1. ACED EARLY CAREER PATHWAY AWARD

ACED Early Career Pathway Awards act as a springboard for early-career researchers establishing independence by funding exceptional science and driving forward a transformational change in how and when cancer is detected through collaborative research. This postdoctoral award aims to help researchers expand their multidisciplinary skills, providing opportunities to obtain mentorship with eminent researchers in the field, and to obtain preliminary data for future independent fellowship applications. This is a career development award with a longer-term view to building the recipient's independent research career in early detection research.

Submit completed applications to the local ACED Programme Manager (Section 3: Useful Contacts) in Word format by the deadline date.

1.1. SUMMARY OF AWARD

Amount: If applying on a full-time basis, this Award can be used to fund the Applicant's salary (commensurate with current career stage at the host ACED Member Centre). In addition, up to £50,000/year or $70,000/year for research (including any annual salary increments), training and travel expenses (along with appropriate justifications) can be included up to a maximum total of £210,000 / $270,000.

Eligibility: Applicants must have a PhD or be about to complete a PhD (or equivalent higher research degree, such as a professional doctorate) and must be based at one of the following institutions: Canary Center at Stanford University, the University of Cambridge, the OHSU Knight Cancer Institute, University College London or The University of Manchester. Before applying, **please check with the local ACED Programme Manager to ensure Co-Mentors are named Alliance Members at their host institution.** For UK Applicants, please note that this Award supports individuals requesting their full salary and cannot be considered in junction with other sources; this Award should be the Applicant's sole salary source during the award period. Please see Section 1.3 for more details around eligibility.

Scope: The proposal must be within the scientific remit of the Alliance.

Award duration: 24-months full-time. For UK Applicants, Awards can be held part-time as per guidance in section 1.3.

Restrictions: Applicants are strongly encouraged to develop their multidisciplinary skills through this Award, including in a complementary yet distinct research area to their own background, either through collaboration or relevant skills training. Spending time at a different ACED Centre is encouraged but not mandatory. Applicants must receive signed approval from the Member Centre Director where you are submitting your application.

Applicants must have 2 Co-Mentors who are named Alliance Members based at different ACED Member Centres. **One of the Co-Mentors would be the host of the awardee during the majority of the tenure of the award.** It is highly encouraged that one of the Co-Mentors is in a complementary but distinct research area to widen the Applicant's skillset.

It is strongly encouraged that Applicants consider including visiting placements at different ACED Member Centres (where one of their Co-Mentors would be based) to their host Centre as part of their professional development, where personal circumstances permit.

Please submit ONE application in a given round to the Applicant's current ACED Member Centre. Please liaise with the potential Co-Mentors and the local ACED Programme Managers ahead of submission.

1.2. REMIT OF THE ACED PATHWAY AWARD

What is suitable for the ACED Pathway Award?

The goal of this award is to act as a stepping-stone to an application for an independent career development award or fellowship, by developing the Applicant's skillset and research profile. This would in turn support the Alliance's strategic and capacity-building aims in the development of the next cadre of multidisciplinary early detection researchers. Applications for an ACED Pathway Award will be accepted in any number (or combination) of research areas listed in the ACED scientific strategy as long as the application is primary cancer detection-relevant and clearly articulates the cancer-related question you're focusing on.

This award provides 24 months of secured funding support for early career researchers in their pathway to independence in an environment of pioneering early detection research, with a strong focus on mentorship, training, and career support.

Early detection is a diverse research area, spanning from basic biology and technology innovation through to translational and population research. ACED supports work across this pipeline. This could include the development of novel tools, establishing new collaborations and/or original ways of utilising existing technologies and tools in an early detection setting. A clear hypothesis to address an unmet need in the field is essential.

1.3. ELIGIBILITY

Applicants

To be suitable to apply for an ACED Early Career Pathway Award, Applicants should:

- Be a scientist or healthcare worker based at an ACED Member Centre.
- Have a PhD or be about to complete your PhD (or equivalent higher research degree).
- Demonstrate the requisite range of skills and experience as outlined in the 'Develop Independence' career stage in CRUK's Competency Framework. Applicants will be asked to demonstrate relevant skills and experience on the application form.
- Not have previously held a salaried award as a Principal Investigator.

Applicants must have 2 Co-Mentors based at different ACED Member Centres. It is expected that one of the Co-Mentors is in a complementary but distinct research area to widen the Applicant's skillset. Collaboration between US and UK Member Centres is encouraged, but not mandatory.

Applicants must ensure that their host institution will provide sufficient space and access to resources to undertake the proposed research. This should be stated in the Letter of Support from the Co-Mentor based at the same Host Institution as the Applicant.

The Applicant should be prepared to acknowledge and explain any notable career interruptions (e.g. leave of absence, part-time working, change in discipline, etc.) and will not be penalised with respect to advancement, outputs, or status.

For UK Applicants:

You can apply on a flexible working basis:

- ACED is supportive of Applicants applying on a part-time or flexible working basis as long as this fits with the needs of your ACED Member Centre and your request is approved by them;
- As a general rule for ACED Early Career Pathway Award Applicants, we expect at least 0.5 FTE or 80% of your working hours, whichever is greater, to be spent on academic research;
- If you would like to apply on a part-time basis, we advise you to contact your local ACED Programme Manager and the CRUK ACED Programme Manager (Section 3: Useful Contacts) before starting your application to discuss your proposed parameters for the award and how to include the part-time request in your application.

Please note that this Award supports individuals requesting their full salary and cannot be considered in conjunction with other sources. This Award should be the Applicant's sole salary source during the award period

Host institution approval

To be eligible, the Applicant of the Award must be based at one the following institutions: Canary Center at Stanford University, University of Cambridge, OHSU Knight Cancer Institute, University College London or The University of Manchester. Additional collaborators outside these institutions should be named in the 'Collaborative team' section of the application, clearly articulating their contribution to the project. Please note that external collaborators are not eligible for ACED funding and cannot receive funds as part of this project. External collaborators have an obligation to share data with researchers across the ACED Centres; if you are including external collaborators in your application, please discuss this in the first instance with your local ACED Programme Manager.

Your Member Centre Director must approve your application before you have submitted it, so please submit your completed application to your local ACED Programme Manager (Section 3: Useful contacts) before the indicated deadline. Please contact your local ACED Programme Manager for information on required review of finances at your institution. Your proposal should also comply with all appropriate local regulatory, ethical and research governance procedures.

1.1. WHAT IS FUNDED?

ACED Pathways Awards offer 24 months of funding on a full-time basis and can be used to fund the Applicant's salary with some of the associated costs for the award (including lab consumables, data storage/exchange costs, facility access charges etc.) up to a maximum of £210,000 / $270,000. In addition, the research expenses may also be used for training and the associated costs of travel and organisation of meetings between collaborators named on the application. Appropriate justification would be expected as part of the application and any inadmissible or excessive costs would be deducted if the application is successful.

In general, funds requested from both US and UK Applicants should be directed towards direct research and training costs.

Support environment

It is expected that those in recipient of the award would be provided with tailored career development opportunities by their Co-Mentors, which should be clearly outlined in their supporting letters.

1.2. ASSESSMENT CRITERIA

The Alliance Executive Board will judge your proposal on:

- Relevance to Alliance scientific strategy and remit: All applications must be within scope as outlined in the Alliance scientific strategy and advance the understanding of early cancer and improving how and when cancer is detected. An abbreviated Alliance scientific strategy is available to all Alliance members.
- Track record: The Applicant should have appropriate skills and experience relevant to the 'Develop Independence' career stage of CRUK's Competency Framework.
- Vision for career development: The Applicant should outline their ambition/vision for their career with a focus on professional development, including utilising the resources of the Alliance to maximise their learning opportunities. Applicants must have a clear indication of how this Award will support their immediate career plans after completion of the Award.
- Supportive environment: The supporting letters from the Co-Mentors should clearly demonstrate the mentorship and career support plans for the Applicant.
- Scientific excellence, novelty and risk: How would work and training achieved through this award lead to development of novel high-risk research proposals with robust experimental design and include novel and innovative approaches.
- The challenge addressed: What is the unmet research and/or clinical need which the proposal would address? How would knowledge be advanced to meet that need?
- Line of sight to clinical/population impact: The proposed work must have the potential for a remarkable impact on cancer detection. Whilst not all applications will be translational in nature, it is important that all research is designed with a clear line of sight to clinical/population impact and the proposal should clearly articulate this pathway and the evidence and outputs that will be required to advance along it. Appropriate consultation/collaboration with clinicians, population scientists, industrial partners, patients and/or the public should be included to facilitate this.
- Excellent team and collaborative environment: All applications should outline the suitability and feasibility of the Applicant to carry out the proposed research with access to the resources, facilities and training required for the successful fulfilment of the award. *Applications should highlight the importance of the Alliance environment in supporting the potential of the proposed research* and address how Alliance partnerships will uniquely enable the proposed research compared to Alliance Member Centres conducting the research independently. Multidisciplinary, transatlantic collaboration is encouraged when appropriate to the science proposed. It is important to demonstrate the added value of the proposed collaboration and the individual contributions, as well as the steps taken to ensure an effective collaboration.
- Resources requested: The costs requested in an application should, in general, be for the direct costs of the research and reasonably justified in line with the experimental plans, leveraging existing resources where appropriate.

- **Benefit to the wider Alliance:** Applications should detail the actual and potential benefits to the wider Alliance community, including any infrastructural benefits, knowledge exchange, data sharing, etc.

Additionally, as part of ACED, CRUK is a **DORA** (San Francisco Declaration on Research Assessment) signatory. As such, ACED is aligned with DORA principles through our commitment to assess the quality and impact of scientific research through means other than journal impact factors. This means that our reviewers will:

- **Consider the value and impact of all research outputs** in addition to research publications (e.g., preprints, training delivered, contribution to consortia, community outreach, patents, key datasets, software, novel assays and reagents etc.).
- Recognise that the **content of a scientific paper** and its influence in the field **holds more significance** than publication metrics or where it was published.

2. THE APPLICATION PROCESS

2.1 PROCESS OVERVIEW

ACED Early Career Pathway Award applications involve the following steps:

1. Complete an 'Intent to Submit' form online, which will be reviewed by your local ACED Programme Manager.

2. If approved, you will be invited to submit an application to the Alliance Executive Board.

3. Applications will be sent for expert peer review within the Alliance, then interviewed and triaged by the ACED Training Working Group.

4. The Alliance Executive Board will review and make the final funding decision.

5. Applicants will be informed of the outcome and final funding decision.

2.2 SKILLS AND EXPERIENCE

When completing Section 3 of the application template, please refer to CRUK's Competency Framework and specify the 'Develop independence' career stage which outlines the range of skills and experience and the types of examples that ACED might expect for an Early Career Pathway Award.

Please use Section 3 of the application template to provide details on the following aspects (no more than 6 pages in total for this section):

- Your research outputs and impact (maximum length 1 page), highlighting 3-5 key achievements relevant to the application;

- Your future research ambitions and your plans for the duration this award;
- Your plans to develop personal and scientific skills and knowledge to drive the development of stated research;
- Your plans to develop your multidisciplinary skills in a complementary yet distinct research area to your own, if applicable;
- Your plans to utilise the resources of ACED to develop stated career plans;
- Brief details on notable career interruptions (e.g. leave of absence, part-time work, change in discipline, etc.), which will be considered and not penalised for when reviewing your track record, outputs and advancement.

2.3 COLLABORATIVE TEAM

Please use Section 4 of the application template to provide details on the following aspects (no more than 2 pages in total for this section):

- Your current research network and highlight how this network contributes to you achieving your own research goals;
- The collaborations you intend to develop during this award and how they will support your research and professional development, including how your communication, engagement, and multidisciplinary skills in early detection research will be developed.
- How the proposed mentorship provided by both Co-Mentors would contribute to the Applicant's training and development.

2.4 RESEARCH PROPOSAL

Following your intent to submit, please use the template provided to complete your research proposal. Section 5 of the application template should not exceed eight standard pages using Arial 10-point font, including figures. References are not included as part of the page restriction. In this section, you should aim to address the content outlined in the table below.

In your research proposal please include:

- How the proposal will help establish your research in the early detection field;
- The vision for your career development and how your proposal would support this;
- The novelty of your idea;
- The multidisciplinary nature of your research proposal and how you will develop multidisciplinary skills during the course of the award;
- The support that would be provided by the Co-Mentors in your career development;
- How would this award support your training, leading to the development of novel high-risk research proposals for independent fellowship applications;
- The strength of your wider collaborative team (beyond the Co-Mentors);
- The downstream translational potential of your idea;
- The clinical need addressed by your idea;
- The contribution to early detection research should the idea be a success;
- Outline any examples of similar and/or competing approaches globally, for the proposed research (e.g. different test to determine the same outcome, different cohorts, etc.);

- If there are commercial collaborators, outline the intellectual engagement and financial investment contributed by the commercial entities, and how this is critical to the proposed research.

Contents of the research proposal

HYPOTHESIS	• Clearly describe the **hypothesis** for your proposed research plans. • Briefly describe the **scientific need** for your proposed work – why is it necessary to test this hypothesis? If your proposal is for discovery research, this is an opportunity to provide context around the **clinical need** and how your results could lead to **impact** for patients. • Describe the significance of the results you plan to obtain. In particular, the relevance of your expected results to detection of cancer – for example, any future clinical applications or impact on policy and practice.
BACKGROUND	• Summarise your current and other published work relating to your research proposal, including the major achievements of your collaborative team over the last 5 years. You might refer to any relevant preprints or datasets in a citable format (e.g. including a unique Digital Object Identifier). • Describe how this knowledge and experience can be integrated to address the goals and hypothesis of the proposed research.
RESEARCH PLAN	We suggest you divide your research plan into objectives. For each objective state: • The research question. • Experimental methods, techniques and analyses that you'll use to test your hypothesis. Refer to your own published work where you've used these methods before or indicate the availability of appropriate expertise. Justify the appropriateness of your experimental design including sample size calculations as appropriate. • Any available unpublished research findings or methodologies supporting your research proposal (please include these in the text, not as an appendix). • Explain clearly how you will address the early detection challenge you have identified. Please provide enough information on how you plan to develop your ideas and build a platform for future research, highlighting the key milestones necessary to achieve this. • Briefly describe what the major achievements of your research will be if successful. Clearly articulate how these outputs could be taken forward along the translational pathway towards earlier detection of cancer in patients. • You also have an opportunity in this section to describe how you plan to involve patients and the public in your research, if relevant.
RESEARCH CAREER PLAN	Please provide information on how this award will support your plans to develop your career in early detection research through: • Scientific training, including how multidisciplinary skills will be developed • Professional and personal development • Support provided by the Co-Mentors, including a mentorship plan • Potential independent fellowship funding routes

COLLABORATIVE ENVIRONMENT	Please provide information on the composition of the wider collaborative research environment: • Individual time contributions of those working on the award where possible, stating briefly the added value of the collaboration compared to each researcher working independently. • Address how the Alliance environment is critical in supporting the potential of the proposed research and how this Alliance partnership will enable the proposed research compared to Alliance Member Centres conducting the research independently.
TIMESCALE AND POTENTIAL PROBLEMS	• Provide a table to indicate milestones and timescales for each part of the plan. • List potential logistic or scientific problems and suggest solutions or alternative plans.
REFERENCES	• Give full details of any references, including authors, publication year, title and journal name, volume, page numbers. We won't accept shortened references. • Number your references in the order in which they appear in the text, and list them in the Vancouver style (as outlined by the US National Library of Medicine).

2.5 ADDITIONAL RESEARCH INFORMATION

Please use the provided template to complete the following sections.

Additional information for all proposals

JUSTIFICATION FOR SUPPORT REQUESTED

Please complete these sections according to the following guidelines. **Costs should be divided and reported separately for each UK and US Member Centre(s) in the local currency of the country in which they are incurred in (e.g. GBP (£) for UK and USD ($) for US).**

Please provide justification on how the research, travel and training expenses would be utilised during the duration of this award.

Description	Additional Information	Costs Year 1	Costs Year 2	Costs Year 3	Costs Total
Data storage (Cambridge)	Storing data from RNAseq and DNAseq data and respective public datasets for subsequent analysis	£0	£3200	£0	Cambridge - £3200

STATISTICAL DESIGN AND ANAYLSIS PLAN	For each research question as appropriate: • Describe the statistical analysis used; • Name the variables and describe the values; • State the numbers of samples you plan to include in each analysis, describing what you can achieve with this number of samples; • Include (where appropriate) the associated level of statistical power; • Suggest any potential limitations; • Clarify other relevant details (e.g. numbers of events in clinical outcomes, length of follow-up for clinical outcomes).
CELL LINES	Only complete if applicable Please provide details of any cell lines you will use in your research. These should include: • Details of how you will maintain good cell culture practices throughout your award. • If new cell lines will be introduced to your lab, please give the source will be authenticated when they enter your lab. • If new cell lines will be generated, please tell us how these will be made available for others to use. • Justification for the use of any cell lines that have been misidentified (e.g. Chang liver cells). You can request funding (under running expenses) to support cell line authentication (e.g. screening for contamination by mycoplasma, STR profiling for human cell lines or DNA fingerprinting for non-human cells). You'll need to validate your cell lines according to the Guidelines for the use of cell lines in biomedical research (doi:10.1038/bjc.2014.166), which should be referenced in any publications resulting from the award.
ANIMAL STUDIES	Only complete if applicable You should complete this section if you are proposing to use animals in your research. You should ensure you are familiar with the relevant NC3Rs guidelines, in particular the Responsibility in the Use of Animals in Bioscience Research document, the ARRIVE Guidelines, and the NC3Rs Guidelines: Primate Accommodation, Care and Use. When completing this section, you should describe how your proposed research adheres to the expectations set out in these guidelines. Animal Costs: • Please include a full breakdown of the purchase costs and husbandry costs (e.g. per mouse per week). • Please list animal purchase, maintenance and experimental costs separately. Justification of proposed animal studies Please briefly justify the use of animals by outlining: • Why animal research is necessary for your award and details of all species you propose to use; • Why the species/model you have chosen is the most appropriate physiological model to use for the research objective(s); • If you are developing any new models, why this is necessary and how you will ensure that these will be disseminated to the research community more broadly; • The efforts you will take to minimise animal usage.

For your critical experiments, please provide an outline of your experimental design and power calculations. Where details of specific experiments are not known, you may provide an illustrative example. This should include:

- An overview of the experimental approach summarising; primary and secondary experimental outcomes, number of experimental and control groups, the number of experimental units in each experimental group, the total number of experimental units to be measured and the number of times each unit will be measured, number of independent replications of each experiment and how you plan to minimise experimental bias (e.g. randomisation and blinding) or an explanation of why this would not be appropriate.
- An explanation of how effect sizes have been calculated and a justification of their biological relevance
- The power calculations used to determine your sample size (or a principled explanation of an alternative basis for calculations, justifying why you haven't used statistical calculations). Explanations based solely in terms of 'usual practice' or previously published data will not be considered adequate.
- Details of breeding strategies that will be implemented (if applicable).
- A brief description of your planned statistical analyses in relation to the sample size, and list any statistical advice available.
- You may present this in the form of a table or diagram, if appropriate.

Please note that the NC3Rs website includes a number of useful experimental design resources, including the Experimental Design Assistant (EDA), a free online tool to help optimise experimental design. The EDA can be used to create a visual map of your planned experiments (or a few of them) that may be useful in discussions with your team and statistical advisors. If you use the EDA, you are encouraged to submit the EDA report as a PDF upload.

Please note that applications proposing research on specially protected species (cats, dogs, equines or non-human primates) or pigs must undergo an additional independent peer review by the NC3Rs; contact the office as soon as possible (and before the application deadline date) if this is applicable to your proposal.

For any animal studies to be performed outside of the UK, we also require a letter to be included with your completed application from the relevant Applicant leading this work to confirm that the research proposed will adhere to all relevant local regulatory systems, and also that the welfare standards will be consistent with UK standards.

2.4 ADDITIONAL DOCUMENTS

Letter(s) of Support: You must include a brief letter of support from your Co-Mentors as part of your application, clearly demonstrating their commitment to support the Applicant. The Co-Mentor based at the same institution as the Applicant should confirm there is sufficient space and access to resources. Submit any Letters of Support in PDF format, signed, dated and on headed paper alongside your completed application.

2.5 ETHICAL APPROVAL

If you plan to involve patient tissue or patient information in your research, you'll need to get ethical approval. You do not need ethical approval for Patient Involvement activities, however we do expect best practice to be followed (resource: NIHR National Standards on Patient Involvement in Research). It's your and your Host Institution's responsibility to make sure you comply with all legal requirements and ethics approval. We understand that you'll generally need to confirm funding arrangements before you can get ethical approval. Therefore, we can make you a provisional offer of funding, but we may not release any money to you until you've sent us written confirmation of ethical approval. Please bear this in mind when you propose a start date for your award. If you need any other regulatory approval, we may also need written confirmation before we release funding. We will review this on a case-by-case basis).

2.6 PATIENT AND PUBLIC INVOLVEMENT

While we do not mandate inclusion of specific involvement activities as part of your research, if your proposal involves studies utilising patients and the public, their samples or data, we would highly encourage you to include patient and public involvement plans if they can add value to your research proposal.

This could include, but is not limited to, involvement in the development of research questions, planning/design of research, patient recruitment, monitoring progress, evaluation and/or dissemination of research findings. This could also include offering advice as members of a project steering group, commenting on or developing research materials.

You may like to address the following prompt questions when writing about your PPI plans in your application. You are not required to follow this format.

- What is the proposed PPI plan? What is the rationale for the plan?
- How many people are you aiming to involve through the activities set out in your plan? What is their role? How will you recruit them?
- How will you support those who you involve in your research?
- What is the proposed budget required for your PPI plan?

Resources to help you:

CRUK provides details and guidance on how to implement patient and public involvement (PPI) plans, including budgeting and cost guidance in the PPI toolkit for researchers on our website. To request login details to access the toolkit, or for any additional questions regarding patient involvement, please email involvement@cancer.org.uk.

INVOLVE: provides briefing notes on how to involve patients at each stage of the research cycle

NIHR Research Design Service: can offer application specific support and advice on appropriate public and patient involvement methods.

People in Research: can be used to advertise involvement opportunities and recruit people.

NCRI Consumer Liaison Forum: Many forum members also act as patient representatives in their local area or for other national bodies such as the Department of Health or Public Health England.

3. USEFUL CONTACTS

Once you have read these guidelines, please contact karolin.kroese@cancer.org.uk if you have any questions or need more information.

Affiliation	Name	Role	Contact Information
Cancer Research UK	Karolin Kroese	ACED Programme Manager	karolin.kroese@cancer.org.uk
Cambridge	Wendy Alderton	Programme Manager	wa266@cam.ac.uk
University College London	Daniel Kelberman	Programme Manager	d.kelberman@ucl.ac.uk
OHSU	Erin Watson	Programme Manager	watsoner@ohsu.edu
Stanford	Ryan Spitler	Programme Manager	rspitler@stanford.edu
Manchester	Martin Bone	Programme Manager	martin.bone@manchester.ac.uk