asking questions and showing interest. Overall, industry partners evaluated organized events as a good initial step and foundation upon which more intensive (and certainly needed) collaboration between academia and industry should be promoted. It was noted that researchers provided a good overview of scientific activities in the area:

“Very interesting topics related to my field of activity were covered at the conference, so the conference was very useful for me, a lot of contacts were established with people who are engaged in similar work, and also with those I didn't even know about until now (...)”

Industry contacts noted several points that should be taken into account when organizing similar events in the future. It was advised to have more industry participants per event and more focused topics - both for academic partners and the industry. To have more possibilities to discuss the cooperation possibilities it was recommended to introduce more interactive forms for the researcher and industrial presentations. Matchmaking sessions should not be

¹ Examples of relevant literature include: KTSofSkills Investigation Report by SoftSkills for knowledge transfer (<https://www.ktsoftskills.eu/results>) and the Latvian State Audit summary No 2.4.1-32/2021 on “How to improve business innovation support policy” (<https://www.lrvk.gov.lv/en/audit-summaries/audit-summaries/is-planning-and-implementation-of-business-innovation-policy-effective-and-facilitating-efficiency-and-competitiveness-increase-of-enterprises-2>).

planned as the last activity of the day, as many participants were leaving thus limiting possibilities for interactions. Some more comments:

“Diversified group of experts with respect of scientific focus and interest, probably did not allow for a lot of synergies and/or opportunities for new collaborations”

“(…) giving more time to the industry speakers and maybe having a few more of them and spreading them throughout the program”

Industry contacts noted a lack of technology transfer- and industrial activity-related expertise on the researcher side and suggested training important for collaboration in the future:

“Interesting academic science, but relatively underdeveloped knowledge and mindset related to commercially driven science. Scientists from the region would definitely benefit from education in this area.”

“To enable scientists and companies to speak the same language, it would be advisable for scientists focusing on research with potential applications in drug discovery and development to take short courses [in drug and assay development, quality control, IP issues, business development, financing and licensing strategies among big pharma]”.

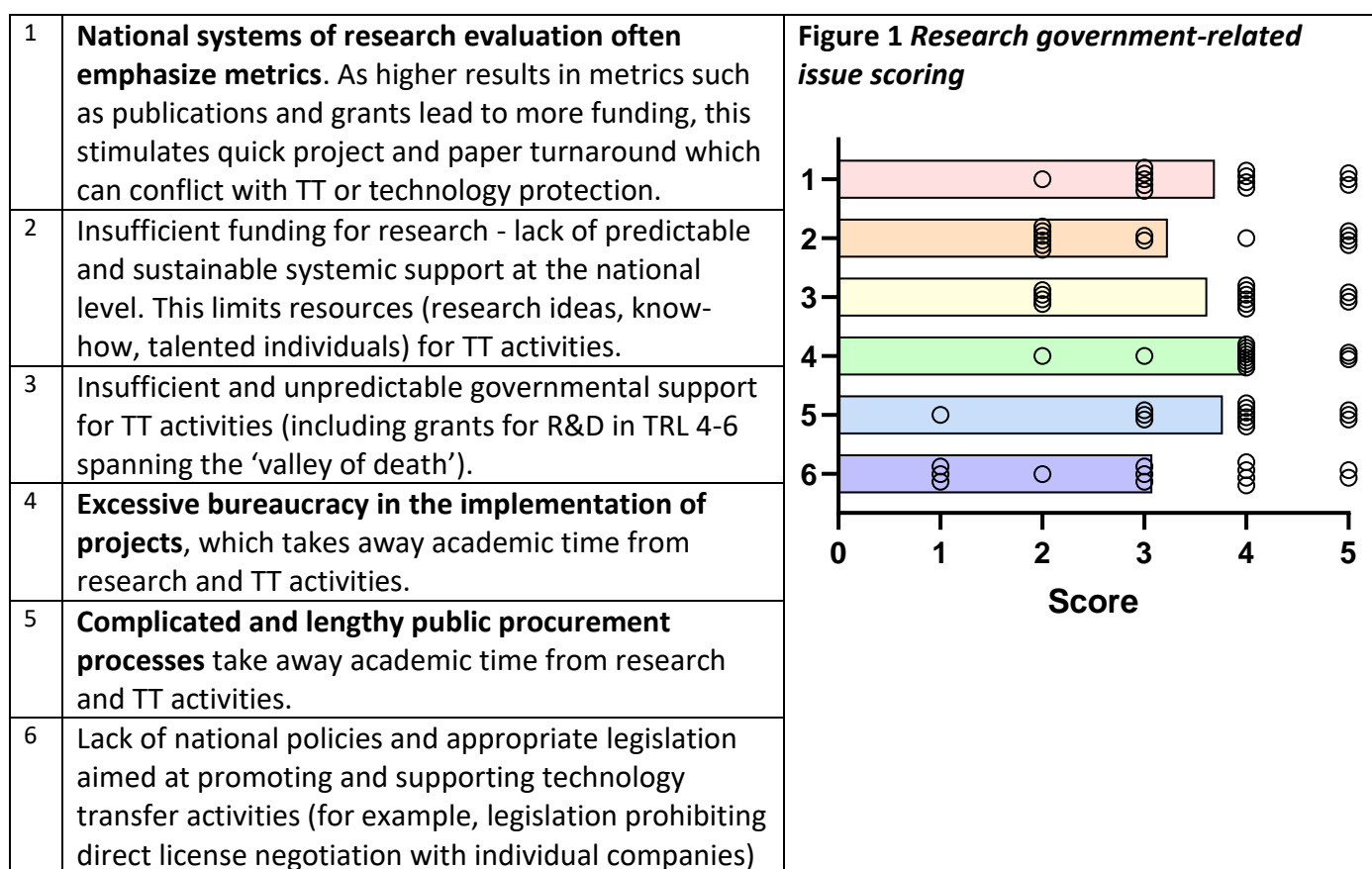
An interesting suggestion was to see industry partners as advisors, not only to perceive them as future investors.

The suggestions will be taken into account when industry and academia interactions are planned in future Alliance4Life events. The presence of KTO specialists and FG6 members from Alliance4Life partner organizations in such events is advisable to provide basic information about industry-specific communication practices for academic researchers from respective institutions and initiate fruitful discussions.

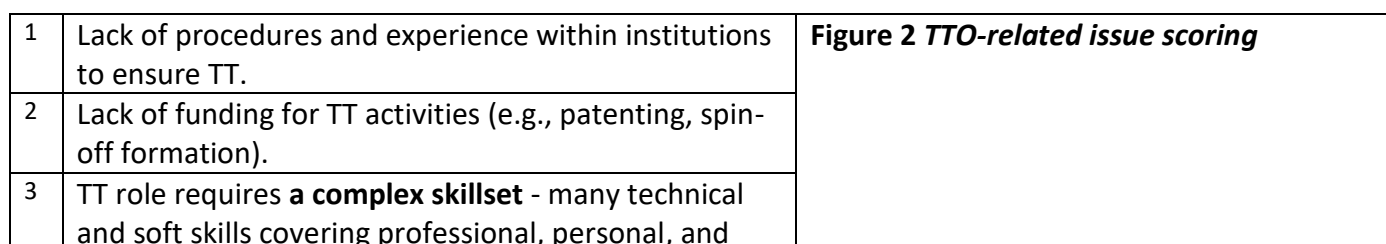
TECHNOLOGY TRANSFER ISSUES

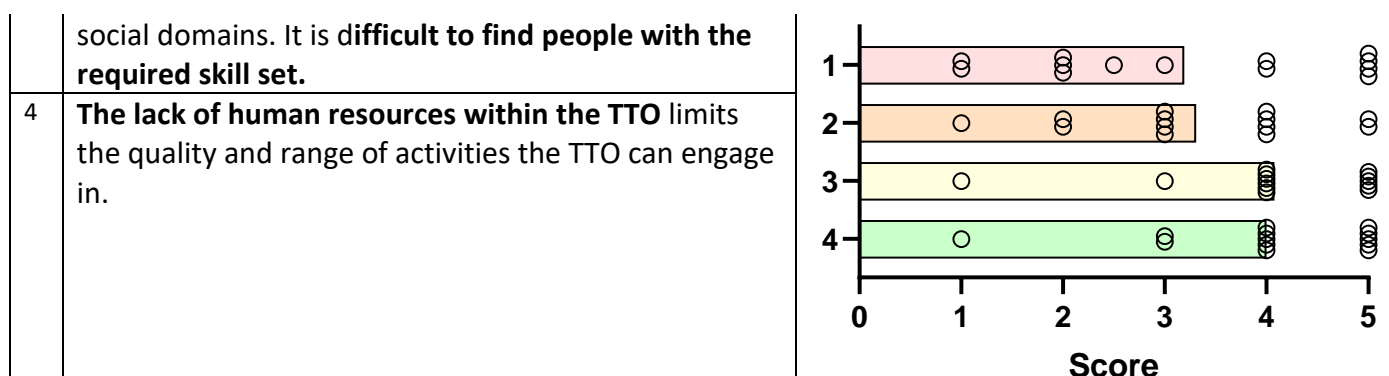
KTO representatives from all 11 Alliance4Life countries took part in a survey covering technology transfer issues and guidelines related to the Research government, Technology transfer office, Innovation ecosystem, Industry, and Academia-related topics.

All Research government-related issues in the survey were recognized as important (scoring 3 or more). The highest scoring received (in bold) an issue of *Excessive bureaucracy in the implementation of projects* (score 4), which takes away academic time from research and TT activities (Fig. 1). It was closely followed by issues of *Metrics-emphasizing national systems of research evaluation* (score 3.7) and *Complicated and lengthy public procurement processes* (score 3.8) which take away academic time from research and TT activities (Fig. 1).

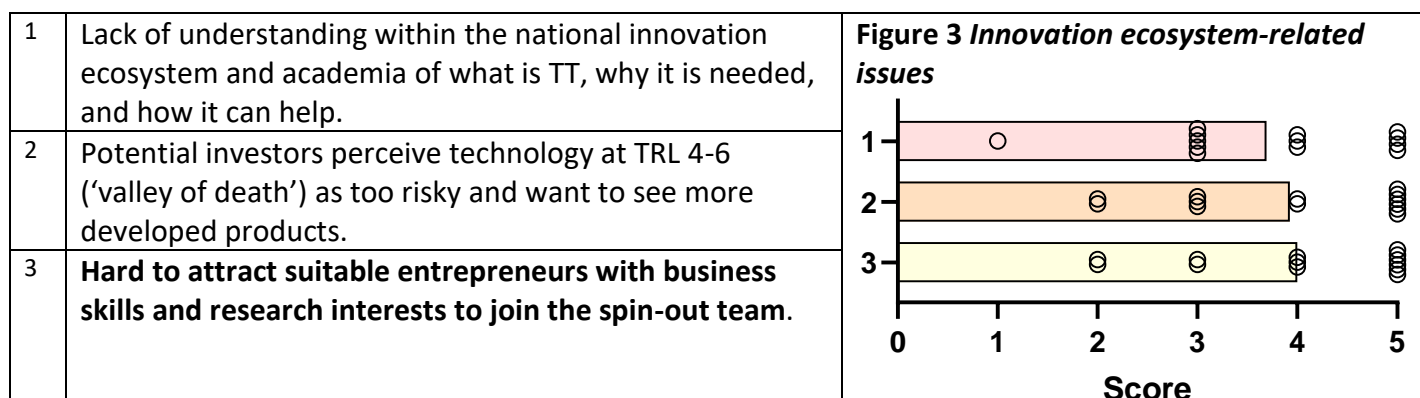


Among TTO-related issues, the highest-scoring topics are *The lack of human resources within the TTO* (score 4) and the *Difficulty in attracting people possessing the complex skillset required for TT expertise* (score 4.1) (Fig. 2).

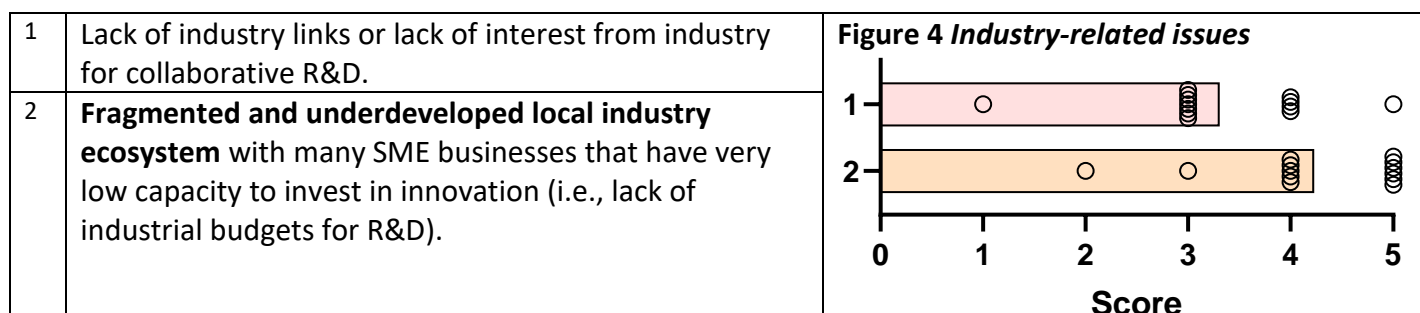




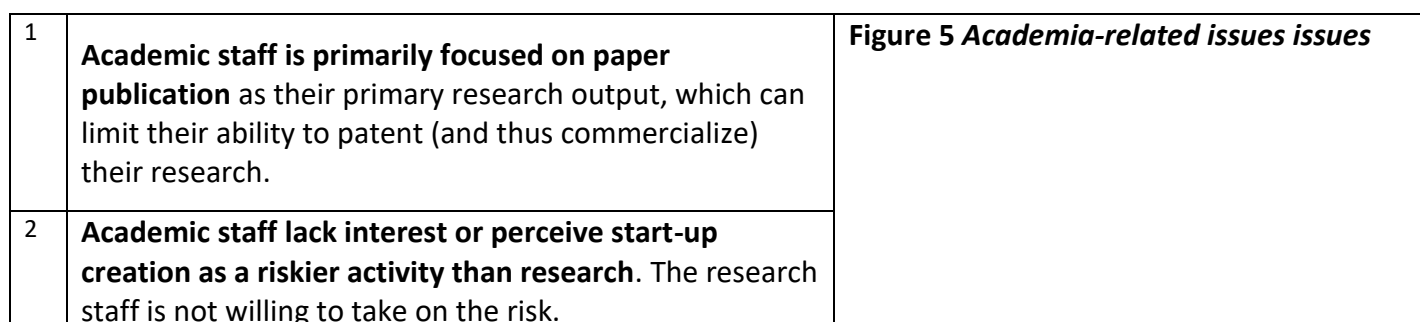
All three innovation ecosystem-related issues were highly rated (>3.5) and noted *difficulty in attracting skilled entrepreneurs interested in joining spin-out teams* (score 4) (Fig. 3).

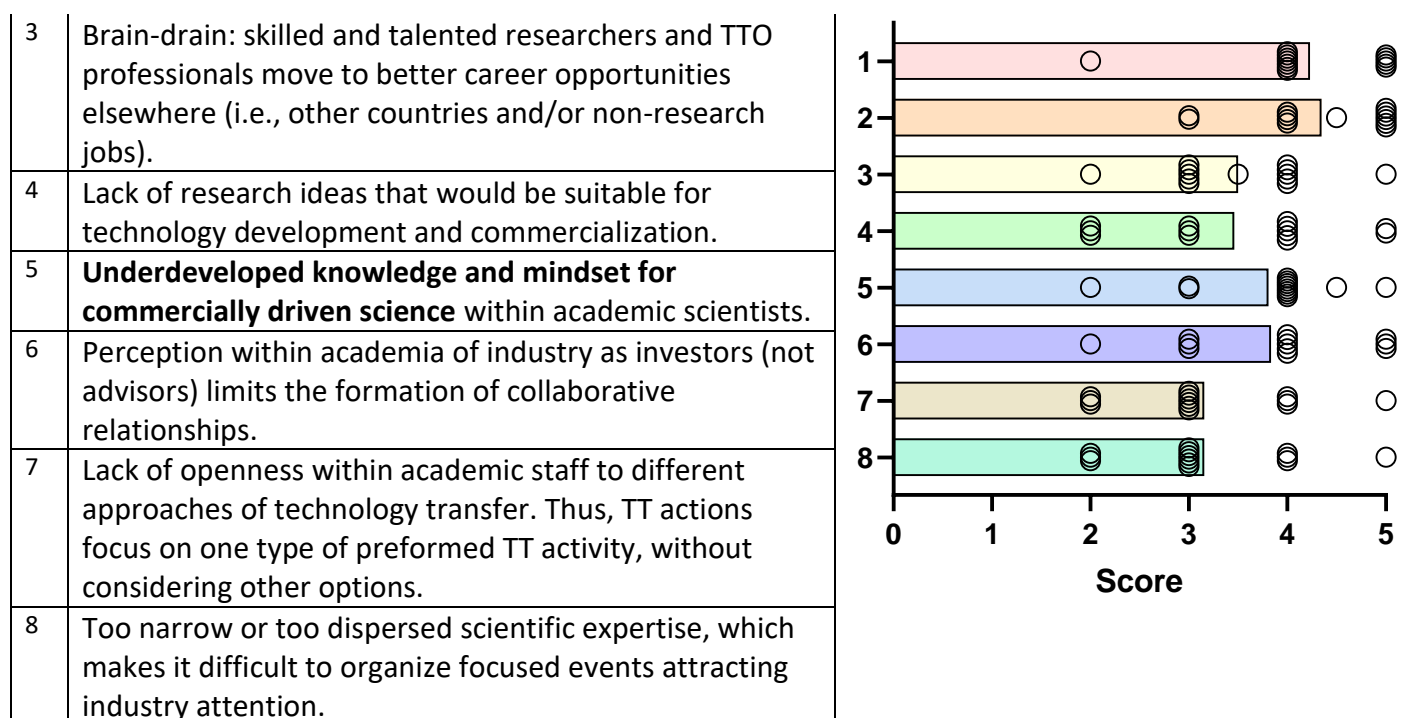


Most of the respondents highly scored the issue of a *fragmented and underdeveloped local industry ecosystem* (score 4.2) as an important problem for successful TT activities (Fig. 4).



Among the academia-related issues, the highest score of >4 was granted to the issue of *academic staff being focused on scientific paper publication* (score 4.2) and *lacking interest or perceiving start-up creation as a riskier activity than research* (score 4.3) (Fig. 5). Also *underdeveloped knowledge and mindset for commercially driven science* and *perceiving of industry partners just as investors and not advisors* were equally scored (3.8).

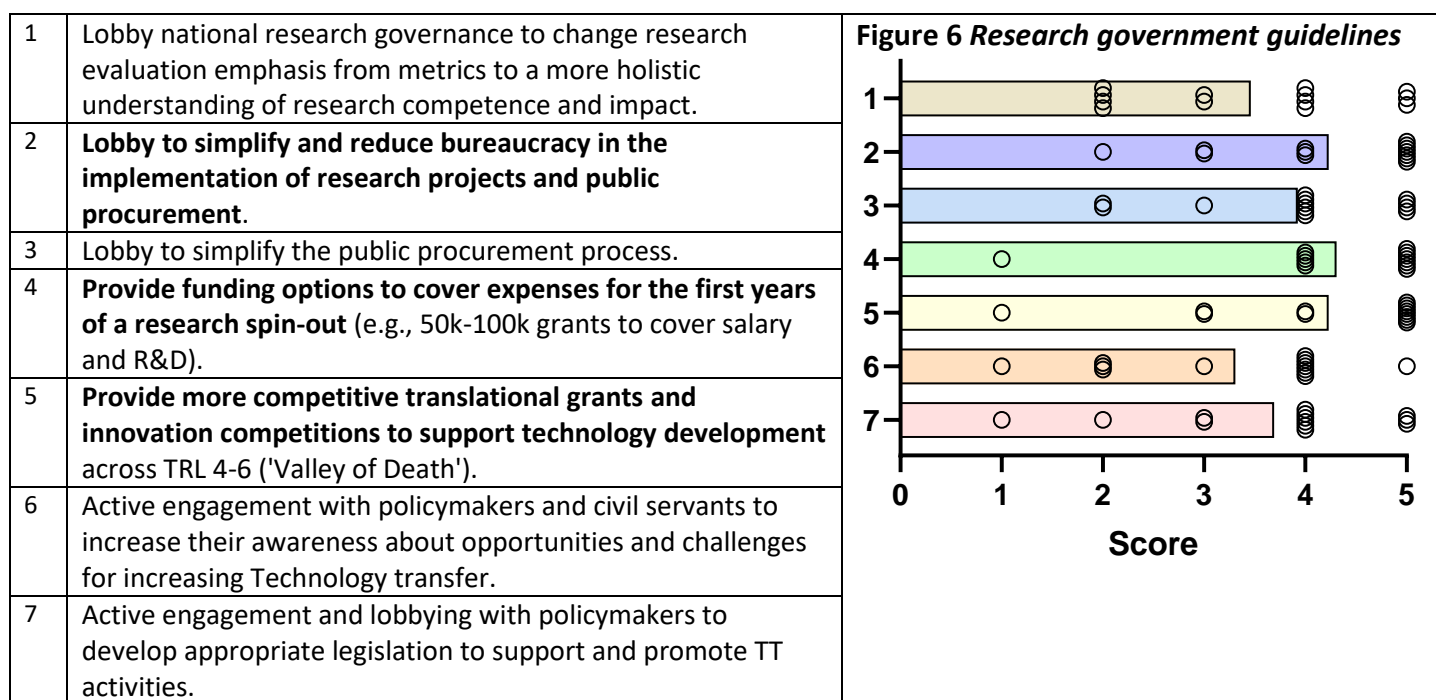




Overall, all 23 issues included in the survey were recognized as important (scoring >3), the highest score among the research government-related issues was received for excess bureaucracy in the implementation of projects, which takes away academic time from research and TT activities. TTO- and innovation ecosystem-related issue scoring revealed a lack of human resources with relevant skillsets, difficulty in attracting interested entrepreneurs, and fragmented and underdeveloped local industry ecosystem as the main problems. These results highlight the multipronged issues and highly complex environment for technology transfer in CEE, where significant improvements across domains of different stakeholders are required to ease and promote transfer of health innovations to market.

TECHNOLOGY TRANSFER GUIDELINES

All suggested Research government-related guidelines in the survey were recognized as important (scoring 3 or more). *Providing more funding options to cover expenses for the first years of a research spin-out* (score 4.3) and *translational grants and innovation competitions to support technology development across TRL 4-6 ('valley of death')* (score 4.2), as well as *lobbying to simplify and reduce bureaucracy in the implementation of research projects and public procurement* (4.2) were suggested as valuable guidelines (**Fig. 6**). To counter the conflict arising from national research evaluation metrics, advocacy for a holistic understanding of research competence is essential. Streamlining bureaucratic processes in project implementation and public procurement, accompanied by lobbying for simplified procedures, can alleviate academic time constraints. Adequate funding, including grants for early-stage spin-outs and competitive translational grants, is crucial to support technology development in the challenging 'Valley of Death' phase.



The highest-rated TTO-related guidelines (**Fig. 7**) were *networking and relationship-building activities* and the *promotion of professional development of TT managers* (both scored 3.8). Active engagement with policymakers, lobbying for supportive legislation, and establishing national support mechanisms for patenting expenses and spin-off establishment are key initiatives. Networking activities, the formation of national TTO associations, and the promotion of professional development for TT managers enhance institutional capabilities.

1	National support mechanisms to refinance expenses on the patenting process and establishment of spin-offs.	<p>Figure 7 TTO guidelines</p>
2	Networking and relationship-building activities to increase the institutional network to reach out for TT activities (e.g., collaborations, professionals to approach for potential spin-out formation).	
3	Forming a national association of TTO practitioners to unite national Technology Transfer Offices and lobby the decision-makers and exchange experiences and best practices	
4	Promotion of professional development of TT managers: taking part in TTO professional networks; and attending training events and conferences.	

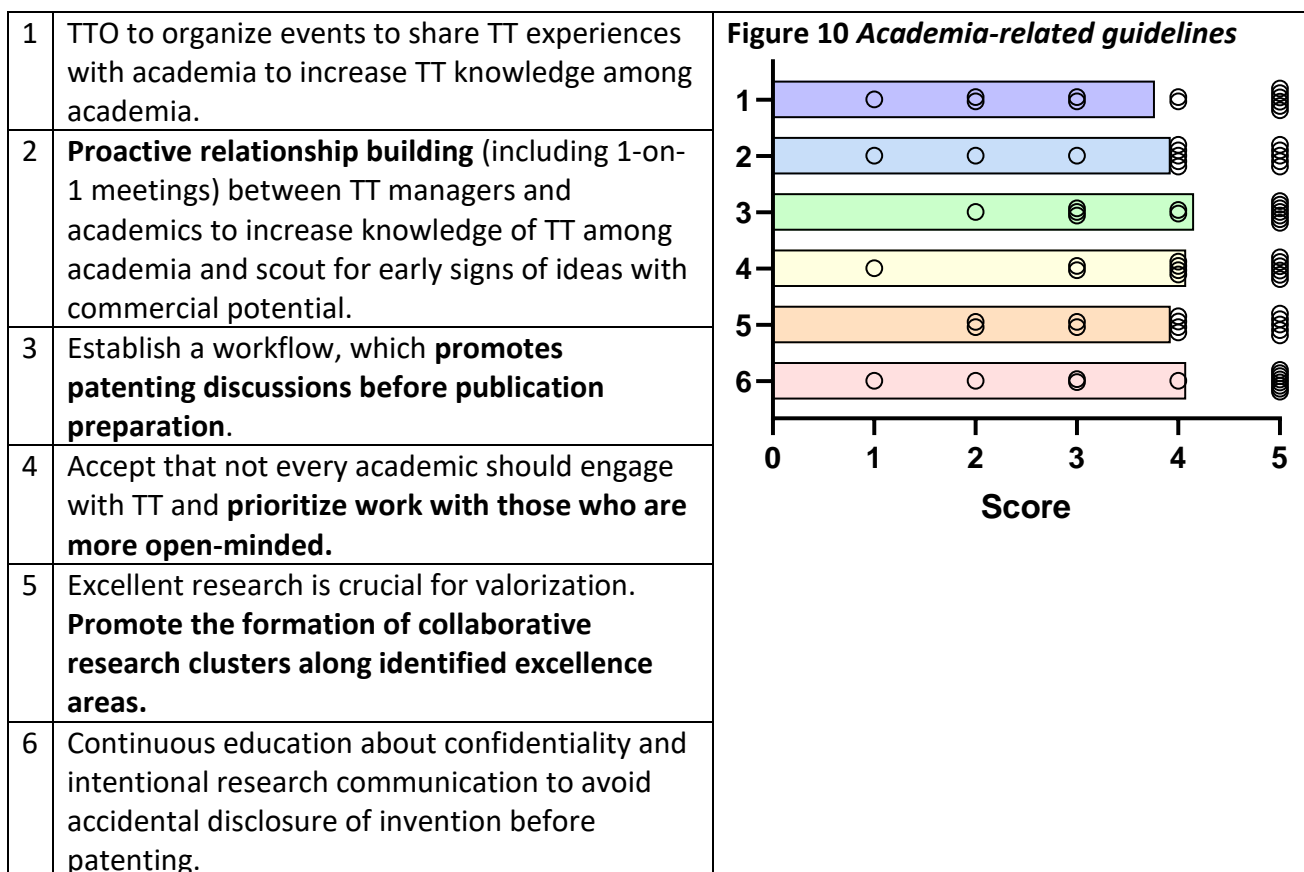
The guideline suggesting TTO *organize events with members of the innovation ecosystem to increase their knowledge about ongoing research and TT processes* got an [average](#) score of 4 (Fig. 8).

1	TTO to organize events with members of the innovation ecosystem to increase their knowledge about ongoing research and TT.	<p>Figure 8 Innovation ecosystem guidelines</p>
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All three suggested guidelines targeting industry got high scores, suggesting *joint PhD student programs* (score 3.9), *organization of industry-focussed events* (score 4.1), and *promoting internship schemes and collaborative research between academia and industry* (score 4.1) as important tools to address technology transfer issues (Fig. 9). Encouraging collaboration between academia and industry through joint PhD schemes, industry-focused events, and internships are expected to facilitate knowledge exchange and potential commercialization opportunities.

1	Joint PhD student schemes to establish long-term relationships with industry members (also a potential future employer of the PhD student).	<p>Figure 9 Industry-related guidelines</p>
2	Organise industry-focused events , such as “Reverse pitching”. Invite industry members to come and pitch what are their problems and what they need, to see if we have any points of contact for collaboration.	
3	Promoting internship schemes or collaborative research between academia and industry	

Also, academia-related guidelines got high scores (scores from 3.8 to 4.2), stressing the importance of *proactive building relationships between TTO and open-minded researchers*, especially excellent ones, opening discussions about *patenting before publishing* to avoid accidental disclosure of invention before patenting (**Fig. 10**).



Building a culture of openness and understanding within academia about the benefits of technology transfer is vital. Implementing a workflow that prioritizes patenting discussions and acknowledging that not every academic should engage with TT are crucial steps. Continuous education on confidentiality and intentional research communication helps avoid inadvertent disclosures. Finally, promoting excellence in research through collaborative clusters and proactive relationship-building fosters a dynamic innovation ecosystem.

SUMMARY & CONCLUSIONS

During formal and informal discussions at the occasion of meetings and other events of the A4L_ACTIONS project and Alliance4Life consortium, members of the FG6 *Technology transfer* raised concerns about issues, and suggested guidelines to address open questions on Technology Transfer practices and the role of KTO offices. The identified technology-transfer-related issues and suggested guidelines to address barriers to successful Health Research and Innovation in Central and Eastern Europe can be aligned as follows:

Issues	Guidelines
National research evaluation metrics conflict with TT objectives	Lobby national research governance to change research evaluation emphasis from metrics to a more holistic understanding of research competence and impact.
Insufficient national-level funding for research	Advocate for predictable and sustainable systemic support for research. Establish funding mechanisms dedicated to technology transfer activities.
Unpredictable governmental support for TT activities	Active engagement and lobbying with policymakers to develop appropriate legislation to support and promote TT activities.
Excessive bureaucracy in project implementation	Lobby to simplify and reduce bureaucracy in the implementation of research projects and public procurement.
Lengthy public procurement processes	Lobby to simplify the public procurement process.
Lack of national policies supporting technology transfer	Active engagement with policymakers and civil servants to increase their awareness about opportunities and challenges for increasing technology transfer.
Lack of procedures and experience within institutions for TT	National support mechanisms to refinance expenses on the patenting process and establishment of spin-offs. Networking and relationship-building activities to increase the institutional network for TT activities.
Insufficient funding for TT activities	Provide funding options to cover expenses for the first years of a research spin-out (e.g., 50k-100k grants to cover salary and R&D). More competitive translational grants and innovation competitions to support technology development across TRL 4-6 ('Valley of Death').
The complex skillset required for TT roles	Promotion of professional development of TT managers: taking part in TTO professional networks; and attending training events and conferences.
Limited human resources within TTO	Forming a national association of TTO practitioners to unite national Technology Transfer Offices and lobby the decision-makers and exchange experiences and best practices.

Lack of understanding within the innovation ecosystem on TT benefits	TTO to organize events with members of the innovation ecosystem to increase their knowledge about ongoing research and TT.
Investors perceive TRL 4-6 technology as too risky	Joint PhD student schemes to establish long-term relationships with industry members (also a potential future employer of the PhD student).
Difficulty in attracting entrepreneurs with business skills	Organise industry-focused events, such as “Reverse pitching”. Invite industry members to come and pitch what are their problems and what they need, to see if we have any points of contact for collaboration.
Lack of industry interest or links for collaborative R&D	Promoting internship schemes or collaborative research between academia and industry.
Fragmented and underdeveloped local industry ecosystem	Organise industry-focused events, where industry members discuss their problems and needs, to see if collaborative research and development can help develop local industry ecosystem.
Academic focus on publication limits patenting and commercialization	Establish a workflow, which promotes patenting discussions before publication preparation. Continuous education about confidentiality and intentional research communication to avoid accidental disclosure of invention before patenting.
Academic staff's reluctance toward start-up creation	Accept that not every academic should engage with TT and prioritize work with those who are more open-minded.
Brain-drain of skilled professionals	Excellent research is crucial for valorization. Promote the formation of collaborative research clusters along identified excellence areas.
Lack of research ideas suitable for technology development and commercialization	Proactive relationship building (including 1-on-1 meetings) between TT managers and academics to increase knowledge of TT among academia and scout for early signs of ideas with commercial potential.
Underdeveloped knowledge and mindset for commercially driven science	TTO to organize events to share TT experiences with academia to increase TT knowledge among academia.
Perception of the industry as investors rather than advisors limits collaboration	Continuous education about confidentiality and intentional research communication and TT experiences with academia to increase TT knowledge and awareness of market insights among academia.
Lack of openness within the academic staff to diverse TT approaches	Proactive relationship building (including 1-on-1 meetings) between TT managers and academics to increase knowledge of TT among academia and scout for early signs of ideas with commercial potential.
Narrow or dispersed scientific expertise affecting industry engagement	Excellent research is crucial for valorization. Promote the formation of collaborative research clusters along identified excellence areas.

In conclusion, the A4L_ACTIONS consortium-suggested guidelines offer a comprehensive strategy to overcome challenges in technology transfer within Central and Eastern European countries. By aligning research evaluation metrics, streamlining processes, securing funding, and fostering collaboration between academia, industry, and policymakers, these countries can create a conducive environment for innovation and successful technology commercialization. Continuous education, proactive relationship building, and a cultural shift towards valuing technology transfer will contribute to sustained growth and competitiveness in the global research and development landscape and facilitate bridging the gap between academia and industry as well as to maximize the socio-economic benefit of A4L_ACTIONS partners' research results.

ANNEX



A4L_ACTIONS Grant agreement #964997
WP4 Task Task 4.1. Workshops for Technology Transfer
professionals
Survey of Issues in Technology Transfer within Alliance 4 Life
Network

Type	Technology Transfer (TT) Issue	Level of impact / How affected are your TT activities by this issue?				
		1 (low)	2	3	4	5 (high)
Research government	National systems of research evaluation often emphasize academic research-related metrics. As higher results in metrics such as publications and grants lead to more funding, this stimulates quick project and paper turnaround which can conflict with TT or technology protection.					
	Insufficient funding for research - lack of predictable and sustainable systemic support at the national level. This limits resources (research ideas, know-how, talented individuals) for TT activities.					
	Insufficient and unpredictable governmental support for TT activities (including grants for R&D in TRL 4-6 spanning the 'valley of death').					
	Excessive bureaucracy in the implementation of projects, which takes away academic time from research and TT activities.					
	Complicated and lengthy public procurement processes take away academic time from research and TT activities.					
	Lack of national policies and appropriate legislation aimed at promoting and supporting technology transfer activities (for example, legislation prohibiting direct license negotiation with individual companies)					
	<i>Any additional suggestions, or comments?</i>					
TTO	Lack of procedures and experience within institutions to ensure TT.					
	Lack of targeted funding for TT activities (e.g., patenting, spin-off formation).					

	TT role requires a complex skillset - many technical and soft skills covering professional, personal, and social domains. It is difficult to find people with the required skill set.					
	The lack of human resources within the TTO limits the quality and range of activities the TTO can engage in.					
	<i>Any additional suggestions, or comments?</i>					
Innovation ecosystem	Lack of understanding within the national innovation ecosystem and academia of what is TT, why it is needed, and how it can help.					
	Potential investors perceive technology at TRL 4-6 ('valley of death') as too risky and want to see more mature products.					
	Hard to attract suitable entrepreneurs with business skills and research interests to join the spin-out team.					
	<i>Any additional suggestions?</i>					
Industry	Lack of industry links or lack of interest from industry for collaborative R&D.					
	Fragmented and underdeveloped local industry ecosystem with many SME businesses that have very low capacity to invest in innovation (i.e., lack of industrial budgets for R&D).					
	<i>Any additional suggestions, or comments?</i>					
Academia	Academic staff is primarily focused on paper publication as their primary research output, which can limit their ability to patent (and further commercialize) their research.					
	Academic staff lack interest or perceive start-up creation as a riskier activity than research. The research staff is not willing to take on the risk.					
	Brain-drain: skilled and talented researchers and TTO professionals move to better career opportunities elsewhere (i.e., other countries and/or non-research jobs).					
	Lack of research ideas that would be suitable for technology development and commercialization.					
	Underdeveloped knowledge and mindset for commercially driven science within academic scientists.					

Perception within academia of industry as investors (not advisors) limits the formation of collaborative relationships.					
Lack of openness within academic staff to different approaches of technology transfer. Thus, TT actions focus on one type of preformed TT activity, without considering other options.					
Too narrow or too dispersed scientific expertise, which makes it difficult to organize focused events attracting industry attention.					
<i>Any additional suggestions, or comments?</i>					

Survey of guidelines for addressing Technology Transfer issues within Alliance 4 Life network

Target	Guidelines for addressing Technology Transfer (TT) issues	Level of impact / How likely would this action help with TT?					Space for additional comments
		1 (low)	2	3	4	5 (high)	
Research government	Lobby national research governance to change research evaluation emphasis from metrics to a more holistic understanding of research competence and impact.						
	Lobby to simplify procedures and reduce bureaucracy in the implementation of research projects.						
	Lobby to simplify the public procurement process.						
	Provide funding options to cover expenses for the first years of a research spin-out (e.g., 50k-100k grants to cover salary and R&D).						
	Provide more competitive translational grants and innovation competitions to support technology development across TRL 4-6 ('Valley of Death').						
	Active engagement with policymakers and civil servants to increase their awareness about opportunities and challenges for increasing Technology transfer.						

	Active engagement and lobbying with policymakers to develop appropriate legislation to support and promote TT activities.						
	<i>Any additional suggestions, or comments?</i>						
TTO	National support mechanisms to refinance expenses on the patenting process and establish spin-offs.						
	Networking and relationship-building activities to increase the institutional network to reach out for TT activities (e.g., collaborations, professionals to approach for potential spin-out formation).						
	Forming a national association of TTO practitioners to unite national Technology Transfer Offices and lobby the decision-makers and exchange experiences and best practices						
	Promotion of professional development ² of TT managers: taking part in TTO professional networks; and attending training events and conferences.						
	<i>Any additional suggestions, or comments?</i>						
Innovation ecosystem	TTO to organize events with members of the innovation ecosystem to increase their knowledge about ongoing research and TT.						
	<i>Any additional suggestions, or comments?</i>						
Industry	Joint intersectoral PhD student schemes to establish long-term relationships with industry members (also a potential future employer of the PhD student).						

² In addition to technical know-how, TT practitioners must have a variety of soft skills: self-knowledge and emotional intelligence, leadership and teamwork, negotiation, intercultural understanding and communication, problem solving & strategic decision making.

	Organise industry-focused events, such as “Reverse pitching”. Invite industry members to come and pitch what are their problems and what they need, to see if we have any points of contact for collaboration.						
	Promoting internship schemes or collaborative research between academia and industry						
	<i>Any additional suggestions, or comments?</i>						
Academia	TTO to organize events to share TT experiences with academia to increase TT knowledge among academia.						
	Proactive relationship building (including 1-on-1 meetings) between TT managers and academics to increase knowledge of TT among academia and scout for early signs of ideas with commercial potential.						
	Establish a workflow, which promotes patenting discussions before publication preparation.						
	Accept that not every academic should engage with TT and prioritize work with those who are more open-minded.						
	Excellent research is crucial for valorization. Promote the formation of collaborative research clusters along identified excellence areas.						
	Continuous education about confidentiality and intentional research communication to avoid accidental disclosure of invention before patenting.						
	<i>Any additional suggestions, or comments?</i>						