



Utrecht University



The Honours Programme of Pharmaceutical Sciences

For students of Pharmaceutical Sciences and CPS

Welcome to the Honours Programme Pharmaceutical Sciences!

Dear Students, the department of Pharmaceutical Sciences welcomes you and invites you to participate in the Honours Programme Pharmaceutical Sciences (HPPS). This programme offers excellent students a possibility to design, based on their own interests and drive to explore, a combination of extracurricular courses and projects besides their regular study curriculum. The HPPS is meant for students that belong to the College of Pharmaceutical Sciences as well as for the Pharmaceutical Sciences cohorts, who feel that their regular curriculum does not provide enough challenge or in-depth courses and practical courses, or for those who want to broaden their general knowledge of natural sciences.

In this booklet, you will find valuable information about the Honours Programme Pharmaceutical Sciences (HPPS), and questions like:

- does the honours programme fit your specific interests?
 - do you fit the profile of an honours student?
 - how is the honours programme structured?
 - how is the recruitment of new honours students organized?
- will hopefully be answered.

Students can participate in committees to organize meetings, symposia, workshops, and excursions. Students can start up their own projects to deepen and broaden their knowledge of the pharmaceutical sciences. Students can initiate collaborations with other HP students of the diverse departments within the faculty of Science to work together on complex and interdisciplinary projects that are currently highly relevant. The students follow their own honours track guided by their own interests and curiosity. This self-steering character makes for each student the honours programme a unique and valuable addition to the regular study curriculum

This booklet includes several examples of projects performed by HP students as well as their own comments and findings on such projects and on the HPPS as a whole.

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Introduction

The Honours Programme Pharmaceutical Sciences (HPPS) is a programme for students of Pharmaceutical Sciences (PS) and College of Pharmaceutical Sciences (CPS) who are looking for extra challenge outside their regular study curriculum. This honours programme contains deepening as well as broadening elements on the field of Pharmaceutical Sciences. You will deepen your knowledge about this discipline, but also develop your own excellent academic skills. It is an option to explore the field of Pharmaceutical Sciences based on your own interests. Honours students are generally ambitious, curious, hard working, creative, and like to challenge themselves, but even if you do not recognise yourself in this profile, the HPPS might be something for you. Have a look through this brochure and find out!

The programme is apart from the regular study programme of Pharmaceutical Sciences and CPS. In order to receive your honours certificate, you have to collect 45 ECTS (PS) or 15 ECTS (CPS) during your bachelor studies. 7.5 ECTS equals 210 hours of work. Ways to collect credit are by participating in (your own) projects, organizing a symposium, giving workshops, joining committees, follow ingcourses, and more. More details on the programme can be found on pages 4 and 5.



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Honours vs. Regular Education

	Honours education	Regular education
Group size	Small cohort	Large cohort
Interaction	More interaction with faculty, staff, and fellow Honours students	Less interaction with the faculty and staff
Teaching method	More student-centred: more self-regulation and proactive learning	More teacher-centred: more regulation by the teacher and passive learning
Learning	More cooperative learning, freedom in choice of study topic and more responsibility in the student's own development	More self-learning, more restriction by the study curriculum
Opportunities to perform research	Many more opportunities because of the interaction with the staff and research groups	Fewer opportunities, as contact with the staff and research groups is limited
Opportunities to train skills	Many more opportunities to train skills such as academic skills, research skills, communicative skills, and especially leadership skills	Fewer possibilities to train your skills, apart from the obligatory skills tests
Aspects of focus	<ul style="list-style-type: none"> ♦ Community building ♦ Global thinking ♦ Ethical reflection on scientific developments ♦ Own choices, dealing with insecurities ♦ Interdisciplinary 	<ul style="list-style-type: none"> ♦ Theoretical knowledge ♦ Practical knowledge ♦ Following standard pathways ♦ Future job of pharmacist or researcher

Pharmaceutical Sciences

The Honours Programme Pharmaceutical Sciences (HPPS) is meant for both bachelor students of Pharmaceutical Sciences (PS) and College of Pharmaceutical Sciences (CPS). Students are selected based on motivation, grades and skills in the first semester of their first year (periods 1 and 2). The HPPS includes 45 ECTS, which is 25% of the regular Bachelor's programme.

- 15 ECTS are reserved for extracurricular activities. These credits are given based on successful participation in several honours activities, including the Science Honours Academy (SHA) and the participation in bigger and longer (research) projects (HPPS). Half of the ECTS are earned in the SHA and half in the HPPS.
- 15 ECTS can be earned through the fulfilment of extra assignments in regular courses and attending Honours level courses. The extra assignments will be determined in cooperation with the course coordinator and the honours coordinator, and have an individual character, aimed at the specific interests of the honours student.
- 15 ECTS are reserved for the Honours thesis. The Honours thesis can be seen as a small research project, in which the student will make some of the essential steps of research. This includes generating, testing and developing a research proposal, establishing and implementing its experiments, and reporting and presenting the research results. The final product will be a research proposal in the form of a presentation and an Honours thesis.

Both, student and Honours Coordinator, will maintain a record in which they save proof of the completed activities, so that the Honours Coordinator can finish all administrative work at the end of the education.

Application procedure

The HPPS Committee, which is also the admission committee, will invite the students who belong to the top 10%, based on their study results in the first two quarters. Students who are recommended by their tutor or student network will also be contacted. Other students who are believed to also belong to the top 10% will explicitly be invited to apply. The application should contain the following pieces, preferably in one document:

- A letter of motivation
- A résumé
- Grades from your high school diploma and blocks 1 and 2, with the grade average
- One or two educational products of choice, such as a presentation or a paper. This can be your end project from high school or a project from the first blocks at the university

In February a presentation is given about Honours. Students will have to apply before the end of March. For application and further information, students can contact dr. Dirk Rijkers (d.t.s.rijkers@uu.nl).

Progression into year 2&3 of HP

Every year will end with signing off on the HP ECTS (as judged by the HPPS Committee) and you have to show your motivation during the year to continue with the program. The HPPS will stop at the end of your bachelor studies. If all requirements are met, the Honours certificate will be given during a separate ceremony.

Students will be removed from the programme after a year if they have not applied for an interview or if they have not actively participated in extracurricular activities.

The HP board will decide about removal from the programme, taking into account any special personal circumstances that were notified to the board by the student as soon as possible.

Overall structure of HPPS

College of Pharmaceutical Sciences

The Honours Programme Pharmaceutical Sciences (HPPS) is meant for both bachelor students of Pharmaceutical Sciences (PS) and College of Pharmaceutical Sciences (CPS). The HPPS includes 15 ECTS. Those 15 ECTS are reserved for extracurricular activities. These credits are given based on a successful participation in several honours activities, which includes the Science Honours Academy (SHA) and the participation in bigger and longer (research) projects (HPPS). Half of the ECTS are earned in the SHA and half in the HPPS.

Both, student and Honours Coordinator, will maintain a record in which they save proof of the completed activities, so that the Honours Coordinator can finish all administrative work at the end of the education.

Application procedure

If you want to join, you can send dr. Dirk Rijkers (d.t.s.rijkers@uu.nl) an email with a short motivation and an indication of the grades of periods 1 and 2.

In February a presentation is given about Honours. Students will have to apply before the end of March. For application and further information, students can contact dr. Dirk Rijkers (d.t.s.rijkers@uu.nl)

Progression into year 2&3 of HP

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Overall structure of HPPS

Intracurricular	Introduction to the HP community (Blocks 3 and 4, year 1)
Extracurricular	Interdisciplinary activities from the SHA (7.5 ECTS)
	Bigger, long-term projects at HPPS (7.5 ECTS)

	Blocks 3 and 4, year 1	Year 2 and 3
Intracurricular	Introduction to the HP community	Different courses at honours level, e.g. One Health (7.5 ECTS) or Pharmaceutical Biotechnology (7.5 ECTS)
		Honours Thesis (15 ECTS)
Extracurricular	Interdisciplinary activities from the SHA (7.5 ECTS)	
	Bigger, long-term projects at HPPS (7.5 ECTS)	

Honours courses

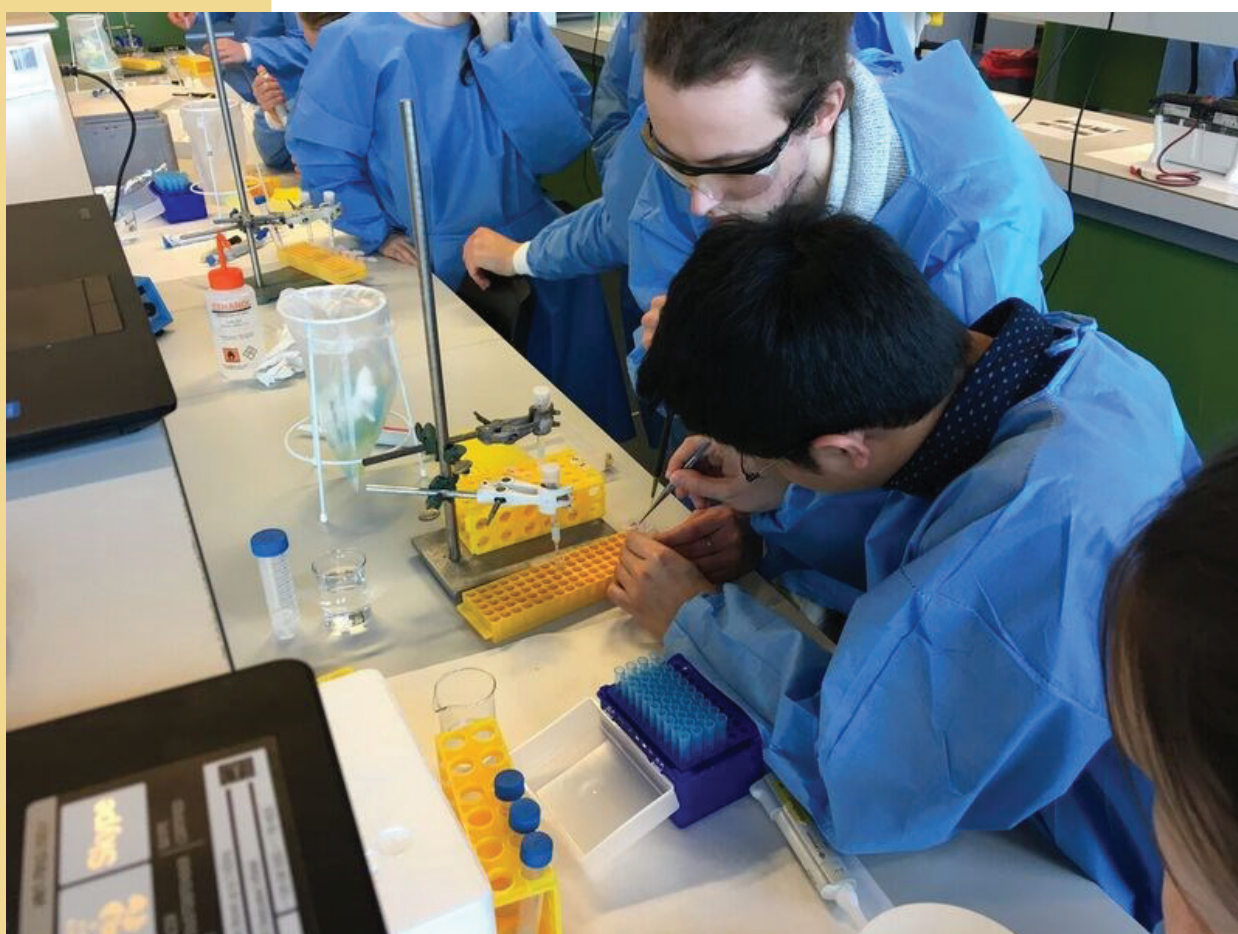
Pharmaceutical Biotechnology

The course Pharmaceutical Biotechnology aims to provide the basic principles of the application of biotechnology for the production of complex protein and nucleic acid-based medicines. It covers the development phase of biopharmaceuticals, including molecular cloning, recombinant production, downstream processing, and formulation. It also touches upon the regulatory issues regarding the registration of such biopharmaceuticals.

In addition, the course aims to train the students in basic lab techniques and good microbiological practices. Students learn to grow bacteria under aseptic conditions and isolate DNA and proteins from cells. Moreover, the students learn the importance of writing a detailed lab report in such a way that the experiment can be reproduced by others.

One Health

One Health is the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals and our environment. It is about seeing the consequences of well-intentioned interventions in one element of the continuum on the other elements and understanding the cause behind the cause of a problem. When properly implemented, it will help protect and save lives in our present and future generations.



Practical part of the course: Pharmaceutical Biotechnology, 2017.

Meet the expert

Name

Anastasios Galanis

Study

BSc College of
Pharmaceutical Sciences
(CPS)



"HPPS is very nice because you can build a very strong network. Your projects add up nicely to your cv, it is not hard to work on these projects because you want to do them, you don't have to!"

What is your favourite course?

My favourite course was neuropharmacology FA-CPS-211 and FA-CPS-213 from Liesbeth, she was also very kind and interested in you as a person. Moreover, those courses are very interesting and all about the brain. You also learn more about animal testing, which is very important for drug development.

Finished project

My first project was a review article on cannabidiol (CBD), which I did at the department of psychiatry at the UMC. I reviewed the literature and the mechanism of action of the drug. It was really nice, however, I didn't expect that it takes so much time and effort but it was really fun and interesting to keep up with the research and CBD. Psychiatry is not a part of the CPS program, so it was hard to find a supervisor for my project. I googled on the substance and found someone who was doing research on CBD. In conclusion, it is very nice because with those projects, you have to reach out to different departments, you get to know people, you make new connections, and people get to know you! This is also very convenient for internships!

HPPS Activities

HPPS organizes a lot of meetings about running projects, but also on interesting topics to broaden your knowledge! Every year, there are 10 meetings, 4 of which are update meetings, 4 thematic events, and 2 social events. During every meeting, there is a nice dinner and the meetings are a nice opportunity to meet other HPPS students.

Update meetings

Update meetings are dedicated to the running and starting projects. Students tell about their projects and what they are doing to gain their ECTS. There are also students who have an idea for a project, and are still looking for members. This is the perfect moment to make other students enthusiastic about your project! In conclusion, update meetings are there to inform other students of your project and to persuade students to participate in your project!



Thematic event: BLS/AED training, April 3rd 2017.

Thematic events

Thematic events are there to broaden your knowledge. A group of students organize a thematic event: they search for an interesting topic in the field of Pharmaceutical Sciences and arrange professors who give a talk on this topic and about their job. It is very nice, because you widen your knowledge about a certain topic and you can see what other scientists do as their job! Thematic events usually have 3 or 4 professors who give a short presentation about the topic of interest.

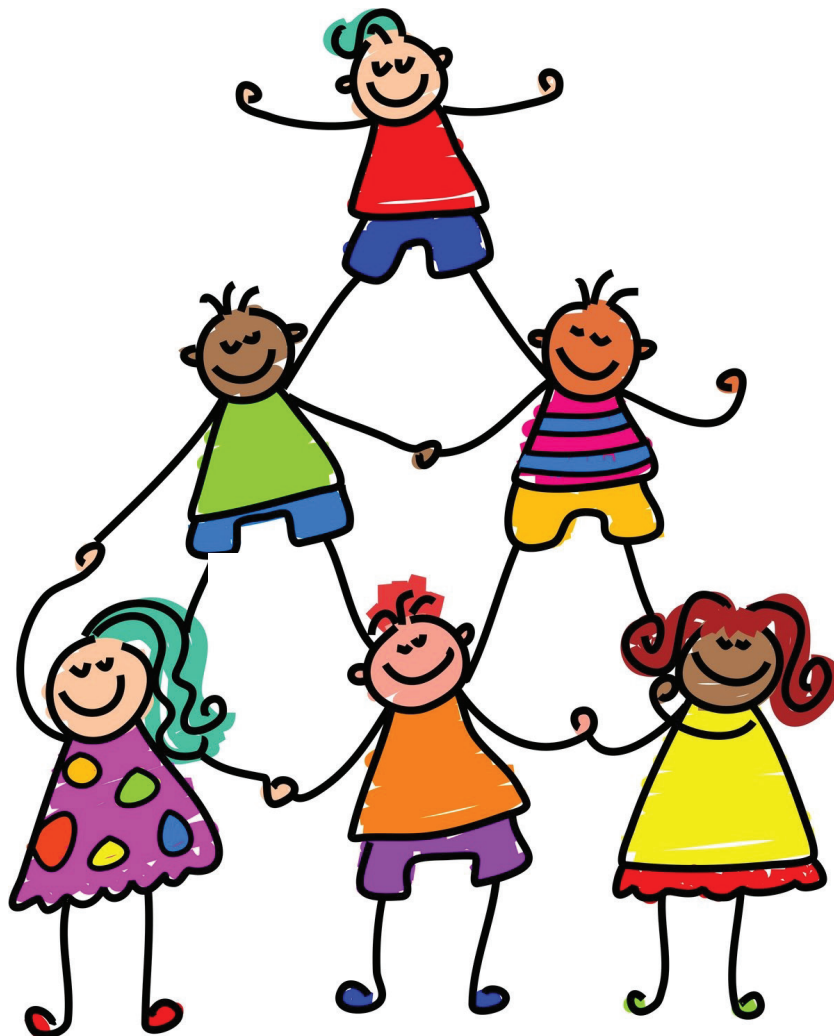
Social events

Social events are focussed on getting to know other HPPS students and having a nice time together. Fun activities are organised such as doing escape rooms, going laser tagging.

HPPS Committees

The HPPS committee provides communication between different honours students, and between students and the coordinator. They keep an overview on what is being organised and done within the Honours group and communicate this to the entire group. They keep track of who is organising events and make sure that every event has a committee assigned. If needed, they provide help. The HPPS committee is also in charge of the agenda. They communicate changes in schedule, and keep an electronic agenda with all relevant (HPPS and SHA) activities. Communication from the committee takes several forms: short updates during thematic events and update meetings, as well as the monthly HPPS bulletin emailed to all students. For more information about the HPPS Committee, you can always contact them: hppscommittee@uu.nl

For every activity that is organized, small committees are formed, so they are different every time. Activities include symposia, thematic events and social events. These committees are formed during update meetings.



The Science Honours Academy (SHA)

Within the Faculty of Sciences at Utrecht University, each study has its own honours programme. Pharmacy has the Honours Programme of Pharmaceutical Sciences; likewise, Biology, Chemistry, Computing Science, Information Science, Mathematics, Molecular Life Sciences, and Physics have their programmes.

Since interdisciplinarity is appreciated at the Faculty of Beta Sciences, all Beta Sciences honours students are stimulated to participate in extracurricular interdisciplinary activities on top of the disciplinary activities. This is where the Science Honours Academy (SHA) comes in: the SHA coordinates the interdisciplinary activities. Every month, a newsletter is sent to all members and all information can be found on the website sciencehonours.sites.uu.nl. Below, you will find more information on the similarities as well as differences between the SHA and the HPPS.

HPPS vs. SHA

	HPPS	SHA
Aim	Further challenge and prepare honours students for a leading role in the field of pharmaceutical sciences	Develop the interdisciplinary skills of honours students
Projects	Freedom and budget for honours students to initiate, perform, and complete their own projects (including update meetings). Examples of projects can be found on page 15.	Standard subjects to which honours students can give their own input and interpretation. Also organised with deadlines.
Organisation	Organised mainly by students. One central student committee/board and several respective committees. More information on HPPS committees can be found on page 9 and information on SHA committees can be found on page 11.	
ECTS	ECTS are used to track progress. They can be earned by, for example, participating in projects, joining committees, and attending symposia.	



Interdisciplinary poster symposium, June 6th 2017.

SHA activities and committees

Within the SHA, like the HPPS, a variety of committees organise a variety of activities. However, the SHA also hosts committees that have responsibilities other than the direct organization of an event. At the beginning of the academic year, the SHA board hosts their introduction event. During this event, anyone who is interested in one or more of the committees is welcome to sign up for the committee(s) of their choice. On this evening all the committees will be presented to you in detail. Below you can read about different activities that the committees organise through the year.

Interdisciplinary project

Per year, two rounds of interdisciplinary projects take place: one during the first semester and one during the second. Students who participate in this activity form interdisciplinary groups of four students and work on a project with an interdisciplinary topic of their choice. The goal is to improve interdisciplinary skills, by writing a paper, making a poster, and presenting the poster.

National and international trip

Two or three times a year, SHA students are invited on day trips to companies or research institutes in the Netherlands. This can be every institute related to the beta faculty. On these trips you can get to know companies from your field, but also from other fields, making it a very interesting experience. Once a year, an international trip is organised. During this trip, which takes approximately five days, you visit academic institutes and research institutes abroad.

Symposia and masterclasses

Four symposia are organised throughout each year. These symposia always have an interdisciplinary theme, and host approximately three different speakers. Masterclasses are organised two or three times a year. During these masterclasses SHA students improve their academic knowledge and skills.

Other activities

But of course, not everything is study related. Excursions are also a regular part of the SHA year, which incorporate cultural activities. Two pub quizzes are organised per year, and on a monthly basis SHA students are welcome at the SHA reception. These are very nice activities in which you can meet other SHA students and have a nice time.



International trip to Prague, April 2017.

Meet the SHA expert

Name

Luuk Muthert

Study

BSc Biology



“The honours programme is a great opportunity to get to know really nice and interesting people, to broaden your horizon, and to develop yourself.”

Why did you choose to do an honours programme and the SHA?

Even though regular courses can be somewhat difficult at times, I missed a general sense of challenge; to be able to work on something other than a simple essay or presentation. I find the Honours projects more meaningful, and, in particular, I like that SHA group members are all equally highly motivated and interested. Currently, I am still very happy to be in the Honours programme, which has allowed me to gain a much broader knowledge of the many facets in biology than I would otherwise have had during the three regular bachelor years of study. I also like that the programme stimulates you to go beyond your own discipline, pursue your other interests, and develop your understanding of the world. For me, this means that I have been given the opportunity to pursue my interest in physics, as I collaborated with physics students.

Why did you become a member of the SHA board?

I was looking for something more challenging than a regular committee. In addition, being in the board of this young interdisciplinary programme provides you the opportunities to help shape it further, for example by starting new activities. Of course, the educational value is great, since you learn a lot about the way in which the university and such a programme function, but the social value is great as well, since it comes down to working together with a small group of friends to achieve your shared goal of improving the SHA.

I would advise you to choose the areas that you are interested in and the ways in which you want to improve yourself. In the end, you will have learnt about the ways in which other disciplines look at the world and science in particular, and that stays with you.

Meet the expert

Name

Pauline Buitelaar

Study

BSc Pharmaceutical Sciences



“There are so many opportunities! When other students present their projects, I really get motivated to think about project of my own!”

Why have you chosen to join the HPPS?

One of my roommates drew my attention to the Honours Programme very enthusiastically, and I found the opportunities in it to fit well with my own ideas about studying. For example, I look forward to getting to know fellow students with the same level of ambition and to working with them; I would very much like to take a step further and go beyond the programme of my study curriculum. Also, I expect to gain a better understanding of current research projects and improve my skills in setting up new projects. So far, I have already really enjoyed the HPPS meetings, where I've met new people, attended inspiring experts' lectures, and had nice meals. Through the presentations on current projects, I've become highly motivated to think about a project of my own. At the moment, I'm considering multiple options: I may start a project from scratch with another student, or join an existing project that I find interesting. In the end, upon completion of the HPPS, I hope that I'll have finished a great project, perhaps even published an article, and spent some time abroad working in an international environment. I'm sure that I'll have enjoyed being in the HPPS and expanded my network!

Meet the expert

Name

Moska Hellamand

Study

MSc Drug Innovation
BSc College of Pharmaceutical
Sciences (CPS)



"My favourite part of the HPPS is the thematic events. They go deep into topics that are not always part of the standard curriculum."

Why did you choose for HPPS?

When I was studying CPS, it was relatively easy to join the HPPS, which seemed like a good opportunity to explore my interests. This has turned out to be even more so than I'd expected and what I like best about the HPPS is how much freedom there is: there are few obligations, but many possibilities to attend events and work on your own projects. Of the meetings, I like the thematic events best, because that's where you learn more about topics that are not always part of the regular curriculum.

Current project

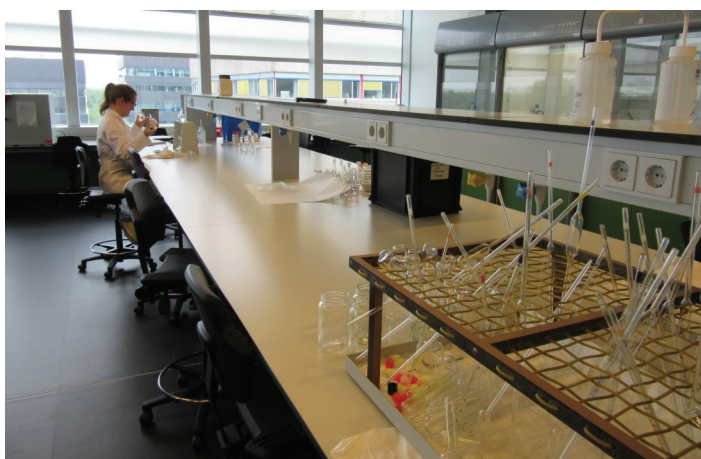
The English Book Project: we're writing a book targeted to high school graduates covering the physiological and biochemical processes in the human body. I joined it when two people pitched their idea of this new project during an update meeting, which immediately seemed like something I'd like to do. The book is coming along pretty well; we expect to have the general chapters complete by the summer, and then we'll hand it over to new students to finish. They will finish the content, and be busy publishing and promoting the book. In June, I'll have worked on it for two years, and I'm considering continuing to work on it. In that way, I could help the new students and make sure that the transition is smooth.

HPPS project examples

In this section, examples of past or current projects are given, from start to finish, and everything in between. A selection of projects was made from different categories for a general impression of the possibilities. In broad terms, the projects can be divided into literature reviews, projects involving practical work, and new initiatives for fellow students.

Literature reviews

The (first) book project is the most well-known HPPS project to date. HPPS students wrote a Dutch book on pharmacy, covering a whole spectrum of topics ranging from research and clinical trials to patient care. The book was a success: it became obligatory literature in the study of 'Farmakunde' at the Hogeschool Utrecht, a reprint was ordered, and the book is still being sold. Following this success, two new book projects were started: one for an even more complete and in-depth Dutch book, and one for a book in English.



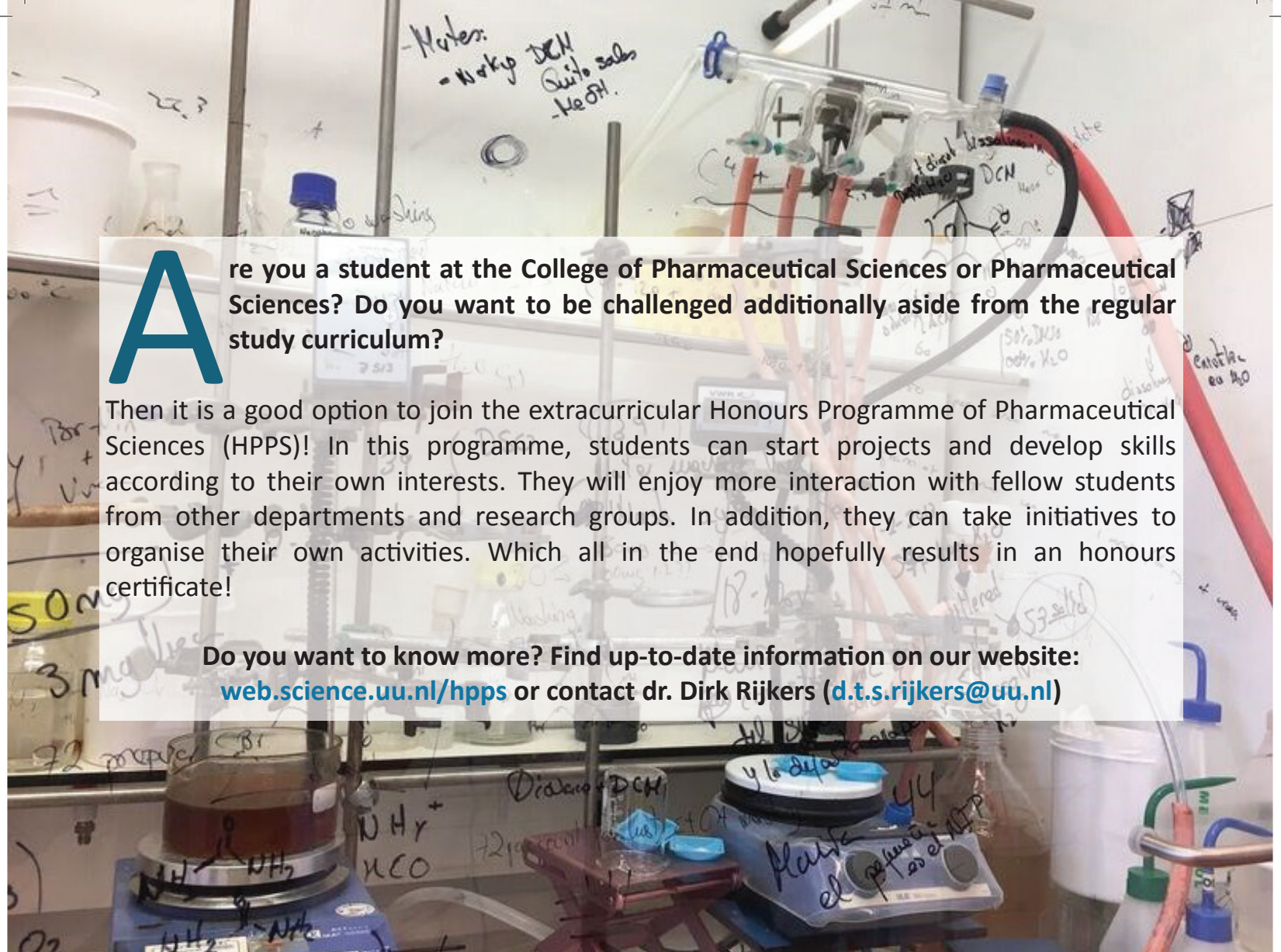
Projects with practical work

An example of a project with practical work is the synthesis of a novel Histone Deacetylase (HDAC) 3 inhibitor.

"This project started as an extension of the last project of the first year in CPS. We developed a molecule that has selective binding for HDAC3 and simulated its properties using powerful tools. In order to confirm that selective binding can occur, we employed AutoDock and AutoDock Vina to dock our molecule to the different HDAC proteins and calculated its binding affinity. Next, we made a few modifications to the molecule to enhance its blood-brain barrier permeability and reduce the production of toxic metabolites. In the end, we constructed a small library of different molecules that have selective binding for HDAC3 but have different modifications. All this work was conducted on computers and we wrote a few reports on the molecules to have evidence to support our idea. Our next step is to synthesise all the different molecules in the lab, purify and calculate their properties and run experiments to see whether our molecules can indeed bind to HDAC3."

New initiatives

As has become clear from the examples above, all sorts of different ideas can result in nice projects. Perhaps somewhat further 'out of the box' are the new initiatives that have been carried out, or are being started right now (spring 2017). The first example of these is the Pharmacy Olympiad. The first Pharmacy Olympiad took place on Tuesday 21 March 2017, and was organised specifically for students of Utrecht University. However, the next editions will be organised for Pharmacy students from the whole of the Netherlands!



Are you a student at the College of Pharmaceutical Sciences or Pharmaceutical Sciences? Do you want to be challenged additionally aside from the regular study curriculum?

Then it is a good option to join the extracurricular Honours Programme of Pharmaceutical Sciences (HPPS)! In this programme, students can start projects and develop skills according to their own interests. They will enjoy more interaction with fellow students from other departments and research groups. In addition, they can take initiatives to organise their own activities. Which all in the end hopefully results in an honours certificate!

Do you want to know more? Find up-to-date information on our website:
web.science.uu.nl/hpps or contact dr. Dirk Rijkers (d.t.s.rijkers@uu.nl)



Colophon

2nd edition, August 2017

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The structure is described as initiated in July 2017. Any changes after that date are not included in this book, so any information in this book given on the structure might be dated at time of reading. Please consult the Programme Coordinator of Pharmaceutical Sciences to get the most updated information.