UCB Pharma SA Chemin du Foriest – B – 1420 Braine l'Alleud (Belgium)
Pharma Sciences / ITS Innovation Technology Sciences
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Subject : Proposal for an internship at UCB PHARMA for 2018

(Belgium, UK)

By E NORRANT

Please find subject for internship at UCB Pharma for 2018 on the:

- **research centers based Braine l'Alleud in Belgium close to Brussels**
- **research centers based Slough in UK (Close to London)**

On both research centers, we have more than 40 different nationalities, so English language is recommended for reports and oral communication.

If you are interested by one of this proposal, please send your resume and a motivated letter to the following email address: edith.norrant@ucb.com and the manager of the subject (See on the proposal).

You will receive an indemnity during your internship in order to reimburse your accommodation and meals.

If you need any information, do not hesitate to contact me or your direct potential manager.

Contact :
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UCB Pharma :

A global biopharma focused on severe diseases with operations in approximately 40 countries with 7500 employees and global revenue of € 4.2 billion in 2016, with REBITDA of €1 031million.

- **We combine biology and chemistry to make major breakthroughs.** By integrating our expertise in large, antibody-based molecules and small, chemically-derived molecules, we can offer families with severe diseases and their specialist physicians the advantages of both large and small molecules to produce extraordinary breakthroughs.
- **We partner with the leaders in the pharmaceutical industry.** The complexities of severe diseases are beyond the expertise and resources of a single organization. That is why we have teamed up with partners - we play to our strengths and tap into the organizations with greater or complementary strengths

Contents

1. Development of sustained-release formulations for the subcutaneous administration of biotherapeutics

Job description

The aim of the project consists in developing sustained-release formulations for the subcutaneous administration of biotherapeutics.

Due to the relative low bioavailability observed when biotherapeutics are administered by noninvasive routes (e.g. oral route), such biomolecules are commonly parenterally delivered. However, using conventional parenteral dosage forms, frequent injections are required to maintain the drug concentration into the therapeutic window due to the reduced serum half-times of proteins. This may induce lack of patient compliance as well as peaks and valleys effect in blood levels due to multiple dosing. That is why development of sustained-release formulations has been intensified over the past few years.

These controlled-release systems must meet several criteria. For instance, they should be characterized by high drug loadings to allow the administration of therapeutic doses as well as by a continuous and sustained-release profile over time. These formulations should also maintain the physicochemical stability of the proteins through both production and delivery to avoid immunogenicity issues.

The strategy chosen for this project is the encapsulation of the biomolecule into a polymeric matrix. Indeed, this method allows the protection of the encapsulated biomolecule against degradation as well as its controlled release over time. In order to produce the sustained-release formulations, the spray-drying of a water-in-oil (w/o) emulsion was selected for this project. Spray-drying is a one-step process that is reproducible and easily scalable. Moreover, compared to double emulsions techniques, the spray-drying of a w/o emulsion avoids the presence of an external aqueous phase and it can therefore lead to the production of microparticles with higher drug loadings.

So far, this encapsulation process has been applied to one full-length monoclonal antibody. In order to evaluate the possibility of creating a delivery platform using this method, other biological compounds with different characteristics should also be tested.

Besides, “real-time” release of biological compounds from these sustained-release systems can last for months which is a limitation for the proper development of these formulations. Furthermore, the method that is currently used to evaluate the *in vitro* release of biological compounds from the sustained-release formulations is not really representative of the *in vivo* release Thus, it would be interesting to develop on one hand, an accelerated release test and on the other hand, an *in vitro* test that would represent in the closest way possible the *in vivo* release of biotherapeutics.

In this context, the internship will be divided in two parts:

The first part will consist in:

- applying the encapsulation process to two other biological compounds: peptides and an antibody fragment
- performing a complete characterization of the produced formulations: morphology, particles size, release profile, stability of the compound inside the formulations, etc…
- optimizing the formulations according to the results obtained

The second part will consist in:

- developing an accelerated release test that would be predictive of the “real-time” release test and that would be able to differentiate different formulations
- developing an *in vitro* release test based on the *in vivo* data already available for the sustained-release formulations of one antibody

Contract:

Minimum 5- 6 months full time

Indemnity (750€/month)

Adress of the Site :

UCB Pharma
Avenue de l'industrie
1420 Braine-L'Alleud, Belgium

Started date :

February or March 2018

Profil of student

He or she should :

- have knowledge of different analytical methods (HPLC, particle size analysis,…) especially in biological compounds characterization
- have a good knowledge in pharmaceutical development
- have good oral and written communication skills
- speak and write in English

Manager with email and phone number:

Sarah Marquette
Principal Scientist in Biological Formulation Development
sarah.marquette@ucb.com
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Driven by science.

2. Formulation of nanoparticles for API

Job description

1. Scale-up of a rapid method of nano-formulations preparation by design of experiment.
2. Establishment of a screening tool by design of experiment to study the parameters influencing the stabilization of nano-formulation
3. Application of this tool on a series of trade molecules and molecules UCB.
4. Create a database to make a connection between the characteristics of the starting compounds and the choice to use stabilizers.

Contract:

Mini 5- 6 Months full time

Indemnity (750€/month)

Adress of the Site :

UCB Pharma
Formulation and process development
Chemin du Foriest – B3
B-1420 Braine L'Alleud

Started date :

2018

Profil of student

Pharmacy student

Manager with email and phone number:

Chirico Rosana
Formulation scientist
Rosana.chirico@ucb.com
+3223862653

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3. Analytical method development to determine the particle size distribution of pharmaceutical product as it and / or in aqueous suspension formulation

Job description

In the pharmaceutical industry, the particle size of powders is one of the most critical parameters because it can impact the chemical process (chemical reaction…), the manufacture of the drug product (flowability powder…), the bioavailability of the drug product (low absorption…), the storage (segregation…).

The definition of the characteristics of the particle size becomes increasingly complex when the number of particles having different particle size increases and when the particles shape become more and more complex. In practice, powders consist of solid particles presenting heterogeneous of size and shape. Different particle sizing methods can be used for the same application, the best choice of sizing method depends upon both the nature of the sample and what characteristics of the size distribution are most important. One method can never suit all samples.

At UCB, different techniques are available for this purpose such as laser diffraction, static image analysis (optical microscopy, scanning electronic microscopy), dynamic image analysis and photon correlation spectroscopy. The student will be brought to develop analytical methods to determine the particle size distribution of pharmaceutical product as it and \ or in suspension in aqueous formulations.

Contract:

Mini 5- 6 Months full time

Indemnity (750€/month)

Adress of the Site :

UCB Pharma S.A

Chemin du Foriest

Building B3

1420 Braine L'Alleud

Started date : January to December

Profil of student

Technical/scientific skills: chemical background and / or pharmaceutical background with an interest to analytical development

Orientation to analytics is a plus.

Engineer or master is requested

Language skills: English and French is a plus.

Software skills: ability to grasp quickly new analytical softwares

Soft skills: work efficiency, autonomy, ability to work in a team, adaptability.

Manager with email and phone number:

Willy Briône Scientist

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4. Analytical method development to monitor the crystallization of an amorphous in aqueous suspension by RAMAN spectroscopy

Job description

In the pharmaceutical field, the development of a drug follows several steps. During the preclinical studies, pharmacology, pharmacokinetic and toxicology tests are done on animals. These tests can be done in several ways (ex: oral route, intravenous etc.). In the case of oral route, solubility by absorption can be a problem; if the API hasn't got a good solubility, the wanted bioavailability might not be reached. Thus, liquid formulations using Amorphous Solid Dispersions (ASD) APIs are developed with the challenge of maintaining the API in its amorphous form. This amorphous solid state generally has a better solubility than crystalline solid state can therefore increase the absorption. To characterize and measure (by time) the stability of those formulations, several techniques such as RAMAN spectroscopy and X-Ray powder diffraction are usually used. Amorphous solid dispersion present stability issues; when put in aqueous suspension they tend to recrystallize. A preliminary test of RAMAN spectroscopy will be to show the linear response between the spectra signal and the ratio crystalline/amorphous in suspension. The main goal will be to develop a method capable of following the crystallization of an amorphous in aqueous suspension, to study qualitatively and quantitatively amorphous' stability using RAMAN spectroscopy and chemometrics.

Contract:

Mini 5- 6 Months full time

Indemnity (750€/month)

Adress of the Site :

UCB Pharma S.A

Chemin du Foriest

Building B3

1420 Braine L'Alleud

Started date :

January to December

Profil of student

Technical/scientific skills: chemical background and / or pharmaceutical background with an interest in analytical development. A good understanding of chemometric. Formulation knowledge is a plus.

Language skills: English and French is a plus

Software skills: ability to grasp quickly new analytical softwares, knowledge in chemometric modelling softwares is a plus (Matlab, SIMCA, Unscrumbler X)

Soft skills: work efficiency, autonomy, ability to work in a team, adaptability.

Manager with email and phone number:

Willy Briône
Scientist
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+3223862699

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5. Bioinformatic- statistic for bioanalytical department

Job description

The position is within the Characterization team in Analytical Sciences, Biologics UK. The team is comprised of 20 experienced scientists that use a wide range of techniques to elucidate the structure/function of biological drugs that are currently in development.

The project focuses on combining and standardizing data outputs from multiple mass spectrometry analyses and then visualizing and interrogating these data sets using existing or bespoke software packages. It will provide the opportunity evaluate and design integrated software systems to analyze diverse datasets and to turn data into knowledge. Experience in writing software/scripts is a plus.

It is an ideal opportunity for an enthusiastic bioinformatics scientist to develop skills and experience in the biopharmaceutical sector. The group collaborates with teams and projects within UCB across sites in the UK, Belgium, Switzerland and the US. The group also has academic collaborations.

Contract:

Min 5- 6 Months full time

Indemnity (~ £750/month)

Address of the Site :

UCB Pharma UK

[216 Bath Road, Slough, Berks SL1 3WE]

Started date :

ASAP - 2018 / Finish date – depends on course

Profil of student

BSc in bioinformatics, statistics or relevant scientific subject.

Manager with email and phone number:

John O'Hara
Function: Director Characterization of Protein
Email address : john.ohara@ucb.com
Phone number : +44-1753-44 7987

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