



Higher Scientific Officer – Protein production and purification

Candidate Information

January 2024

The Institute of Cancer Research

About our organisation

We are one of the world's most influential cancer research institutes with an outstanding record of achievement dating back more than 100 years. We are world leaders in identifying cancer genes, discovering cancer drugs and developing precision radiotherapy. Together with our hospital partner The Royal Marsden, we are rated in the top four centres for cancer research and treatment worldwide. As well as being a world-class institute, we are a college of the University of London. We came top in the league table of university research quality compiled from the Research Excellence Framework in 2014 and second in 2021. We have charitable status and rely on support from partner organisations, charities, donors and the general public. We have more than 1000 staff and postgraduate students across three sites – in Chelsea and Sutton.

About our Centre

The Centre for Cancer Drug Discovery (CCDD), within the Division of Cancer Therapeutics, is a multidisciplinary 'bench to bedside' centre, comprising around 160 staff dedicated to the discovery and development of novel therapeutics for the treatment of cancer. The CCDD's exciting goal is to discover high quality drug candidates for validated biological targets and to progress these candidates to clinical trial. All the scientific disciplines are in place to make this possible. Our world-class biologists, chemists and drug metabolism specialists work together focusing on new molecular targets emerging from human genome and ground-breaking cell biology research. This is an exciting and fast-moving area of cancer research and offers the opportunity to work within a multi-disciplinary environment using state-of-the-art techniques and equipment.

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About our team

The Hit Discovery and Structural Design Team uses biochemical and biophysical assays to perform small molecule high-throughput screening and fragment-based hit discovery, coupled with X-ray crystallography and electron microscopy to enable structure-based drug design within the CCDD. These methodologies are underpinned by state-of-the-art protein expression, purification and biophysical characterisation capabilities, allowing for the generation of large quantities of high-quality protein targets.

Pertinent to this role, our protein production laboratories are equipped with six state-of-the-art GE Healthcare Akta Pures for protein purification and has the capabilities to produce recombinant proteins in bacteria, insect cells and mammalian cells. The team is also equipped with a broad range of biophysical technologies including DLS (Xtal concepts SpectroLight600), DSF/TSA (Nanotemper Prometheus & Biorad 384-well thermal cyclers), SPR (GE Healthcare T200 & 8K Biacores) and ITC (Malvern MicroCal iTC200). Additionally, we have access to Mass Spectrometry and NMR facilities within the division, used both for sample QC and assays (MS-based assays, ligand- and protein-observed NMR). Our screening laboratory is equipped with a number of HTS multimode plate readers (including two BMG Pherastars) for biochemical/functional target protein characterisation and compound testing. To enable fast and accurate assay preparation, the team possesses a broad range of liquid handling equipment, including various pipetting robots and two Beckman ECHO acoustic dispensing machines integrated onto Access systems for compound dispensing. Last but not least, our crystallisation laboratory is equipped with specialised liquid handling robots (SPT Labtech Mosquito and Dragonfly), coupled with a plate imaging robot (Formulatrix RockImager 1000) to enable fast discovery and optimisation of crystallisation conditions. We also possess a rotating anode X-ray source onsite in Sutton (Rigaku FRX with Pilatus 300K detector) and benefit from very good access to Synchrotron.

You will be joining a team working at the crossroads of the drug discovery activities of the Centre for Cancer Drug Discovery, where scientific excellence and team science are core values. You will be working in close collaboration with colleagues in the fields of biology, medicinal and computational chemistry, structural biology and DMPK. This position will also offer training in new techniques and support will be available for attending training courses and appropriate academic meetings.

Our mission
is to make the
discoveries that
defeat cancer.

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Job description

Department / division: Centre for Cancer Drug Discovery
Division of Cancer Therapeutics

Pay grade / staff group: Higher Scientific Officer

Hours / duration: Full time (35 hours per week), Monday to Friday. Fixed term contract for 2 years

Reports to: Rob van Montfort

Main purpose of the job: The main objectives of the post are to perform protein expression of various constructs and site-directed mutants of early-stage cancer targets in insect cells and *E. coli*, carry out subsequent purification of successfully expressed constructs, characterise the resulting samples using biophysical assays. The post holder will work closely with other biologists, chemists and structural biologists involved in the projects as part of multidisciplinary teams to progress the targets through hit finding and hit optimisation screening campaigns.

Duties and responsibilities:

KEY DUTIES & RESPONSIBILITIES

The post-holder will be laboratory-based at the ICR's Sutton campus, South London and will work in conjunction with multidisciplinary project teams.

Design and sub-clone DNA constructs of one or more cancer targets, truncated variants and/or site directed mutants.

Perform expression of these constructs in insect cells and/or *E. coli* expression systems.

Purify the resulting proteins using AKTA Pure FPLC systems.

Optimise the protein yields to amounts sufficient for biochemical and biophysical characterisation.

Perform biophysical characterisation of the resulting target proteins.

Keep abreast of new findings appropriate to the work and introduce new procedures and technologies to improve workflows on our protein production and biophysical assay platforms.

Take responsibility for the use and maintenance of items of specialised laboratory equipment pertinent to the role.

Ensure that accurate records of all experimental data are maintained in our electronic notebook system and

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the results are captured in our Dotmatics database.

GENERAL DUTIES

Work in a flexible but organised manner to meet objectives/deadlines.

Work and communicate effectively with other members of the group, Project Team, Centre and collaborating organisations/vendors as required.

Prepare reports of results for oral or written presentations at internal and external meetings and for publications.

Ensure that work conforms to the requirements of COSHH, ACGM, Local Rules for Health and Safety and other Codes of Practice as required by the ICR Safety Policy and Centre guidelines.

Initiate purchase of consumables and minor equipment within budgetary limits.

General

All staff must ensure that they familiarise themselves with and adhere to any ICR policies that are relevant to their work and that all personal and sensitive personal data is treated with the utmost confidentiality and in line with the General Data Protection Regulations.

Any other duties that are consistent with the nature and grade of the post that may be required.

To work in accordance with the ICR's Values.

To promote a safe, healthy and fair environment for people to work, where bullying and harassment will not be tolerated.

This job description is a reflection of the present position and is subject to review and alteration in detail and emphasis in the light of future changes or development.

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Person specification

Education and Knowledge

First degree in a biological or physical science	Essential
MSc or PhD in biochemistry or related subject	Desirable
Theoretical knowledge and in-depth practical experience of contemporary protein expression and purification techniques	Essential
Demonstrable knowledge and practical experience of biophysical techniques such as DLS, TSA, ITC and/or SPR	Desirable

Skills

Ability to trouble shoot research work in a timely fashion	Essential
Ability to integrate different experimental techniques into novel strategies	Essential
Good observation skills, attention to detail, ability to keep appropriate records	Essential
Computer literate, able to use e.g. MS Office, web-tools and databases	Essential
Proven ability to organise and prioritise workload to meet deadlines	Essential
Good communication skills and the ability to interact effectively with other team members	Essential
Ability to prepare scientific reports and present data	Essential
Ability to produce work suitable for high-quality, high-impact publications	Essential
Highly self-motivated and enthusiastic, with a keen desire to produce high quality scientific data	Essential

Experience

Experience and demonstrable expertise in protein expression in <i>E. coli</i> and insect cells	Essential
Experience and demonstrable expertise in modern protein purification methods	Essential
Demonstrable skills in molecular biology and construct design	Essential
Experience in biophysical methods such as DLS, TSA, ITC and/or SPR	Desirable
Familiarity with contemporary approaches to drug discovery	Desirable
Experience of performing small molecule screening using biophysical techniques	Desirable

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Benefits

We offer a fantastic working environment, great opportunities for career development and the chance to make a real difference to defeat cancer. We aim to recruit and develop the best – the most outstanding scientists and clinicians, and the most talented professional and administrative staff.

The annual leave entitlement for full time employees is 28 days per annum on joining. This will increase by a further day after 2 years' and 5 years' service.

Staff membership to the Universities Superannuation Scheme (USS) is available. The USS is a defined benefit scheme and provides a highly competitive pension scheme with robust benefits. The rate of contributions is determined by USS and details of the costs and benefits of this scheme can be found on their website. If staff are transferring from the NHS, they can opt to remain members of the NHS Pension Scheme.

We offer a range of family friendly benefits such as flexible working, a parents' group and a maternity mentoring scheme. Other great benefits include interest free loans for discounted season tickets for travel and bicycle purchases, access to the NHS discounts website, a free and confidential Employee Assistance Programme which offers a range of well-being, financial and legal advice services, two staff restaurants, and access to a gym and sporting facilities at our Sutton site.

Further information

You may contact Dr Rob van Montfort and/or Dr Yann-Vaï le Bihan for further information by emailing rob.vanmontfort@icr.ac.uk or yann-vai.lebihan@icr.ac.uk. This job description is a reflection of the current position and is subject to review and alteration in detail and emphasis in the light of future changes or development. Please DO NOT send your application to Dr Rob van Montfort or Dr Yann-Vaï le Bihan, but apply via the e-recruitment system on our website www.icr.ac.uk

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Our values

The ICR has a highly skilled and committed workforce, with a wide variety of roles, each requiring different skills. But whether you work as a researcher, or work as part of our corporate team, your work and behaviour is underpinned by these six values. They are what bring us together as one team - as 'One ICR'.



Pursuing excellence

We aspire to excellence in everything we do, and aim to be leaders in our field.



Acting with Integrity

We promote an open and honest environment that gives credit and acknowledges mistakes, so that our actions stand up to scrutiny.



Valuing all our people

We value the contribution of all our people, help them reach their full potential, and treat everyone with kindness and respect.



Working together

We collaborate with colleagues and partners to bring together different skills, resources and perspectives.



Leading innovation

We do things differently in ways that no one else has done before, and share the expertise and learning we gain.



Making a difference

We all play our part, doing a little bit more, a little bit better, to help improve the lives of people with cancer.



Our values set out how each of us at the ICR, works together to meet our mission – to make the discoveries that defeat cancer. They summarise our desired behaviours, attitudes, and culture – how we value one another and how we take pride in the work we do, to deliver impact for people with cancer and their loved ones.”
Professor Kristian Helin Chief Executive