IMPERIAL

Research Associate in Biochemistry/Microbiology

Department/Division/Faculty:	Department of Life Sciences, Faculty of Natural Sciences
Campus/Location:	South Kensington Campus, with regular work at the London Biofoundry (White City)
Job Family/Level:	Research Job Family, Research Associate* (Research salary scale)
Responsible to:	Dr. Simon Moore
Line management for:	N/A
Key working Relationships (Internal):	Dr. Simon Moore, Prof. Tolga Bozhurt, other members of the group, staff at the London Biofoundry, and their collaborators at Imperial.
Key Working Relationships (External):	Industry and international academic collaborators on related projects.
Contract type:	Full Time - Fixed term, 36 months

The Department of Life Sciences:

The Department of Life Sciences (DoLS) at Imperial College London, headed by Professor Dan Davis, embraces the full breadth of modern life sciences activity. It is one of the largest life sciences groups in Europe, with approximately 100 academic staff, 180+ research fellows and post-doctoral researchers, 50+ technical services staff, 40+ professional services staff, 200+ PhD students, 200+ Masters students and 800+ UG students. The Department's research and teaching activities are funded by a wide variety of research councils, charities and industries bodies, with the value of current external research grants totalling more than £100 million.

DoLS is located on 2 campuses at South Kensington and Silwood Park. Research activity is organised into 12 themes; in addition, staff are integrated into a number of multidisciplinary, cross-departmental research centres. We run 2 undergraduate degrees (Biology and Biochemistry/Biotechnology), and 16 Masters courses.

We proudly hold an Athena SWAN Bronze Award and strive to provide a working environment where all our staff feel fully supported to flourish and excel. We are committed to promoting the wide range of Family Friendly policies and associated initiatives offered by the College.

The DoLS Newsletters provide a useful insight into the activities and life in our department. Further information about Life Sciences Athena SWAN can be accessed via our website.

Purpose of the Post

The Moore laboratory (www.mooresynbio.com), Imperial College London, is recruiting a Postdoctoral Research Associate with expertise in microbiology, biochemistry, chemical biology, or a related discipline, to help develop new-to-nature natural products in *Streptomyces*, from DNA and strain engineering through to bioreactor cultivation. The post is funded by the Biotechnology and Biological Sciences Research Council (BBSRC), and involves work at the London Biofoundry.

Project Scope: Fungal and oomycete plant pathogens cause major crop losses worldwide and affect UK and global food security. Growers have few chemical options as most are being withdrawn due to toxicity, and many developmental fungicides break down in sunlight or through biological degradation. This project aims to use biosynthesis to access new-to-nature natural products with specific activity against crop pathogens and stability against chemical and biological degradation.

Expertise and Training: DNA and strain engineering form the core of the project. You will design and clone plasmid libraries (for example, by Gibson assembly), introduce them into *Streptomyces* by conjugation, and edit the genome with CRISPR-Cas9 and/or directed evolution to optimise production strains to g/L titres. Bioreactor cultivation and strain stability form the second major focus: you will scale up production from shake flask to high-cell-density bioreactor conditions, develop fed-batch protocols, and purify and analyse the products by HPLC, LC-MS and NMR. The project also includes biochemistry, involving recombinant protein purification and the design of bespoke enzyme assays. Prior experience of managing large DNA/strain libraries is an advantage. With our collaborators and the London Biofoundry, we will train you in *Streptomyces* genetic engineering, bioreactor operation, HPLC and LC-MS, and we encourage applicants with a strong background in some, though not all, of these areas to apply. Preferred candidates will also have a clear track record of consistent delivery on previously funded projects into impact deliverables, for example publications, patents or public datasets.

Environment: The Moore group runs both basic and applied research projects, the latter in partnership with industry, and operates a collaborative, non-hierarchical working style in which ideas are developed and tested through open discussion. You will work within a diverse team and benefit from interactions with other postdoctoral group members specialising in *Streptomyces* natural product biosynthesis, the engineering of heterologous expression systems, and routine biochemistry and analytical techniques. You will work alongside colleagues employed on an EU Horizon project (AIMARIA) researching the complementary area of marine natural product discovery, and alongside visiting researchers from Brazil, South Korea and other European countries. By joining the group, you will contribute to high-profile research projects and to grant, publication and patent writing, and will help mentor undergraduate and Master's students when required.

Postdoctoral Support: Dr Moore will provide direct support to help you develop your own research path, whether towards academic independence, for example through early-career fellowship applications, or towards an industry-facing career. The post may suit candidates with some prior postdoctoral experience who are already considering this transition, as well as those making their first move from a PhD. The Moore group maintains several active industry collaborations and takes an open, entrepreneurial approach to research outcomes. While the project's focus is new antifungal compounds, other commercial opportunities may arise from the work, and you will have the chance to engage with an ongoing industry collaboration on the scale-up and application of the target natural products. Imperial is a world leader in

research translation, with dedicated commercialisation support and strong industry partnerships, providing an excellent environment for an innovation-driven or industry-facing career at any stage.

Key Responsibilities

Research Duties:

- To take responsibility for the day-to-day running of experiments, DNA/strain construction, and analytical chemistry research.
- To carry out the design and execution of appropriate experiments based on high-level research goals.
- To design and construct engineered biosynthetic pathways and Streptomyces strains, using DNA assembly and CRISPR-Cas9 genome engineering.
- To produce, purify and characterise new-to-nature natural products using HPLC, high-resolution mass spectrometry and NMR spectroscopy.
- To express and purify biosynthetic enzymes, and to characterise their activity using *in vitro* biochemical assays.
- To develop and optimise fermentation processes, scaling the production of engineered strains from shake flask to bioreactor.
- To work with colleagues at the London Biofoundry (White City) on mass spectrometry and proteomics, and to coordinate the transfer of samples and data between sites.
- To work with collaborators to test the anti-fungal/anti-oomycetes biological activity of purified compounds, and to interpret the resulting data.
- To engage with industry collaborators, presenting project progress and contributing to the protection of intellectual property as required.
- To manage and mentor small teams of more junior colleagues and support learning in your field.
- To report to regular laboratory meetings and project team meetings and deliver presentations at internal and external seminars.
- To produce accurate report-ready data and to assist in the preparation of written progress reports and publications as required.
- To be proficient in new approaches and techniques, and integrate these approaches into your research projects.
- To take initiative in the planning and execution of research, and in the development of collaborations with other groups at Imperial, and external collaborators.
- To identify and develop suitable techniques for the collection and analysis of data.
- To conduct data analysis and ensure the validity and reliability of data at all times.
- To maintain accurate and complete records of all findings, and to deposit data in public repositories in line with UKRI policy.
- To write reports for submission to research sponsors.
- To prepare material for presentation in oral and poster formats.

- To attend relevant workshops and conferences (national and international) as necessary.
- To draft publications and prepare them for submission to refereed journals.
- To contribute to writing research grant bids and patent applications.
- To supervise practical work and advise students and visiting researchers on techniques.
- To take responsibility for organising resources and effective decision making in support of research.
- To develop contacts and research collaborations within the College and the wider community
- To promote the reputation of the Group, the Department and the College.

Research group infrastructure:

- To help with the smooth running, organisation of the laboratory and ensuring that good laboratory practice is observed in all procedures directly related to the research Programme, including the safe handling of genetically modified microorganisms.
- To participate in all duties associated with support of the research, including laboratory rotas.
- To take an active involvement in maintaining a safe working environment in accordance with Health & Safety procedures.

Additional Duties:

- To undertake appropriate administration tasks.
- To undertake limited teaching duties as required by the Department.
- To attend appropriate courses to develop new skills.
- To observe and comply with all College policies and regulations, including the key policies and procedures on Confidentiality, Conflict of Interest, Data Protection, Equal Opportunities, Ethics related, External Interests, Financial Regulations, Health and Safety, Imperial Expectations (for new leaders, managers and supervisors), Information Technology, and Smoking.
- To undertake specific safety responsibilities relevant to individual roles, as set out on the College Health and Safety Structure and Responsibilities web page: http://www3.imperial.ac.uk/safety/policies/organisationandarrangements
- To undertake Business Continuity responsibilities relevant to individual roles

Person Specification

Requirements Candidates/post holders will be expected to demonstrate the following:	**Essential (E)/ Desirable (D)**
Education	
Hold a PhD (or close to completion*) in microbiology, biochemistry, chemical biology or a closely related discipline, or equivalent research, industrial or commercial experience ** ** This is defined as first version of thesis has been submitted, and awaiting viva* ***Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant.*	(E)

Experience

Strong research track record, preferably demonstrated by first author publications in international journals	(E)
Experience in molecular biology and bacterial genetic engineering, including DNA assembly, cloning and strain construction	(E)
Experience in analytical techniques, such as HPLC or LC-MS, for the analysis of small molecules	(E)
Experience in the genetic engineering of Streptomyces or other actinobacteria, including CRISPR-Cas9 genome editing and the heterologous expression of biosynthetic gene clusters	(D)
Experience in microbiology and bioactivity assays	(D)
Experience in the purification and structural characterisation of natural products, using high-resolution mass spectrometry and NMR spectroscopy	(D)
Experience in recombinant protein expression, purification and enzyme assays	(D)
Experience in microbial fermentation or bioprocess development, including bioreactor cultivation	(D)
Integration of data from structural, *in silico* and biophysical studies	(D)
Mentoring and developing junior team members	(D)
Experience in working with industry partners, or in contributing to patent applications	(D)

Knowledge

Knowledge of biochemistry, natural product biosynthesis or related disciplines	(E)
Knowledge of research methods and statistical procedures	(E)

Skills & Abilities

Strong organisation skills, and proficiency in organising data, datasets, samples	(E)
Ability to conduct a detailed review of recent literature	(E)
Ability to develop and apply new concepts	(E)
Creative approach to problem-solving	(E)
Excellent verbal communication skills and the ability to deal with a wide range of people	(E)
Excellent written communication skills and the ability to write clearly and succinctly for publication	(E)
Ability to organise own work with minimal supervision	(E)
Ability to prioritise own work in response to deadlines	(E)
Advanced computer skills, including word-processing, spreadsheets and the Internet	(E)

Experience in programming or scripting (e.g., Python or R) for the analysis and visualisation of experimental data	(D)
Ability to direct the work of a small research team and motivate others to produce a high standard of work	(E)
Willingness to work as part of a team and to be open-minded and cooperative	(E)
Flexible attitude towards work	(E)
Discipline and regard for confidentiality and security at all times	(E)
Willingness to undertake any necessary training for the role	(E)
Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences, and to work across the South Kensington and White City campuses	(E)
Willingness to work out of normal working hours (including weekends) if the requirements of the project demand	(E)

Further Information

Please note that job descriptions cannot be exhaustive, and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Our values are at the root of everything we do and everyone in our community is expected to demonstrate Imperial:

- Respect
- Collaboration
- Excellence
- Integrity
- Innovation

Employees are also required to comply with all Imperial policies and regulations.

We are committed to equality of opportunity, to eliminating discrimination and to creating an inclusive working environment for all. We encourage candidates to apply irrespective of age, disability, marriage or civil partnership status, pregnancy or maternity, race, religion and belief, gender reassignment, sex, or sexual orientation. You can read more about our commitment on our webpages.

Imperial is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/

Imperial believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes which are ultimately aimed towards finding new treatments and making scientific and medical advances, and where there are no satisfactory or reasonably practical alternatives to their use. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in our care are treated with full respect, and that all staff involved with this work show due consideration at every level. Find out more about animal research at Imperial.

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