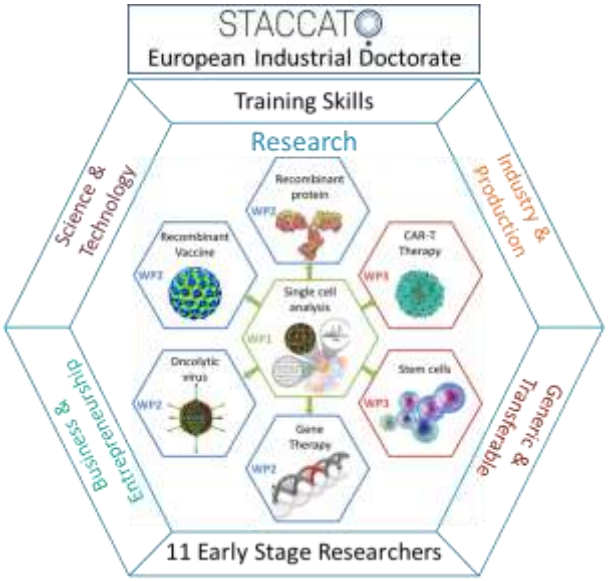
Applications Open: 11 PhD Positions within the STACCATO Marie Skłodowska-Curie EID

We are pleased to advertise 11 Early Stage Researcher Positions (Early Stage Researchers [ESRs]) within the recently granted European Industrial Doctorate project **STACCATO** - **European Industrial Doctorate for enhancing upstream biopharmaceutical manufacturing process development through single cell analysis.**

STACCATO has been specifically designed to strengthen Europe's innovation capacity and leadership in biopharmaceutical manufacturing science by providing world-class intersectoral training to 11 Early Stage Researchers (ESRs) and creating and applying pioneering manufacturing process development approaches for biopharmaceuticals. The STACCATO partners are united by the shared vision to utilise high-resolution data captured simultaneously from thousands of single cells to develop new manufacturing methods for biopharmaceuticals.



All recruited researchers will spend at least 18 of their 36 months on the project at industry partners. The multidisciplinary and intersectoral doctoral programme is based on a modular system that addresses the individual needs of the ESRs.

Beneficiary Partners:

- The National Institute for Bioprocessing Research and Training (Ireland)
- Becton Dickenson (Ireland)
- iBET (Portugal)
- Tilt Biotherapeutics (Finland)
- KTH Royal Institute of Technology (Sweden)
- Paul-Ehrich-Institut (Germany)

For further information on the project please go to www.staccato-eid.eu

What we offer

The successful candidates will join a international scientific network of high profile industry and academic partners. All fellows will benefit from intersectorial secondments, individual and networkwide training modules, including transferable skills courses. Furthermore, each ESR will be supervised by a Industry-Academia supervisory team consisting of at least one supervisor from each field.

ESRs will receive an attractive salary in accordance with the MSCA regulations for Early Stage Researchers http://ec.europa.eu/research/mariecurieactions/. The successful candidates will receive a salary for **36 months** in accordance with the MSCA regulations for early stage researchers. Exact salary will be confirmed upon appointment is subject to local rules for each host institution. The stipend is calculated as follows: Living Allowance = €3110 /month (correction factor to be applied per country) + mobility allowance = €600/month. Researcher's may also qualify for a family allowance of €500/month depending on their family situation.

ESRs will also get access to funds covering Research, Networking and Training costs. ESRs will be enrolled for PhD studies at institutions which are part of the consortium.

This project has received funding from the
European Union's Horizon 2020 research and innovation programme
under grant agreement No 813453.

Specific Eligibility Criteria on the H2020 Marie Sklodowska Curie programme:

- At the time of recruitment, the applicants should be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree.
- **Mobility rule:** At the time of recruitment, applicants should not have resided or carried out main activity (studies, work, etc.) in the country of the host for more than 12 months in the 3 years prior to the recruitment date.
- **Language skills:** Applicants must demonstrate that their ability to understand and express themselves in both written and spoken English is sufficiently high.

The STACCATO consortium is committed to increasing the percentage of female scientists and therefore especially encourages applications from potential female ESRs.

Applications

Applications should include:

- CV including your relevant professional experience and knowledge (submitted as a PDF).
- Application letter with a brief description of why you want to pursue research within the STACCATO EID, your academic interests are and how they relate to your previous studies and future goals. (Maximum 2 pages long, submitted as a PDF).
- Copy of the degree certificate(s) and transcripts of records from your previously attended university-level institutions. Translations into English or the language of the institute or companies host country if the original documents are not issued in one of these languages.
- The contact details of two possible referees or letters of recommendation (depending on the requirements of the host Institute).

Additional information

- Applications are handled confidentially and may be shared with the supervisors in the project if necessary. If you would not like your CV distributed amongst PIs in the STACCATO project team please let us know.
- For application instructions please refer to information for individual ESR positions listed below.

In case of discrepancy between the selection criteria and/or application process described in this document and that of the host institute, the host institute takes precedence

For general enquires about STACCATO ESR positions, please contact
colin.clarke@nibrt.ie

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under grant agreement No 813453.

Open positions

ESR1: Single cell analysis for Biopharmaceutical Manufacturing

Project Description: Development of Rhapsody gene panels to monitor cellular behaviour during biopharmaceutical production The BD Rhapsody workflow incorporating BDs highly accurate molecular indexing technology enables the measurement of both protein and gene expression in the same cell. Here we will use it to monitor and elucidate pathways and biomarkers associated to sample phenotype and cellular behaviour in cell culture processes in biopharmaceutical production development. Through collaboration, we will develop and validate Rhapsody primer panels targeting pathways of interest in selected cell lines (CHO, insect cell lines) and primary cells with a view to improving their performance as biopharmaceutical factories.

Expected Results: Suite of Rhapsody scRNASeq primer panels for characterisation.

Essential Background: An honours BSc or MSc in biology, biotechnology, biochemistry or a related discipline that facilitates their enrolment in a PhD program at UCD**.** Knowledge of molecular biology and transcriptomics and the application of these technologies in biopharmaceutical process development. Fluency in written and spoken English.	**Desirable Background:** Hands-on experience with cell line and primary cell cultures. In-depth knowledge in transcriptome analysis; experienced in flow cytometry and cell sorting. Practical experience with mammalian cell culture and handling of mammalian cells. Experience of working in multidisciplinary research teams. Self-motivated and ability to work collaboratively and as part of a team to an agreed work plan.
Host Institution: Becton Dickinson Research Centre Ireland Ltd (BD) (IE)	**Main Supervisor:** Dr Sean Hanniffy
PhD institution: University College Dublin (IE)	
PhD institution Requirements: https://www.ucd.ie/graduatestudies/researchprogrammes/applicationprocess/	
Planned Secondments: KTH Royal Institute of Technology (SE) (4 months); Paul-Ehrich-Institut (DE) (4 months)	
Application process: *Informal enquires*: Sean.Hanniffy@bd.com	
Planned Starting Date: 01-04-2019	**Application Deadline:** 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR2: Identification of mitochondrial DNA mutations in single cells for biopharmaceutical manufacturing

Project Description: Efficient and safe production of protein-based biological drugs, Biopharmaceuticals, depends on a robust and productive platform cell line to synthesize and secrete the drug. These is much interest in using genetic approaches to achieve this goal. This project will build on existing knowledge of mitochondrial genome mutations identified by next generation sequencing of populations of Chinese Hamster Ovary (CHO) cells. By using a state-of-the-art single cell sequencing platform, we will investigate the distribution of single nucleotide polymorphisms in the mitochondrial genes of individual cells within a population, map their appearance and frequency over time and correlate this with critical phenotypic traits such as cell growth and protein productivity. In parallel the project will capture information on the expression of nuclear-encoded mitochondrial genes. In doing so we will determine whether the type and extent of mitochondrial mutations can be used as a predictive marker for cell behavior as well as identify potential genetic engineering targets that might be manipulated via overexpression, knockdown (siRNA) or knockout (CRISPR) to improve culture performance.

Expected Results: A robust single cell mtDNA sequencing method for biopharmaceutical cells and application of the information to improve cell line development approaches.

Essential Background: An honours BSc or MSc in biology, biotechnology, biochemistry or a related discipline that facilitates their enrolment in a PhD program at UCD**.**

Knowledge of molecular biology and transcriptomics and the application of these technologies in biopharmaceutical process development.

Fluency in written and spoken English.

Desirable Background: Knowledge of bioinformatics for analysis of genomic data sets and appropriate. statistical tools for assessment of genomic data sets.

Practical experience with mammalian cell culture and handling of mammalian cells.

Experience of working in multidisciplinary research teams.

Self-motivated and ability to work collaboratively and as part of a team to an agreed work plan.

Host Institution: National Institute for Bioprocessing Research and Training (NIBRT) (IE)

Main Supervisor: Prof Niall Barron, NIBRT/UCD

PhD institution: University College Dublin (IE)

PhD institution Requirements: https://www.ucd.ie/graduatestudies/researchprogrammes/applicationprocess/

Planned Secondments: KTH Royal Institute of Technology (SE) (4 months); Horizon Discovery (UK) (4 months)

Application process: *Email application to*: careers@nibrt.ie; *Informal enquires*: niall.barron@nibrt.ie

Planned Starting Date: 01-04-2019

Application Deadline: 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR3: Single cell proteomics to analyse functional heterogeneity during biopharmaceutical manufacturing

Project Description: Establishment of an efficient methodology for single cell proteomics using high resolution liquid chromatography mass spectrometry (LC-MS). The successful candidate will validate sample preparation workflows for single cell proteomics to ensure maximum recovery of the cellular proteome and will investigate nanoflow LC-MS workflows based on sub 10 nL/min analytical flow rates to maximise MS sensitivity for subsequent proteome analysis using either discovery (DDA or DIA) or targeted acquisition approaches.

Expected Results: Optimised platform for proteomic sample preparation from single cells focused on maximising recovery of the proteome and LCMS based methods.

Essential Background: An honours BSc or MSc in bioanalytical science, chemistry, biochemistry or a related discipline that facilitates their enrolment in a PhD program at UCD**.**

Knowledge of liquid chromatography and high-resolution mass spectrometry (LC-MS) and the application of the technology for quantitative proteomics.

Fluency in written and spoken English.

Desirable Background: Knowledge of bioinformatics for analysis proteomic data sets and appropriate. statistical tools for assessment of proteomic data sets.

Practical experience with mammalian cell culture and handling of mammalian cells.

Experience of working in multidisciplinary research teams.

Self-motivated and ability to work collaboratively and as part of a team to an agreed work plan.

Host Institution: National Institute for Bioprocessing Research and Training (NIBRT) (IE)

Main Supervisor: Prof Jonathan Bones, NIBRT/UCD

PhD institution: University College Dublin (IE)

PhD institution Requirements: https://www.ucd.ie/graduatestudies/researchprogrammes/applicationprocess/

Planned Secondments: iBET (PT) (4 months); Paul-Ehrich-Institut (DE) (4 months)

Application process: *Email application to*: careers@nibrt.ie; *Informal enquires*: jonathan.bones@nibrt.ie

Planned Starting Date: 01-04-2019

Application Deadline: 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR4: Improving oncolytic adenovirus production in host cell utilising single cell analysis technology

Project Description: TILT Biotherapeutic's patented technology involves utilization of oncolytic viruses for enhancement of tumor T-cell therapy including checkpoint inhibitors. Initial embodiments of the technology will be used to enhance tumor infiltrating lymphocyte therapy, checkpoint antibodies and chimeric antigen receptor (CAR) T-cell therapy. For clinical trials, virus vector needs to be produced in high concentrations according to cGMP. Aim of the project is to increase the efficiency of the TILT-123 oncolytic adenovirus manufacturing processes, and study in single-cell level which factors in production cell lines determine the success of the manufacturing process. Functional studies will be extended also to other tumour and normal cells.

Expected Results: Optimized, scalable production method for oncolytic adenovirus vectors. Understanding of factors influencing oncolysis and other outcomes of TILT-123 in tumour and normal cells.

Essential Background: MSc degree in biological, biomedical or medical sciences field or in Tech/Engineering. Previous experience in immunology, bioengineering or virology is required. The project will involve animal work.	**Desirable Background:** Viral vector, biologicals and/or cell therapy products, experience and knowledge gained in a CMC/GMP-setting. Knowledge in FDA, EMA, and other relevant guidelines. Skills and training in working with rodents: mice and hamsters. Experience in molecular biology, immunology, cell biology. Able to appear for interviews in Helsinki in person.
Host Institution: TILT Biotherapeutics Ltd. (FI)	**Main Supervisor:** Dr Suvi Sorsa
PhD institution: University of Helsinki (FI)	
PhD institution Requirements: https://www.helsinki.fi/en/research/doctoral-education	
Planned Secondments: National Institute for Bioprocessing Research and Training (NIBRT) (IE); iBET, Portugal (4 months)	
Application process: *Informal enquires*: recruitment@tiltbio.com *Email Application to*: recruitment@tiltbio.com	
Planned Starting Date: 01-04-2019	**Application Deadline:** 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR5: Developing high cell density perfusion culture media through single cell analysis

Project Description: High cell density perfusion (HCDP) culture has been identified as a highly potential tool for process intensification for the production of biologics. it is very important to get a better understanding of high cell density perfusion cultures and provide new tools for the development of such processes. In particular, the project will aim at creating methods to design the culture medium used for high cell density perfusion process based on mathematical modelling integrating knowledge of single-cell omics. The group of Cell Technology (CETEG) in the Dept. Industrial Biotechnology - CBH School at KTH, has a strong experience in the development of biopharmaceutical drug bioprocesses for human therapy. The group is leading AdBIOPRO, Competence Centre for Advanced Bioproduction by Continuous Processing, and iConsensus, an EU-IMI project aimed among others at developing on-line/in-line sensing environment of cell culture.

Expected Results: A novel approach for HCDP medium development and in particular for HCDP

Essential Background: Have passed a degree at advanced level.

- Completed course requirements of at least 240 higher education credits, of which at least 60 higher education credits at advanced level,
or
- in any other way acquired within or outside the country acquired essentially equivalent knowledge.

- Experience of mammalian cell culture bioprocess and perfusion culture bioreactor

- Knowledge of mathematics and modelling methods

Desirable Background:

Host Institution: KTH Royal Institute of Technology (SE)

Main Supervisor: Dr Véronique Chotteau, KTH

PhD institution: KTH Royal Institute of Technology (SE)

PhD institution Requirements: Please see: Chapter 7, 39 § Swedish Higher Education Ordinance

Planned Secondments: National Institute for Bioprocessing Research and Training (NIBRT) (IE) (8 months); Cobra Biologics and Pharmaceutical Services (SE) (10 months).

Application process: *Apply via website:* https://www.kth.se/en/api/lediga-jobb/what:job/jobID:240709/where:4/
Informal enquires: chotteau@kth.se

Planned Starting Date: 01-04-2019

Application Deadline: 27-12-2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR6: Understanding CHO cell heterogeneity to enable increased production of recombinant therapeutic proteins

Project Description: This project will focus on utilising single cell analysis to understand the relationship between heterogeneity and bioprocess performance for recombinant protein production in CHO cells. Single cell analysis will be utilised to screen a NIBRT's in-house library of CHO cell lines producing a variety of therapeutic protein types (e.g. infliximab and trastuzumab) to determine the correlation between gene expression variability and bioprocess phenotypes such as product quality. The results of single cell analysis will be utilised to guide CRISPR-Cas9 mediated engineering to yield increasingly homogenous glycoprofiles and higher yields for selected therapeutic proteins. ESR6 will also work to develop bioinformatics workflows for scRNASeq.

Expected Results: Understanding the production demands of producing a range of therapeutic proteins in CHO cells for. Increasing the understanding the origins of glycosylation heterogeneity for a range of therapeutic proteins. Creation of new high performance CHO cell lines generated using genetic engineering.

Essential Background: An honours BSc or MSc in biology, biotechnology, biochemistry or a related discipline that facilitates their enrolment in a PhD program at UCD**.** Knowledge of molecular biology and transcriptomics and the application of these technologies in biopharmaceutical process development. Fluency in written and spoken English.	**Desirable Background:** Knowledge of bioinformatics for analysis transcriptomic data sets and appropriate. statistical tools for assessment of transcriptomic data sets. Practical experience with mammalian cell culture and handling of mammalian cells. Experience of working in multidisciplinary research teams. Self-motivated and ability to work collaboratively and as part of a team to an agreed work plan.
Host Institution: National Institute for Bioprocessing Research and Training (NIBRT) (IE)	**Main Supervisor:** Dr Colin Clarke
PhD institution: University College Dublin (IE)	
PhD institution Requirements: https://www.ucd.ie/graduatestudies/researchprogrammes/applicationprocess/	
Planned Secondments: Horizon Discovery (UK) (4 months); Paul-Ehrich-Institut (DE) (4 months)	
Application process: *Email application to*: careers@nibrt.ie; *Informal enquires*: colin.clarke@nibrt.ie	
Planned Starting Date: 01-04-2019	**Application Deadline:** 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR7: Improving production of influenza VLP-based vaccines in insect cells using single cell analysis

Project Description: At iBET and within the scope of EU-funded project "EDUFLUVAC" (http://www.edufluvac.eu/), next generation Influenza vaccines capable of mounting broad neutralising antibodies, extending vaccine life-span, are being created. These are virus-like particles (VLP)-based vaccines comprised of multiple/selected hemagglutinin (HA) proteins, produced using either the lytic baculovirus expression vector system (IC-BEVS) or stable insect cell lines. Titers achieved are still low, thus bioprocess engineering is critical to improve process performance while reducing lead and production times. This PhD project aims at improving the production of Influenza VLPs in insect cells using single-cell analysis. The idea is to capture the molecular signatures of insect Sf-9 and High Five cell factories during Influenza VLPs production and apply the knowledge therein extracted to assist in baculovirus and/or insect cell genetic engineering to improve production yields. In addition, a continuous Influenza VLPs biomanufacturing scheme will the designed to manufacture high quantities of vaccines in short time-frames, a key feature in case of pandemics or vaccine composition update.

Expected Results: (a) Increased knowledge on the underlying biological mechanisms of insect cell factories essential for efficient production of influence VLPs; (b) Improved cell specific productivity by rational genetic engineering of baculovirus and/or insect cells; (c) Establishment of a continuous process mode for influenza VLP vaccine production in stirred tank bioreactors.

Essential Background: Shall be in the first four years of their research careers and have not been awarded a doctoral degree (any nationality is allowed)

- Must not have resided or carried out their main activity (work, studies, etc.) in Portugal for more than 12 months in the 3 years immediately prior to planned starting date (see below)
- Excellent knowledge of English, spoken and written
- Excellent communication and organization skills
- Availability to travel nationally and internationally two to three times a year
- Motivation for applied research and good teamwork skills

Desirable Background: Master Degree (or equivalent) in Biotechnology, Biological Engineering, or related areas

- Relevant scientific background, including one but preferably several of the following: (a) experience in cell culture, (b) experience in molecular biology, (c) experience in expression and purification of recombinant proteins, (d) experience with analytical methods for product monitoring (e.g. Wb, ELISA, HA assay, SRID, flow cytometry, microscopy, immuno-labelling), (e) basic knowledge in bioreactor technology, and (f) fundamentals in simple programming tasks.
- Experience with scientific outreach events (e.g. seminars, podcasts, open days)

Host Institution: iBET (PT)

Main Supervisor: Prof Paula Alves

PhD institution: Universidad Nova de Lisboa,

PhD institution Requirements: http://www.itqb.unl.pt/education/PhD%20Programs/phd-degrees

Planned Secondments: TILT Biotherapeutics Ltd. (FI) (4 months); University of Helsinki (FI) (4 months)

Application process: *Informal enquires*: **:** alves@ibet.pt and aroldao@ibet.pt; *Applications*: aroldao@ibet.pt

Planned Starting Date: 01-04-2019

Application Deadline: 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR8: Combining single-cell analysis with systems biology to fine-tune production of rAAV vectors in insect cells

Project Description: Insect cell factories capable of manufacturing high quantities of (quality) recombinant adeno-associated virus (rAAV) vectors for gene therapy applications are distinctly lacking today. At iBET, the insect cell-baculovirus expression vector system (IC-BEVS) is being used for the production of these vectors but titers achieved are still low. Therefore, bioprocess engineering is critical to improve process performance while reducing lead and production times. This PhD project aims at solving this bottleneck by capturing the molecular signatures of insect Sf-9 cell factories during rAAV production and then combining it with metabolomics and fluxomics information to assist rational baculovirus engineering and bioprocess optimization (e.g. design of tailor-made refeed supplementation strategies). These new tools will allow the design and implementation of an hybrid bioprocessing system to improve rAAV productivity, a more cost-effective setup for production of rAAV vectors at large-scale when compared with perfusion or fed-batch.

Expected Results: (a) Increased knowledge on the underlying biological mechanisms for efficient rAAV vector production; (b) A framework integrating single-cell analysis with systems biology tools (metabolomics and fluxomics) for process design; (c) Hybrid bioprocessing system for production of rAAV vectors using rational refeed strategies.

Essential Background: - Shall be in the first four years of their research careers and have not been awarded a doctoral degree (any nationality is allowed)

- Must not have resided or carried out their main activity (work, studies, etc.) in Portugal for more than 12 months in the 3 years immediately prior to planned starting date (see below)

- Excellent knowledge of English, spoken and written

- Excellent communication and organization skills

- Availability to travel nationally and internationally two to three times a year

- Motivation for applied research and good teamwork skills

Desirable Background: - Master Degree (or equivalent) in Biotechnology, Biological Engineering, or related areas

- Relevant scientific background, including one but preferably several of the following: (a) experience in cell culture, (b) experience in molecular biology, (c) experience in expression and purification of recombinant proteins, (d) experience with analytical methods for product monitoring (e.g. Wb, ELISA, qPCR, flow cytometry, microscopy), (e) basic knowledge in bioreactor technology, and (f) basic experience and motivation for programming tasks.

- Experience with scientific outreach events (e.g. seminars, podcasts, open days)

Host Institution: iBET (PT)

Main Supervisor: Prof Paula Alves, iBET and ITQB NOVA

PhD institution: Universidad Nova de Lisboa (PT)

PhD institution Requirements: http://www.itqb.unl.pt/education/PhD%20Programs/phd-degrees

Planned Secondments: University College Dublin (IE) (4 months); MeiraGTx Ltd (UK) (4 months)

Application process: *Informal enquires*: **:** alves@ibet.pt and aroldao@ibet.pt; *Applications*: aroldao@ibet.pt

Planned Starting Date: 01-04-2019

Application Deadline: 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR9: Determining the molecular impact of the manufacturing process for the phenotype of CAR T cells

Project Description: CAR T cells are generated from the patients' lymphocytes in a complex manufacturing process involving activation of the cells, transduction and expansion. These manipulations have tremendous influence on the phenotype and properties of the T cells. In this project single cell profiling will be applied to follow these events. A particular emphasis will be put on the comparison of generating CAR T cells under full activating or minimally activating conditions by making use of T cell targeted lentiviral vectors developed in the host laboratory (Pfeiffer et al., 2018, EMBO Mol Med 10, e9158; Buchholz et al., 2015, TIBTEC 33, 777).
Expected Results: Molecular insights into the CAR T cell production process.

Essential Background: Top master examination qualified for PhD studies at TU Darmstadt**,** distinct analytical skills and interest in bioinformatics, team-minded and able to manage and organize research projects.	**Desirable Background:** Hands-on experience with cell/lymphocyte cultivation and/or viral vectors; in-depth knowledge in cancer immunotherapy and/or transcriptome analysis; experienced in flow cytometry.
Host Institution: Paul-Ehrich-Institut (DE)	**Main Supervisor:** Prof Christian Buchholz, PEI
PhD institution: Technical University of Darmstadt (DE)	
PhD institution Requirements:	
Planned Secondments: Becton Dickinson Research Centre Ireland Ltd (BD) (IE)(18 months)	
Application process: https://www.pei.de/EN/service/vacancies/vacancies-node.html?yid=347&sid=kir4hnr9gkdv1o0d5osaas4pjc	
Planned Starting Date: 01-04-2019	**Application Deadline:** 28-02-2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.

ESR10: Molecular impact of T-cell targeted gene transfer under minimal manipulation conditions

Project Description: The host laboratory has developed unique lentiviral vectors that deliver CAR genes selectively into subtypes of T cells due to usage of cell surface markers as entry receptors (Pfeiffer et al., 2018, EMBO Mol Med 10, e9158; Buchholz et al., 2015, TIBTEC 33, 777). Here, we will apply single cell RNA profiling combined with protein measurements to identify the subtypes and phenotypes of T cells that are preferentially transduced by these vectors. Special emphasis will be put on correlating vector particle binding with target receptor expression and successful CAR gene delivery. Expected Results: Improved understanding of the entry and transduction process of T cell targeted lentiviral vectors in primary lymphocyte cultures and CAR T cell manufacturing.

Expected Results: Understanding the impact of the gene delivery process on the properties of CAR T cells.

Essential Background: Top master examination qualified for PhD studies at TU Darmstadt**,** distinct analytical skills and interest in bioinformatics, team-minded and able to manage and organize research projects.	**Desirable Background:** Hands-on experience with cell/lymphocyte cultivation and/or viral vectors; in-depth knowledge in cancer immunotherapy and/or transcriptome analysis; experienced in flow cytometry
Host Institution: Paul-Ehrich-Institut (DE)	**Main Supervisor:** Prof Christian Buchholz, PEI
PhD institution: Technical University of Darmstadt (DE)	
PhD institution Requirements:	
Planned Secondments: Becton Dickinson Research Centre Ireland Ltd (BD) (DE) (18 months)	
Application process: https://www.pei.de/EN/service/vacancies/vacancies-node.html?yid=347&sid=kir4hnr9gkdv1o0d5osaas4pjc	
Planned Starting Date: 01-04-2019	**Application Deadline:** 28-02-2019

This project has received funding from the
European Union's Horizon 2020 research and innovation programme
under grant agreement No 813453.

ESR11: Development of methods to control differentiation of stem cells in a 3D cell culture system based on spider silk

Project Description: The main goal within this project is to use stem cell differentiation to develop cellular therapies for diabetes. Silk proteins have a unique propensity to assemble their chains in an ingenious way so that a material with favourable properties is formed. The research group of Hedhammar has recently developed a method for facile, efficient and quick integration of cells into 3D culture by the assembly of silk into a network of microfibers mimicking the natural extracellular matrix. The recombinant silk protein used for this procedure is functionalized with a cell adhesion motif from the extracellular matrix protein fibronectin, thereby supporting 3D culture of also more sensitive cells. Within this project, the silk assembly method will be used to create defined microenvironments for efficient and controlled differentiation of stem cells into pancreatic progenitors suitable for drug screening and transplantation purposes.

Expected Results: A general protocol for culture and differentiation of stem cells integrated in a 3D silk scaffold format suitable for a bioreactor with support of scRNASeq and proteomics

Essential Background: Have passed a degree at advanced level. - Completed course requirements of at least 240 higher education credits, of which at least 60 higher education credits at advanced level, **or** - in any other way acquired within or outside the country acquired essentially equivalent knowledge. **-** Previous experience of mammalian cell culture (preferably stem cells and differentiation thereof) and common molecular biology analyses	**Desirable Background:**
Host Institution: KTH Royal Institute of Technology (SE)	**Main Supervisor:** Assoc. Prof My Hedhammar
PhD institution: KTH Royal Institute of Technology (SE)	
PhD institution Requirements: Please see: Chapter 7, 39 § Swedish Higher Education Ordinance	
Planned Secondments: Spiber Technologies AB (SE) (10 months); National Institute for Bioprocessing Research and Training (NIBRT) (IE) (8 months)	
Application process: *Apply via website:* https://www.kth.se/en/api/lediga-jobb/what:job/jobID:240781/where:4/ *Informal enquires*: myh@kth.se	
Planned Starting Date: 01-04-2019	**Application Deadline:** 27-12-2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 813453.