



Report on the evaluation of the Department of Cancer Research (DoCR) at the Luxembourg Institute of Health (LIH)

**Based on a peer review as commissioned by the Ministry of
Higher Education and Research of Luxembourg**

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1. Introduction

The Ministry of Higher Education and Research (MESR) of Luxembourg mandated *Interface Policy studies Research Consulting*, Switzerland, to organise and lead a research evaluation of the Centres de Recherche Publics (CRP).

The Grand Duchy of Luxembourg operates three non-university public research and technology institutions. They are the Luxembourg Institute of Science and Technology (LIST), the Luxembourg Institute of Health (LIH) and the Luxembourg Institute of Socio-Economic Research (LISER). The three CRPs include research departments linked to different scientific disciplines. The evaluation focused on the research performance of the CRPs' research departments.

The research evaluation was conducted in 2022 and followed two earlier evaluations carried out in 2012 and 2018.¹ This report presents the evaluation of the Department of Cancer Research (DoCR) at LIH.

The observations and recommendations presented in this report are based on a peer review by the following three experts working in the departments' research fields:

- Dr. Rolf Apweiler, Director of EMBL's European Bioinformatics Institute (EMBL-EBI), United Kingdom
- Prof. Dr. Eric Solary, Professor at Paris-Saclay University and Physician Scientist at Gustave Roussy Cancer Center, France
- Dr. Franck Perez, Research Director Cell Biology and Cancer Unit CNRS, Institut Curie, France

The peer review consisted of a self-assessment report written by DoCR and a hearing at the department that took place in August and September 2022. The assessment period runs from 2018 to 2021. The hearing, which was organised and moderated by Interface, comprised a presentation by the department, a group discussion of the self-assessment report and several individual and group interviews. These included interviews with the Head of department, research team leaders, members of the wider research staff and PhD students as well as clients and business partners. The report was finalised by Andreas Balthasar and Stefan Essig of Interface.

¹ Between 2010 and 2012, evaluations of selected departments of the former CRPs were carried out. The first full evaluation of the CRPs, which included all departments, was carried out in 2018.

The overall results of all departmental evaluations are summarised in an institute report for each CRP² and a synthesis report³. The institute report includes an assessment of the CRPs as a whole. It also summarises the findings from additional governance interviews with representatives of the management teams at the CRPs as well as a comparison between the CRPs and a foreign benchmark institute.

The report is structured into two parts: the first part discusses in detail the observations gathered by the expert team during the evaluation process. This part will focus on the input, output and outcome/impact of the research department:

- *Input* includes the preconditions for the research conducted, such as strategies, financial and human resources, infrastructure, organisation and external research, industry and other collaborations.
- *Output* includes the performance of the research department, exemplified through research and innovation results and their dissemination.
- *Outcome and impact* refer to the medium- and long-term effects as well as the relevance of the output on science, society, economy, and public administration/politics.

The second part presents the expert team's overall assessment and recommendations for further developing existing strengths and overcoming observed weaknesses.

² Grosjean, Nicolas; Balthasar, Andreas; Essig, Stefan (2023): Report on the evaluation the Luxembourg Institute of Health (LIH), Interface Policy studies Research Consulting, Lucerne and Lausanne.

³ Rieder, Stefan; Balthasar, Andreas; Haefeli, Ueli; Grosjean, Nicolas; Büchler, Chiara; Essig, Stefan; Thorshaug, Kristin (2023): Synthesis report on the evaluation of the Centres de Recherche Publics (CRP) in Luxembourg, Interface Policy studies Research Consulting, Lucerne and Lausanne.

2. Detailed results of the evaluation

2.1 Description of the research department

DoCR was created in 2014 under the name of Department of Oncology (DONC). During the evaluation period, the department underwent several organisational restructurings. DoCR's current director was appointed in 2019. DoCR is structured into administrative support, platforms, and twelve research groups. DoCR's research is focused on immunoncology, neuro-oncology and tumour microenvironment, working with preclinical/animal model systems and advanced imaging technologies. The activities of the department span fundamental, translational, and transversal research.

2.2 Input

2.2.1 Strategy of the department

The experts assessed the strategy of DoCR as positive. DoCR says that, during this evaluation period, the focus of the strategy has moved from mechanistic, single lab-driven research to more collaborative and translational cancer research with the potential for a direct impact on patient care. In doing so, the department has embraced the translational strategy of LIH. The experts considered this translational shift to be crucial and well thought through. Furthermore, the experts observed that the Head of DoCR has been a strong and accessible leader who is recognised by everybody, managing the department with a clear vision and clear communication on DoCR's strengths and weaknesses.

The experts identified the challenge that clinical activities and research are disconnected, which contradicts DoCR's translational strategy. This became visible as:

- interactions between physicians, researchers, and industry partners are weak,
- training opportunities for physicians in clinical research and cancer biology are missing,
- the participation of physicians in translational research is not attractive,
- there are legal barriers to collaboration between the hospitals and researchers,
- health records are neither digital nor connected.

The COVID-19 pandemic had a major impact on the execution of the department strategy. DoCR stayed focused on its previous work, but the progress of several projects was seriously delayed.

2.2.2 Human and financial resources, infrastructure and equipment

The experts determined that the Head of DoCR has developed quite a successful recruitment strategy in a very competitive job market. Recruitment follows a transparent, international process. The presence of many motivated and highly skilled employees shows that the department's human resources are indeed quite strong. DoCR has increased the number of clinician-scientists affiliated with the department. The experts also observed that the working atmosphere at DoCR has been very good. The communication culture within the department is open and supportive. The PhD students, in particular, tell the experts that they are happy with the team, despite significant stressors (see below, *infrastructure and equipment*).

In terms of financial resources, the experts assess that DoCR is a strong department. DoCR has acquired a significant amount of funding from competitive sources and there has been

increased submission of and success in grant proposals at the European level. DoCR's activities were funded by the state block grant and third-party sources coming from competitive calls and contract research. In 2021, third-party financing was around 3.2 million euros, 47% of which came from the Luxembourg Fonds National de la Recherche. Other external funding, especially EU funding, has increased significantly during the evaluation period, yet the department is aware that this needs further improvement, especially in order to acquire ERC fellowships.

In terms of human and financial resources, the experts identified the following challenges:

- Recruitment at DoCR and LIH is challenging for incoming PIs, especially female PIs. Furthermore, the network of previous DoCR employees has not been exploited.
- The director of DoCR is lacking a strategic budget for infrastructure and people to support the agility of the department and the vision of the director.

Infrastructure and equipment were identified by the experts as the most important challenges to DoCR, in particular the department's lack of functioning workspace. This became visible as:

- the lab facilities in DoCR's new building are far from being usable. The uncertainty is a major threat, potentially leading to the loss of momentum for years, creating undue stress on PhD students and postdocs, and impeding international research competitiveness,
- the shutdown of the animal facility has significantly impeded many research projects,
- it is already apparent that the allocated space for DoCR in the new building does not fit with the strategy of LIH and DoCR,
- in general, the infrastructure relevant to DoCR is too widely dispersed throughout the country, making collaborations unnecessarily difficult and interdisciplinary project work inefficient.

2.2.3 Organisation

The experts recognise a clear organisational structure. The structure has changed during the evaluation period, with some research groups and platforms being discontinued and some having started. The department is also unique in having added five junior group leaders. The director stresses that the structure is agile and flat with a lean governance and clear rules for team evaluation and budget allocation. The structures support collaboration within DoCR and the staff is mostly fine with the defined roles and responsibilities. Regular meetings and retreats are held to encourage collaboration. Committees supervising and guiding the researchers and their projects are well accepted.

The education of PhD students, in conjunction with the University of Luxembourg, is well organised, especially since structured PhD programs were implemented. There are also mentoring and PhD committees in place, as well as possibilities to present work, and attend seminars and conferences.

The experts identified the following challenge:

- Training in technology transfer, intellectual property (IP), and start-up creation is lacking, the detection and transfer of innovation is not systematically done.

2.2.4 External collaboration and service provision

The experts are of the opinion that DoCR has been innovative and well connected to stakeholders in Europe, creating new research initiatives that are continually aligned with

national politics. The international visibility of DoCR is increasing; in Luxembourg, DoCR is the “centre of gravity” for cancer research.

DoCR fosters collaboration with hospitals in Luxembourg and more and more public-private partnerships are being built. The department has collaborated with the National Cancer Institute in policy development. The Plan National Cancer shows that the stakeholders want to work together and initiate a positive change. Contacts and common projects have increased despite a regulatory framework which makes collaboration very difficult (see 3.2.1, *strategy*).

The connection to the University of Luxembourg was documented by DoCR with staff members being active as lecturers in the Masters programs, the PhD school and the Medical School.

During the COVID-19 pandemic, there was an almost complete lack of structured exchange when lectures and international conferences were cancelled. Virtual events were not able to completely replace these events. On the other hand, online technologies allowed simple participation in multiple virtual events within Luxembourg and abroad. DoCR also managed to successfully organise a lecture series in cancer research.

2.3 Research output

2.3.1 Quality of output

The experts assessed DoCR’s quality of output as excellent. The experts valued the standards of the publications and they fulfil the state of the art of the discipline. The topics of the publications are also well aligned with the strategy of the department. DoCR appears rather stable in terms of research area and topic development. According to the bibliometric analysis, research in the field of “Glioblastoma subtyping” is very important across the evaluation period. The topic “Immunity in chronic lymphocytic leukemia” over time develops to the most prominent research topic. Overall, research areas appear to be rather separated and independent tracks with independent literature. Yet, all contributed jointly to the department’s topics.

The bibliometric analysis shows that DoCR produced research with an above-average field-weighted citation index (FWCI) of 2.28. According to the analysis, the trend of the FWCI was negative over the evaluation period, but preliminary 2021 results indicate a return to initially very high citation impact. Out of all publications, 18.0% were among the 10% most-cited publications of the scientific field, and 49.3% were published in the 10% top journals. These numbers were high yet with a slightly negative trend. DoCR’s researchers are co-authors of papers published in the highest level journals and the quality and impact factor of journals in which they publish as first, last and corresponding authors has been increasing with time.

Other innovative output that the experts valued were scientific events as well as DoCR’s knowledge and technology transfer activities. Furthermore, DoCR’s members received several awards for their work.

2.3.2 Quantity of output

The experts also assessed DoCR’s quantity of output as excellent, totalling 228 publications. Considering the size of the department, this number impressed the experts. Two patents were recently submitted. The department also produced a substantial number of commissioned reports and books/book chapters.

The COVID-19 pandemic did not have a significant impact on the productivity of DoCR in terms of published peer-reviewed articles; the number of publications per FTE remained quite stable. However, the output in terms of conference abstracts plummeted during the pandemic. In 2021 this started to recover.

2.4 Outcome and Impact

Of importance to the experts is the fact that the impact of DoCR on society is increasing. DoCR plays a key role in shaping national policy and promotes patient-centred cancer research in Luxembourg. The department also engages in events with cancer charities and patient organisations. The experts are of the opinion that DoCR's societal impact has the potential to grow, with new patient stratification methods and options for cancer treatment in development. Upcoming large-scale projects, in particular, can have a meaningful impact.

In terms of scientific impact, the experts stress that DoCR recorded high-quality publications and successfully trained many PhD students and postdocs. This is especially important in the context of an increasingly demanding job market in Luxembourg and the Greater Region.

In terms of economic impact, DoCR promotes interactions with the private sector. DoCR wants to be an interesting cooperation partner for companies at both national and international levels.

3. Overall assessment and recommendations

3.1 Overall assessment of the department

The experts have been impressed by the progress of DoCR over the past four years. DoCR is on the path to becoming an outstanding department. The Head of DoCR has been a strong and accessible leader. The experts assessed that DoCR's quality and quantity of output has been excellent. The impact of DoCR on research and society is increasing. Furthermore, DoCR has been innovative and well connected to stakeholders in Europe. DoCR has acquired a significant amount of funding from competitive sources, and its submissions of and successes with grant proposals at the European level have increased. The experts also determined that the working atmosphere at DoCR has been generally very good and that the Head of DoCR has developed a successful recruitment strategy. The education of PhD students is well organised. Furthermore, the recommendations raised in the last evaluation have generally been well implemented.

Nevertheless, the evaluation detected some challenges. Most importantly, the experts found that DoCR lacks functioning workspace. DoCR's translational strategy is crucial and well thought through, but clinical activities and research are disconnected. The experts are of the opinion that the director of DoCR is lacking a strategic budget. Furthermore, recruitment at DoCR and LIH is challenging for incoming PIs, especially female PIs, and networks of previous DoCR employees have not been exploited. Finally, training in technology transfer, IP, and start-up creation is missing, and the detection and transfer of innovation is not systematically done.

3.2 Recommendations

Based on the observations stated above and in the previous chapters, the expert team formulated the following recommendations (any aspects which concern LIH as well as DoCR are also reported in the institute report for LIH):

I Recommendation 1: Build infrastructure

DoCR urgently needs a functioning workspace. The experts recommend that the ministries in charge act on the following four points:

- Firstly, a quick response is needed to finish the necessary installations onsite in order to allow DoCR's employees to go back to the bench as soon as possible.
- Second priority is the expansion of DoCR's animal facility (cage space, experimental lab, technician positions). The animal facility also plays a crucial role in the anticipated translational activities of DoCR.
- Thirdly, additional lab, office and meeting space must be provided.
- Finally, the long-term plan must be a consolidation of the infrastructure, bringing together all the activities of DoCR, and ultimately LIH, the entire life science/biomedical research and possibly the hospital, in proximity on one campus.

I Recommendation 2: Facilitate further translational research

DoCR's translational strategy is crucial and well thought through. To make the translational strategy of DoCR successful, the experts recommend that the Ministry of Higher Education and Research, the Ministry of Health, and the Ministry of Social Security create a master plan to build a bridge and avoid a disconnection between clinical activities and research. Important aspects of this plan would be:

- intensifying the interaction between physicians, researchers, and industry partners,
- offering training opportunities for physicians in clinical research and cancer biology,
- incentivising the participation of physicians in translational research, for example by building an MD-PhD track and offering protected research time,
- removing legal barriers to collaboration between the hospitals and researchers, especially for the collection and analysis of patient samples,
- introducing interoperable digital health records,
- supporting current plans for national cancer research initiatives,
- implementing everything necessary to be recognised as a Comprehensive Cancer Centre or Infrastructure in the context of the new European initiative on this matter.

I Recommendation 3: Allocate strategic budget

The experts recommend that the LIH provides a budget to the director of DoCR for strategic investments in infrastructure and people to support the agility of the department and the vision of the director.

I Recommendation 4: Enhance workforce and attractiveness

The experts recommend that DoCR, and LIH as a whole, invest more into sustaining and expanding their workforce:

- DoCR and LIH should create more positions for young PIs in competitive calls open to external and internal candidates. The call should include an installation package for incoming PIs and could be used to improve the gender balance amongst PIs.
- Furthermore, recruitment and networks at DoCR should be improved by building an alumni network to inspire the younger generations and to shine more light on DoCR.

I Recommendation 5: Improve technology transfer

The experts recommend that DoCR, in collaboration with the technology transfer office of LIH, incubators and the university should:

- improve training in technology transfer, IP, and start-up creation,
- improve the detection and transfer of innovation, e.g. by scouting for potential innovations and patents,
- participate in targeted calls for technology transfer funding.

Appendix: Agenda of hearing

Wednesday, 31 August 2022			
1 15:45 – 16:45 Welcome address by the Ministry of Higher Education and Research (MESR)		MESR	
16:45 – 17:00 Break		DoCR Evaluation team	
2 17:00 – 18:00 Presentation by the Department of Cancer Research (DoCR)		DoCR Evaluation team	
Time	#	Function/institution of participants	
17:00 – 18:00	1	Head of the Department	
	2	Departmental project manager	
	3	Research group leader	
	4	Research group leader	
	5	Research group leader	
	6	CEO LIH	
18:00 – 20:00	Discussion of self-assessment report and preparation of interviews		Evaluation team
Tuesday, 6 September 2022			
3 8:00 – 09:30 Questions and discussion on the self-assessment report		DoCR Evaluation team	
Time	#	Function/institution of participants	
8:30 – 10:00	1	Head of the Department	
	2	Research group leader	
	3	Research group leader	
	4	Research group leader	
	5	Departmental project manager	
9:30 – 10:00 Break			
4 10:00 – 12:15, 13:30 – 15:10 Individual interviews		DoCR Evaluation team DoCR Evaluation team	
Time	#	Function/institution of participants	
10:00 – 10:30	1	Head of the Department	
10:35– 11:05	2	Senior Researcher	

11:10 – 11:40	3	Senior Researcher	
11:45 – 12:15	3	Senior Researcher	
12:15 – 13:30 <i>Lunch Break</i>			
13:30 – 14:00	4	Senior Researcher	
14:05 – 14:35	5	Junior Researcher	
14:40 – 15:10	6	Junior Researcher	
15:10 – 15:30 <i>Break</i>			
5 15:30 – 17:15 Group discussions with clients/business partners (group 1) and researchers (group 2)			DoCR
			Evaluation team
Time	#	Function/institution of participants	
15:30 – 16:15	1	Centre Hospitalier de Luxembourg & Institut national du cancer (INC)	
	2	Centre Hospitalier de Luxembourg & National Cancer Plan (PNC2)	
	3	Institut national du cancer (INC)	
16:15 – 16:30 <i>Break</i>			
16:30 – 17:15	1	PhD Student	
	2	PhD Student	
	3	PhD Student	
From 17:15	Discussion of results and report writing		Evaluation team
6 17:30 – 18:15 Visit to laboratories and other infrastructure			Evaluation team DoCR
Wednesday, 7. September 2022			
7 8:30 – 12:00 Discussion of results and report writing			Evaluation team
8 12:00 – 12:30 Presentation of results			MESR DoCR Evaluation team