

## Postgraduate Training & Education Programme in Biomedical Research (PEP-BIOMED)

Building on the measures of the in-house RESEARCH WORKING PARTY (AG Forschung) for the further development of the training of PhD candidates at the Paul-Ehrlich-Institut (PEI) in May 2005, a postgraduate training and education programme in biomedical research (PEP-BIOMED) has been inaugurated at the institute on January 1<sup>st</sup>, 2010. PEP-BIOMED provides attractive qualification opportunities and guarantees excellent supervision as well as detailed and precise assistance to the PhD candidates.

The proposal is designed for students in natural sciences with a diploma or master's degree as well medical students and approbated veterinarians<sup>1</sup>. In the following section, the aims and instruments of the programme are delineated. Further details can be found in:

- Appendix A, Composition & Tasks of the THESIS COMMITTEE,
- Appendix B, Objectives & Support of PhD Candidates,
- Appendix C, CREDIT POINT SYSTEM,
- Appendix D, Guidelines for ADVISORS.

### Objectives

PEP-BIOMED offers a competitive training programme to PhD candidates in the basic research foci of the PEI (virology, microbiology, immunology, allergology, cell and gene therapy) as well as in the areas of biomedicine approval and pharmacovigilance. Following the doctoral degree regulations of the Johann Wolfgang Goethe-Universität (Frankfurt am Main) and the recommendations of the German Science Foundation regarding postgraduate programmes, the regular time frame of individual experimental projects as well as PEP-BIOMED is three years.

Exemplarily in Europe, the PEI unites life science research with the tasks of a regulation authority responsible for biomedicines. Consequently, a part of the learning objectives of PEP-BIOMED is geared towards the unique expertise of the PEI with the aim of preparing young scientists for a career in basic research on biomedicines, drug development and/or drug regulations at universities, research organisations or public authorities and in industry. In agreement with the research programme of the PEI, PEP-BIOMED covers the following life science areas:

- quality, safety and efficacy of biomedicines,
- innovations in experimental therapy and diagnostics,
- immune activation and evasion,
- interactions of host with pathogens and retroelements.

An important aim of PEP-BIOMED is to ensure that PhD candidates working on their dissertation project at the PEI acquire a result-oriented, independent scientific working habit

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<sup>1</sup> Diploma candidates and/or master students as well as students of human medicine, who are preparing a 6 to 12-month thesis at the PEI to obtain a diploma, master's or medical doctor's degree, may attend the courses of PEP-BIOMED, but will not obtain certificate of completion. Medical students working on a three-year dissertation project, however, shall attend PEP-BIOMED regularly. PhD students receiving support within an external graduate school/college programme shall not attend PEP-BIOMED.

as well as the necessary experimental and analytical skills. Therefore, PEP-BIOMED guarantees concrete assistance by the ADVISOR at the PEI and by a THESIS COMMITTEE throughout the entire training period, and supports first publication of the research results by the PhD candidate. A superior training aim is to acquire the skill of working as a team player within a scientific institution.

Moreover, PEP-BIOMED requires and encourages PhD candidates to develop the skills to work without supervision and at their own responsibility. This is based on an unbiased, respectful and science-based interaction at the PEI. In accordance to the Federal Report for the Promotion of Young Scientists (Bundesbericht zur Förderung des wissenschaftlichen Nachwuchses, BuWiN<sup>2</sup>), the PEI guarantees equal opportunities irrespective of gender or disability.

### **Instruments**

PEP-BIOMED operates at an international level and addresses students world-wide. Therefore, written and oral communication occurs predominantly in English.

All PhD students at the PEI are supported by an individual THESIS COMMITTEE while working on their thesis project. This committee gives advice to PhD candidates and supports the progress of the project and the success of the dissertation as well as the publication of the results.

At the RESEARCH PLENUM, PhD candidates have the opportunity to present their work in form of scientific seminar presentations (in the presence of ADVISORS, post-doctoral fellows, and PhD candidates of all research groups as well as other interested scientists of the institute). This forum serves to help acquiring English language skills required for the professional presentation of scientific data in front of a larger audience and to exchange information between the scientists of the PEI.

The aim of the three-year LECTURE SERIES is an accompanying further education in the fields of life science research and regulation of biomedicines. In addition, in-house TRAINING COURSES and WORKSHOPS are available on a regular basis serving the education in the various scientific techniques and methods of the institute. Moreover these courses aim at promoting in-house networking with the utilization of the equipment and know-how of the whole institute.

ADVISORS organize lab meetings, JOURNAL CLUBS and one-on-one meetings on a regular basis. Lab meetings of the respective group are designed for discussing the projects in a specialized environment. JOURNAL CLUBS primarily serve to provide advanced knowledge of the specific literature, but also aim at training the students in a critical review process. Regular one-on-one meetings with the ADVISOR are imperative for the successful progress of the thesis project.

The participation in the different modules of PEP-BIOMED is translated into a CREDIT POINT SYSTEM. From the point of view of the PEI, the successful completion of PEP-BIOMED is a prerequisite for graduation. According to this, PhD candidates shall receive a

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<sup>2</sup> <http://www.bmbf.de/de/12213.php>

CERTIFICATE from the research secretariat certifying the successful participation in PEP-BIOMED in terms of a supplementary qualification.

## Appendix A: Composition & Tasks of the Thesis Committee

The THESIS COMMITTEE is composed of three or four members with experience in instructing graduating students to perform independent scientific work. This includes the ADVISOR at the PEI, a mentor, the division head and/or the president of the institute (if not identical with the ADVISOR). Additional members of the THESIS COMMITTEE could be either the university supervisor or other scientists from the PEI and abroad. The main purpose of the THESIS COMMITTEE is supportive advice on the thesis project with the aim of successful publication. To this end, the THESIS COMMITTEE gives guidance to the experimental work and supports the PhD candidate by unbiased discussion of the progress, the results, and the current state of scientific knowledge in the specific research area. In particular, the THESIS COMMITTEE attempts to assure that the thesis project can be completed within three years and with publishable results.

Immediately after the start of her/his experimental work at the institute, the PhD candidate chooses the members of her/his THESIS COMMITTEE independently and without prior request. The composition of the committee occurs in agreement with the ADVISOR at the PEI and - if not identical - the division head and/or the president. The PhD candidate must inform the RESEARCH OFFICE about the members of the THESIS COMMITTEE not later than six weeks after the beginning of the experimental work.

During the experimental work, the THESIS COMMITTEE meets at least three times with the aim of discussing the scientific results and the experimental planning. These meetings take place at the PEI and are organized by the PhD candidate (fixing an appointment, selection of the location for the meeting, orientation on the programme schedule, etc.).

The first meeting of the PhD candidate with the THESIS COMMITTEE takes place not later than three months after the start of the experimental work at the PEI. This meeting serves to agree upon a hypothesis-driven research project. Accordingly, the PhD candidate shall prepare a written thesis project proposal in the form of a short hypothesis-driven research proposal, which is sent to the members of the committee as well as the RESEARCH OFFICE not later than one week before the meeting. The proposal shall comprise not more than six pages (2500) and include:

- project plan describing the current state of research, preliminary work, hypothesis, aims, and working programme including scheduled milestones,
- information on the collaboration with other groups
- references (bibliography),
- short CV.

If the THESIS COMMITTEE expresses crucial criticism (for example the project is not hypothesis-driven, the extent of the project cannot be handled within the three year time frame, or, a single high-risk project is planned), it can request appropriate revision of the proposal. If this is the case, the RESEARCH OFFICE must be informed. The orientation on the reconciled project plan and possible changes shall be supervised in the future meetings with the THESIS COMMITTEE.

For the second meeting with the THESIS COMMITTEE, the PhD candidate shall prepare a 20 minutes PowerPoint presentation in English as well as respective hand-outs. The presentation shall describe the progress of the work in the form of a seminar talk. Goal of this

meeting is to support the progress of the work and to discuss changes of objectives of the project, if necessary. Moreover, special attention shall be paid to promote a possible publication. The second meeting shall take place in the 17<sup>th</sup> to 19<sup>th</sup> month after the beginning of the experimental work.

The third meeting with the THESIS COMMITTEE focuses on the support with respect to the forthcoming thesis defence. In doing so, the publication of results shall be promoted once again. The third meeting shall take place in the sixth month before the planned completion of the thesis project at the institute.

The THESIS COMMITTEE and the PhD candidate may agree upon an additional meeting if required.

## Appendix B: Objectives & Support of the PhD candidates

PEP-BIOMED supports and requires independent work and personal responsibility of the PhD candidates, at which the major aim of acquiring a PhD degree is the independent publication of experimental results in an international peer-reviewed journal. In this context, the PhD candidates are expected to participate actively in the lectures and courses offered by PEP-BIOMED. Further activities serving education and training such as the independent organization of own scientific events (e.g. organization of workshops and lectures or meetings with PhD candidates from other postgraduate programmes) are supported by the programme. PhD candidates are expected to fulfil all the requirements of PEP-BIOMED in a timely manner without prior request, and to work on their research projects with full commitment.

Immediately after the start of the experimental work at the PEI, new PhD candidates shall register at the RESEARCH OFFICE, where they receive an introduction to PEP-BIOMED and an information package including the personal COMPLETION RECORD and a list of possible candidates for the THESIS COMMITTEE at the PEI. PhD candidates shall keep lists of signatures within their COMPLETION RECORDS, to document regular attendance at PEP-BIOMED. The COMPLETION RECORDS shall be double-checked by the RESEARCH OFFICE every six months.

### RESEARCH PLENUM

In the course of their experimental work at the PEI, PhD candidates shall give lectures at least three times in front of the RESEARCH PLENUM. For each of these lectures, they shall prepare a summary of not more than 200 words. This summary shall be submitted to the RESEARCH OFFICE not later than one week before the date for the lecture. The summary and date of the lecture will then be published in the Intranet. The lectures shall not exceed a time-limit of twenty minutes and are followed by approx. ten minutes of discussion.

The first lecture occurs in the sense of a START-UP SEMINAR and takes place around six months after the start of the experimental work at the PEI. In particular, this lecture shall serve to present the project plan (see Appendix A) and first results, if available. Therefore, the date for the lecture shall be arranged by the PhD candidate in consultation with the RESEARCH OFFICE as early as the start of her/his experimental work at the PEI.

The second lecture occurs in the sense of a FOLLOW-UP SEMINAR and takes place around 18 months after the start of the experimental work at the PEI. This lecture shall present the latest status of the work relating to the project plan. The date shall again be fixed by the PhD candidate in consultation with the RESEARCH OFFICE in a timely manner.

The third lecture occurs in the sense of a FINAL SEMINAR and takes place approximately three months before the scheduled end of the experimental work at the PEI. In particular, this lecture serves to prepare for the thesis defence. Again, it is the responsibility of the PhD candidate to fix the date for this lecture in consultation with the RESEARCH OFFICE and in a timely manner.

## JOURNAL CLUB

During the experimental work at the PEI, the PhD candidates regularly attend JOURNAL CLUBS (approximately every third weeks). In these literature seminars, the PhD students critically discuss the current publications from the specific subject with the assistance of an ADVISOR. These JOURNAL CLUBS are organised by the PEI ADVISORS of PhD candidates on a regularly basis.

## LECTURE SERIES

The three-year LECTURE SERIES is especially designed to further educate PhD students' of the PEI taking into account the unique selling points of the institute. The lectures cover the following subject areas:

- research management basics,
- statistics & systems biology,
- quality, safety and efficacy of biomedicines,
- experimental vaccines, therapies and diagnostics,
- host/pathogen interactions,
- immune activation and evasion,
- procedures of biomedicine regulation.

## COLLOQUIUM

The COLLOQUIUM offers lectures by experienced external scientists and experts on selected scientific and/or regulatory issues. The speakers are usually invited by PEI scientists according to criteria such as excellence and scientific relevance.

## TRAINING COURSES & WORKSHOPS

Within PEP-BIOMED, the PEI provides one- to two-day in-house TRAINING COURSES and WORKSHOPS. The aim is to provide the students with a broad education in the various scientific techniques and methods of the institute. After each course, the participants shall receive a confirmatory signature by the person organizing the course in their COMPLETION RECORD. In addition, the attendance at external further education activities credited in the candidate's COMPLETION RECORDS<sup>3</sup>.

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<sup>3</sup> Attendance of external course or workshop will be credited if a copy of the respective certificate is submitted to the RESEARCH OFFICE. The copy shall be verified by the original.

## RETREAT

The PEI organizes a RETREAT of its scientific staff members on an annual basis. The RETREAT is designed to promote interdisciplinary exchange between the divisions and research groups of the PEI, to initiate critical discussion of selected research projects, and to provide further education in research relevant areas. The PhD candidates take over liabilities for the specific planning and organization of the RETREAT in agreement with the RESEARCH WORKING PARTY. Within this RETREAT, researchers of the PEI and selected scientists of other institutes present their research results and/or research relevant topics in the form of oral and poster presentations. Moreover, three research prizes are awarded at the RETREAT to young scientists of the PEI (PhD candidates or post-doctoral fellows) publishing first author publication during the past year<sup>4</sup>.

## SOCIAL ACTIVITIES

Another aim of PEP-BIOMED is to encourage solidarity among the PhD candidates and to support the further development of their social competence and their skills as team players. Therefore, PEP-BIOMED requires from the PhD candidates to assume SOCIAL ACTIVITIES (for example organizing own courses and colloquiums, co-ordination of leisure activities, taking on voluntary group duties). In some cases, performing an educational duty can also count towards the student's record of SOCIAL ACTIVITY.<sup>5</sup>

## PUBLICATIONS

Capable scientists in the life sciences are qualified to successfully conduct research activities, which lead to a PUBLICATION in an internationally accredited journal. Such activities include the successful preparation and submission of a scientific manuscript as well as the application for research funding. PEP-BIOMED encourages and supports the PUBLICATION of the PhD candidate's own scientific data. The ADVISORS are obliged to provide the necessary assistance; a respective motivation of the PhD candidates is expected<sup>6</sup>.

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<sup>4</sup> Following the RETREAT, the organization team shall submit a list of signatures of the participants to the RESEARCH OFFICE for the purpose of taking into account the attendance at the meeting in the CREDIT POINT SYSTEM. Evidence for the participation in other meetings shall be submitted to the RESEARCH OFFICE by the PhD candidates themselves in order to credit them within the COMPLETION RECORD.

<sup>5</sup> SOCIAL ACTIVITIES are credited by the RESEARCH OFFICE. Therefore, such activities shall be coordinated by the RESEARCH OFFICE beforehand. Recognition in retrospect is usually not possible.

<sup>6</sup> Papers accepted for PUBLICATION must be reported to the RESEARCH OFFICE in order to credit them within the COMPLETION RECORD.

## Appendix C: Credit Point System

The CREDIT POINT SYSTEM supports the PhD candidates in their efforts to participate in a minimum of the training and further education measures of PEP-BIOMED. The following table lists the minimum requirements for a successful participation in the programme.

Elements	Credit points per work	Minimum performance (in three years)	Minimum credit points (in three years)
RESEARCH PLENUM	1	40 of approx. 75	40
JOURNAL CLUB	1	20 of approx 40	20
LECTURE SERIES	1	40 of approx. 75	40
COLLOQUIUM	1	25 of approx. 60	25
COURSES &	15 per course	2 courses or workshops	30
RETREAT & other meetings <sup>7</sup>	10	3 meetings	30
SOCIAL ACTIVITIES	5-15	1 per year	15
PUBLICATIONS <sup>8</sup>	100	1	100
Minimum total credit points l in three years:			<b>∑ : 300</b>

After successful completion of PEP-BIOMED and dissertation at university, the candidates will obtain a CERTIFICATE referencing the acquired additional qualifications. Therefore, it states the measures and courses attended as well as the meetings visited. Moreover, it states the number of credit points reached relative to minimum required for a successful participation in PEP-BIOMED. The candidates shall obtain this CERTIFICATE only after fulfilling all the requirements of PEP-BIOMED and after submitting the final version of the written thesis to the RESEARCH OFFICE. This must be submitted both in a printed hardback form for the ADVISOR and as an electronic version (pdf file) for the library<sup>9</sup>.

If an ADVISOR is already taking care of one or more PhD candidates, their successful participation in PEP-BIOMED shall be a prerequisite for an application for in-house PhD positions in the following years. The successful participation in PEP-BIOMED is also a prerequisite for an extension of the contract of a PhD candidate, which will only be granted in exceptional cases<sup>10</sup>. If PhD candidates of a division fail to participate in the activities of PEP-BIOMED for several times, the division will not be considered for requests of special funds at the end of the financial year.

<sup>7</sup> The minimum requirement is fulfilled if three meetings were attended of which at least one shall be an international conference. In principle, the candidate is expected to attend all RETREATS.

<sup>8</sup> PUBLICATIONS in a peer-reviewed journal with an impact factor.

<sup>9</sup> Under special circumstances, the CERTIFICATE can be granted in retrospect (for example if a scientific PUBLICATION is only accepted after the PhD thesis has been completed).

<sup>10</sup> The regular period of three years for a PhD project at the PEI can be extended by six months maximum under special circumstances (for example disability-related handicaps or illness). A respective application must be submitted to the RESEARCH OFFICE by the ADVISOR not later than three months before the regular end of the thesis project. The RESEARCH OFFICE shall forward the application to the research manager, who will make a recommendation in agreement with the RESEARCH WORKING PARTY. The final decision shall be made by the management of the institute.

## Appendix D: Guidelines for ADVISORS

PEP-BIOMED introduces internationally accepted standards and guidelines for the training and further education of PhD candidates. The respective minimum requirements apply to both the PhD candidate and the ADVISOR at the PEI. The following guidelines shall establish standards for the supervision of PhD candidates at the PEI:

- 1.) ADVISORS shall register a new PhD candidate in PEP-BIOMED immediately at the start of her/his experimental work. Furthermore, it is the ADVISORS's responsibility to ascertain that the new PhD candidate introduces herself/himself in the RESEARCH OFFICE for the purpose of initial instructions in PEP-BIOMED.
- 2.) ADVISORS shall fulfil their duties and obligations as part of the PhD candidates' training in a responsible and professional manner. PhD candidates and ADVISORS shall communicate professionally and respectfully. All research team leaders and division heads of the institute shall support the successful completion of the thesis projects by creating suitable framework conditions.
- 3.) ADVISORS collaborate efficiently with the THESIS COMMITTEE. The aim is the successful completion of both the research project and the thesis defence. The ADVISORS assure the appropriate balance between the regular participation in PEP-BIOMED and the completion of the experiments on which the thesis is based.
- 4.) At the start of the project, the ADVISOR shall ascertain that the PhD candidates are in a position to prepare a hypothesis-based project plan suitable for receiving a PhD degree. The time frame of the thesis project shall conform to the regular duration of a thesis work of three years. The project plan shall meet the general requirements of a short regular research proposal (see Appendix B) and shall be agreed upon with the THESIS COMMITTEE.
- 5.) ADVISOR and PhD candidates have common aims: producing high-quality research results in a specific and PhD relevant project as well as achieving the PhD degree as a general qualification for independent scientific work. Through their support, the advisors assure that the two above mentioned aims can be reached.
- 6.) ADVISORS are responsible for the PhD candidates' regular participation in Journal Clubs (10-15 per year). In addition, they hold regular lab meetings and on-on-one meetings concerning the progress of the projects.
- 7.) ADVISORS shall support the PhD candidates to participate in international meetings and/or external programmes of further education as well as in their efforts to apply for respective funding.
- 8.) ADVISORS actively promote the PhD candidates' development regarding independent scientific work by gradually granting them the necessary freedom to make independent decisions concerning planning of experiments and project management. In doing so, the ADVISORS also support collaboration with other groups at the institute and the co-operation with external partners.

- 9.) ADVISORS shall critically and to the best of their abilities support PhD candidates in their independent preparation of manuscripts and their written PhD thesis.