

# CRUK Convergence Science Centre | Development Fund Guidelines

## 1. Overview of the Development Fund

**Developing new technologies, methodologies, and tools** to address urgent unmet clinical needs in cancer healthcare and to solve intractable cancer problems is the key focus of the CRUK Convergence Science Centre. The Development Fund aims to promote novel research at the convergence of engineering, physical and data sciences with biological and clinical research. Awards of up to **£50K** for a 12-month period are available to support the development of preliminary data required to build a more substantive project that could attract investment from external sources, for example the [CRUK Multidisciplinary Project Award](#).

## 2.0 Development Fund Call Remit

Applications will be accepted in any area of **cancer-related tools, technologies and methodologies spanning prevention, detection, diagnosis, and treatment as outlined in the Centre's priority list**. Applicants must clearly articulate the clinical and/or biological question that will be addressed and the need for novel engineering and physical sciences (EPS) approaches to address them. Applications must utilise a convergence science approach. Convergence science is a unique approach to solve vexing research problems, especially those focusing on societal needs, or in the case of cancer research, unmet clinical needs. The focus of the CRUK Convergence Science Centre is to merge EPS and cancer research expertise to develop **new technologies, methodologies and tools** that directly put cancer patient wellbeing at the centre of their design. While the Centre may choose to support basic research projects, the emphasis must be on clinical translation. To support researchers in finding whether their project ideas fit within the remit of this call and find collaborators, the **Centre offers advice** in the form of consultations that are freely available by completing this [request form](#). Please note that this service is only advisory and is only meant to help build convergence collaborations and projects. It is independent from our funding decision pipeline.

Priority will be given to the development of innovative cancer technologies, methodologies, and tools. Cross-institutional applications are highly recommended.

### **Projects must align to the Centre's strategic priorities as follows:**

**Interventional Science:** This theme aims to deliver improvements in surgery, radiotherapy, novel localised therapies, and innovations to monitor therapeutic efficacy. This will be achieved through improvements in the precision of cancer detection and diagnosis and in treatment planning, delivery, and response monitoring at specific phases of the patient journey (Figure 1).

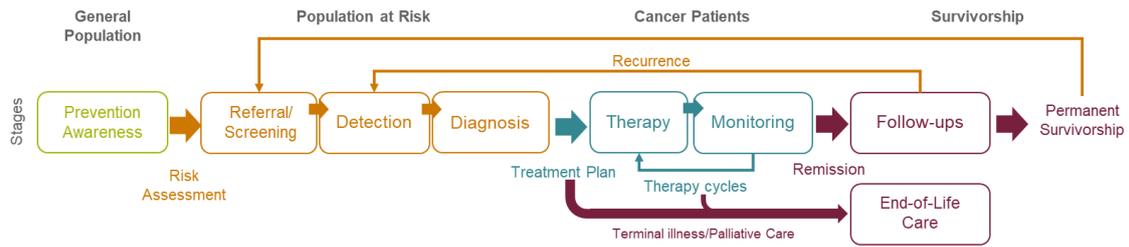


Figure 1: The patient journey

- Early Detection/Earlier Diagnosis:** The Centre will be looking for projects aligning biomarker research with detection technologies that offer substantial advantages compared to existing solutions. Additionally, as more and more patients will be referred as a consequence of cancer detection, the Centre wishes to support technologies, methodologies and tools that address patient stratification (e.g., targeted population, prevention strategies, rapid diagnosis pipelines), diagnosis refinement (e.g., specificity/sensitivity, coupling to imaging technologies, staging), and triage and treatment decisions. Technologies addressing the early detection of cancer recurrence would also be highly valuable.
- Improved and novel therapies:** Surgery and radiotherapy remain the most important curative option for most solid malignancies. The Centre wishes to continue to support surgical and radiotherapy technological innovations to improve cancer patient treatment. The Centre will also be assessing novel therapies, image-guided interventions and methodologies and tools for treatment decision. The Centre will not support novel medicinal products or drug discovery projects if there is no innovative technological or methodological component.
- Therapy and care monitoring:** The Centre will be looking for monitoring technologies. This includes devices that can be used directly during therapy to assess the precision of the intervention and/or the immediate response to the treatment as well as devices monitoring the medium to long term response to therapy, particularly technologies usable at home, preventing therapy failure, rehospitalisation and relapses or improving the patient wellbeing and quality of life.

**Identification and exploitation of cancer’s vulnerabilities:** This theme is focused on enhancing our understanding of cancer biology and translating this into patient benefit through transformative, proof-of-concept, investigator-initiated clinical trials (Figure 2). Projects supported by the Development Fund will enhance the translational pathway by providing new methodologies to address clinically relevant questions and interrogate patient materials.

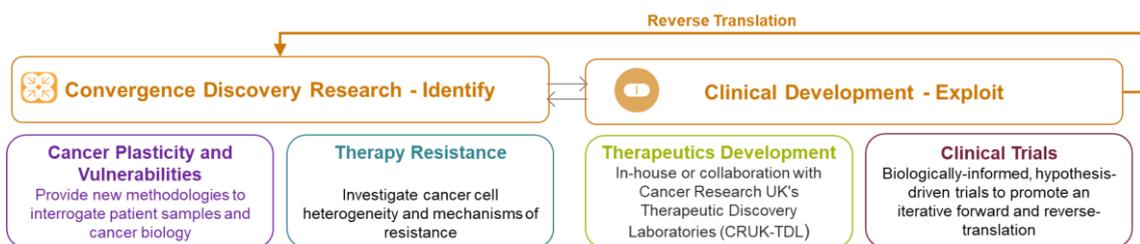


Figure 2: Identification and exploitation of cancer’s vulnerabilities

- **Cancer biology:** The Centre will consider novel technologies, methodologies and tools applied to the exploration of early cancer biology, cancer emergence, adaptation, response to treatment, resistance, metastasis, and recurrence.
- **3D patient-derived model:** The Centre has a focus on the development of 3D patient-derived model, especially in cancers of unmet needs. This is supported by our [human organoid facility & biobank](#). This includes technologies, methodologies, and tools to improve organoid derivation and growth, establish novel co-cultures methods to recapitulate the tumour microenvironment, and enhance the experimental scale and throughput of organoids.
- **Reverse translation:** The Centre will be looking for methodologies and tools that use clinical trials data and materials to inform and enable discovery research. The Centre will not support drug discovery projects if there is no innovative technological or methodological component.

Additionally, **data science and digital pathology underpin both themes**. We wish to see the development of novel data analytic approaches, high content analysis capabilities, medical image analysis and multi-modal data integration. Digital pathology provides the necessary foundations for biological and clinical research and supports device development. We wish to support technologies, methodologies and tools that can aid patient stratification and the development of predictive response markers.

**Please refer to which priority you wish to address in your application.**

### 3.0 Eligibility

- Applications are open to researchers that can confirm that they have access to space, staff, and equipment to undertake the study and that their contract allows them to undertake an independent research project. Research teams are highly encouraged to comprise of collaborating applicants from ICR and Imperial
- Applications should typically be led by researchers from different disciplines, and while the collaborative teams do not need to be newly formed, the project needs to be new. Lead applicants will be expected to have equal intellectual input into the design and delivery of the study and will be given equal recognition for the project.
- Applications are particularly encouraged from newly independent investigators to enable the development of preliminary data to support future applications for funding. The inclusion of early career researchers as collaborators is also highly encouraged.

### 4.0 How the proposals will be assessed

In addition to the eligibility criteria, successful applications must:

- Align to the Centre strategic priorities (see 2.0).
- Use a convergence science approach
- Demonstrate high scientific and technological quality by highlighting the following:

- Importance of the question to be addressed in cancer.
- Quality of the science proposed – with sufficient experimental detail across all disciplines involved.
- Need for a convergence science approach to address the problem and alignment with the Centre strategic priorities.
- Novelty of the proposed approach – i.e., that this is a new approach being developed to address the question, not the application of existing methodology. Where existing methodologies and technologies will be applied, the application must articulate why and how they will be adapted to address the question under investigation.
- Strength of the team – i.e., there is a clear rationale for input from complementary disciplines
- Future plans to develop the project – highlighting how this funding will provide the necessary preliminary data to make the project competitive for external funding. The schemes you are intending to target should be identified.

The applications are highly encouraged to:

- Focus on novel tools, technologies or methods aligned to biological/medical questions, although new applications of existing technologies or methods to poorly explored problematics will also be considered
- Be cross-institutional with leads from each institutions or list additional collaborators from other institutions
- Include newly independent investigators as lead applicants or early career researchers as collaborators

Finally, although it is not mandatory, additional considerations will be given to applications that:

- Address the benefit for cancer patients
- Include a public and patient involvement and engagement (PPIE) plan
- Make use of [dissemination and implementation science](#) to address human factors and health economics requirement for clinical adoption
- Make use of the Centre's [infrastructure](#).

The applications will be reviewed by the Research Subcommittee of the Centre, which comprises equal membership from ICR and Imperial and reflects convergence science expertise. The Subcommittee may also seek additional internal peer review when assessing applications.

## 5.0 Guidelines for completing the application form

Applicants should complete all the relevant sections of the form.

1) **Project title:** Please provide a title describing the project, up to 20 words.

2) **Applicant details:** Please provide the names, departments and contact details for the lead applicants. Applications are expected to have two lead applicants from distinct disciplines. Further co-investigators can be added, but only those who are essential to the delivery of the project should be included.

- 3) **Aims and objectives:** Up to 150 words. Please provide an overview of the question you wish to address and an overview of the approach you will take to address it.
- 4) **Background and rationale:** Up to 250 words. This section is to highlight the background to the research
- 5) **Workplan:** Up to 750 words. This section is to provide an overview of the experimental plan and should indicate how the different teams will work together to achieve the initial aims of the study. Please list the staff members that will carry out the research. Within this section you should indicate what preliminary data you hope to gather and why this is key to supporting the onward progression of the project. We allow one additional side of A4 for figures and brief captions.
- 6) **Potential outcomes and future directions:** Up to 150 words. This section should briefly outline the key outputs from the project and highlight how the outcomes of the Development Fund project will align with external funding schemes.
- 7) **Potential benefits for cancer patients:** Up to 150 words. This section should briefly outline the benefits the research could bring to the real-world clinic and patients' quality of life.
- 8) **Public and patient involvement and engagement plan:** Up to 150 words. This section should outline future PPIE plans that can include how you would envisage:
- Involvement where members of the public are actively involved in the design and conduct of research.
  - Engagement, which regards public facing communication about your research.
  - Participation, when members of the public take part in a research study
- 9) **Finances:** Applicants can request up to £50k for the project, which can be used to support salaries (not recruitment), running expenses and up to £5k for equipment. Brief details of proposed expenditure under each of these headings is required. Please note that the award does not cover overheads. Please include the ICR budget proforma and Imperial draft Worktribe costings with your submission.
- 10) **Animal licences:** Please indicate whether the project will use animals and the status of the Home Office licence.
- 11) **Ethics:** Please indicate whether ethical approval is required for this project and the status of any ethics applications.
- 12) **Dissemination and Implementation plan:** Up to 150 words. Implementation science is the study of methods that influence the integration of evidence-based interventions into practice settings. Dissemination is the process of spreading knowledge and information to these settings. The Centre provides [expertise](#) to help you with the adoption of your tools, technologies methods and biomarker platforms in the real-world clinical practice. This section is meant to indicate whether this aspect has been explored.

## CRUK Convergence Science Centre | Development Fund Application Form

<b>1. Project Title</b>

<b>2. Applicant Details</b> (Please include name, department and contact details)		
<b>ICR Applicant</b>	<b>Imperial Applicant</b>	<b>Applicant 3</b> (optional)

<b>3. Aims and objectives (150 words max)</b>

<b>4. Background and rationale for a convergence approach (250 words max)</b>

<b>5. Work plan (750 words max)</b>

<b>6. Potential outcomes and future directions (150 words max)</b>

<b>7. Potential benefits for cancer patients (150 words max)</b>

<b>8. Public and patient involvement and engagement plan (150 words max)</b>

<b>9. Financial request</b> – Please attach the Imperial draft InfoEd and ICR budget proforma. Applications will not be accepted without these documents		
<b>Category</b>	<b>Detail (including institution)</b>	<b>Cost (£)</b>
Salaries		
Running Expenses		
Equipment		
	<b>TOTAL</b>	

<b>10. Home Office licence(s)</b>

Not required	Please give reason (e.g., <i>does not involve animal studies</i> ):
Application in progress	Please state status:
Licence(s) obtained	Please give relevant project and personal licence references:

<b>11. Ethics</b>	
Not required	Please give reason (e.g., <i>does not involve human material</i> ):
Application in progress	Please state status:
Ethics (REC) obtained	Please give relevant REC project title and reference number:

<b>12. Dissemination and Implementation plan (Optional, 150 words max)</b>

### 13. Approval of Heads of Department/Division

**Please join a letter or email of support from HoD to be submitted with the application.**

**Please check here to confirm that all investigators agree to participate in Patient Involvement and Outreach activities**

For help with this application, please contact Dr Arnaud Legrand ([arnaud.legrand@icr.ac.uk](mailto:arnaud.legrand@icr.ac.uk)/[a.legrand@imperial.ac.uk](mailto:a.legrand@imperial.ac.uk)).

Submissions should be emailed to [icr-imperial-convergence.centre@imperial.ac.uk](mailto:icr-imperial-convergence.centre@imperial.ac.uk) by 5pm on the 3rd of February 2023. Late submissions will not be accepted.