Establishing an Integrated Research and Training Programme for Clinician Scientists in Parallel to Residency Training

Recommendations by the DFG Permanent Senate Commission on Key Questions in Clinical Research

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1 Summary

Research physicians are essential for clinical research in general, but particularly for clinical research in university hospitals. Yet there has also been a lack of sufficiently visible, reliable and attractive career paths for clinician scientists (synonyms: clinical scientists or physician scientists) for quite some time now. Consequently, we can see that research aspects are increasingly diminishing in importance when it comes to young doctors deciding on their career paths and that research careers in medicine embarked upon by young doctors are aborted at an early stage.

In order to counteract the impeding shortage of qualified research-oriented early career physicians, the DFG Permanent Senate Commission on Key Questions in Clinical Research (Senate Commission, SCCR) believes that the primary objective should be to maintain practising doctors' motivation to conduct research and to develop a qualification for ongoing academic thought and work. As a result, we recommend implementing appropriate mandatory career paths specifically for university hospitals. The aim is to use structured programmes in faculties of medicine to ensure that further clinical training can be usefully combined with research-oriented work and/or with handling research projects at all levels of these career paths.

In this statement, the Senate Commission will use a model to describe how to structure the qualification phase for medical doctors with regard to the research aspect. It will thereby address the key concerns of its statement published in 2010 on "Structuring Research Training for Medical Doctors" (German Research Foundation, 2010). Specific milestones of a model curriculum will also be presented, which should be used as further training to qualify as a clinician scientist.

The Clinician Scientist Programme is aimed at doctors who have undergone the first few years of residency training at a university medical centre and who can show a documented interest in research. University medical centres with strong research backgrounds that can demonstrate a sufficient amount of interdisciplinarity and research infrastructure are envisaged as training locations. Applicants will be admitted into the programme in a transparent and competitive selection process.

Funding for the clinician scientists admitted into the programme is provided for a period of three years and requires them to have an in-depth career plan. The Clinician Scientist Programme also involves compulsory mentoring. Firstly, it will plan the implementation of the clinician scientist's own research project, which requires significant exemption from clinical obligations. The aim is to obtain appropriate recognition of these periods of residency training from the state medical associations. Secondly, the programme will include an accompanying training curriculum, which should contain an equal balance of clinical resident and clinical research subjects. Knowledge of further research and medical training and key qualifications should be imparted within the scope of the curriculum. The success of the programme and of the funding recipients should be assessed using an evaluation based on the three-year funding period.

The funding recipients involved in the programme should receive one half of their financing from healthcare funds (for the clinical part) and the other half from research funds, e.g. provisions for research and teaching or third-party funding.

Ultimately, the careers of clinician scientists must be guaranteed to receive substantial support before and after the phase depicted in the Clinician Scientist Programme. In keeping with this, the programme should be embedded in a general concept with accompanying measures spanning the entire career of the clinician scientists.

2 Background

According to the Senate Commission's use of the term, clinical research covers a wide range of medical research. In an ideal world, research physicians (clinician scientists) embody the integration of its three main characteristics – basic-oriented, disease-oriented and patient-oriented research (German Research Foundation, 1999).

These clinician scientists play a key role in clinical research and are extremely important to all life sciences. As highly trained specialists in all fields of medicine, they are thus important contact partners for technological development and fundamental research. This group of professionals alone also guarantees that pure basic research is combined with clinically motivated basic research in life sciences. Young doctors with academic qualifications are therefore key players in sustaining the innovative capacity of university hospitals and drivers in life sciences as a whole.

However, the situation facing young clinician scientists in particular still constitutes a major challenge and is distinguished by a range of frequently unresolved difficulties. As a result, the problem of combining quality-assured medical and qualified research work is a global and long-known phenomenon. Careers in translational research, which is indispensable and necessary for the healthcare system, have many gaps, require a considerable amount of organisational initiative and are nevertheless exceedingly determined by chance. In Germany, demands for defined and reliable career paths in university hospitals, for better skills acquisition in research, better visibility, acceptance among colleagues and for a more appropriate remuneration of doctors who conduct both clinical and research work were being made even before the DFG's Clinical Research White Paper was published in 1999 (German Research Foundation, 1999) and the joint statement published by the BMBF, DFG and German Council of Science and Humanities published in 2004 (German Federal Ministry of Education and Research, German Research Foundation, German Council of Science and Humanities, 2004), in particular from the sphere of early career researchers in medicine. These demands were once again put forward during the workshop discussion of the Volkswagen Foundation on 27-28 September 2013 in Hanover (Gaehtgens, 2013). In the meantime, the unabated halt in this repeatedly described deficiency is not without consequences. On the one hand, we can currently see that fewer and fewer soon-to-be doctors think that research is an important component when they plan their medical career paths – even in university hospitals (cf. Loos et al., 2014). On the other hand, many professionals who were originally interested in research are leaving the research career path at a comparatively early stage. As a result, we can see a drop in the commitment of researchers aged between 30 and 40 to research achievements and qualifications in parallel to residency training. The associated decline in young clinicians conducting research is a cause for concern, particularly in surgical disciplines and in critical care medicine (Diener et al., 2014; Gittes, 2006). The conspicuously low number of individual proposals from the 45+ age group in the DFG's Medicine review board in comparison to the DFG as a whole indicates this type of abandonment of research careers in clinical science

(Fig. 1). This is an effect that is largely based on the discontinuity of proposals prepared by doctors[1].

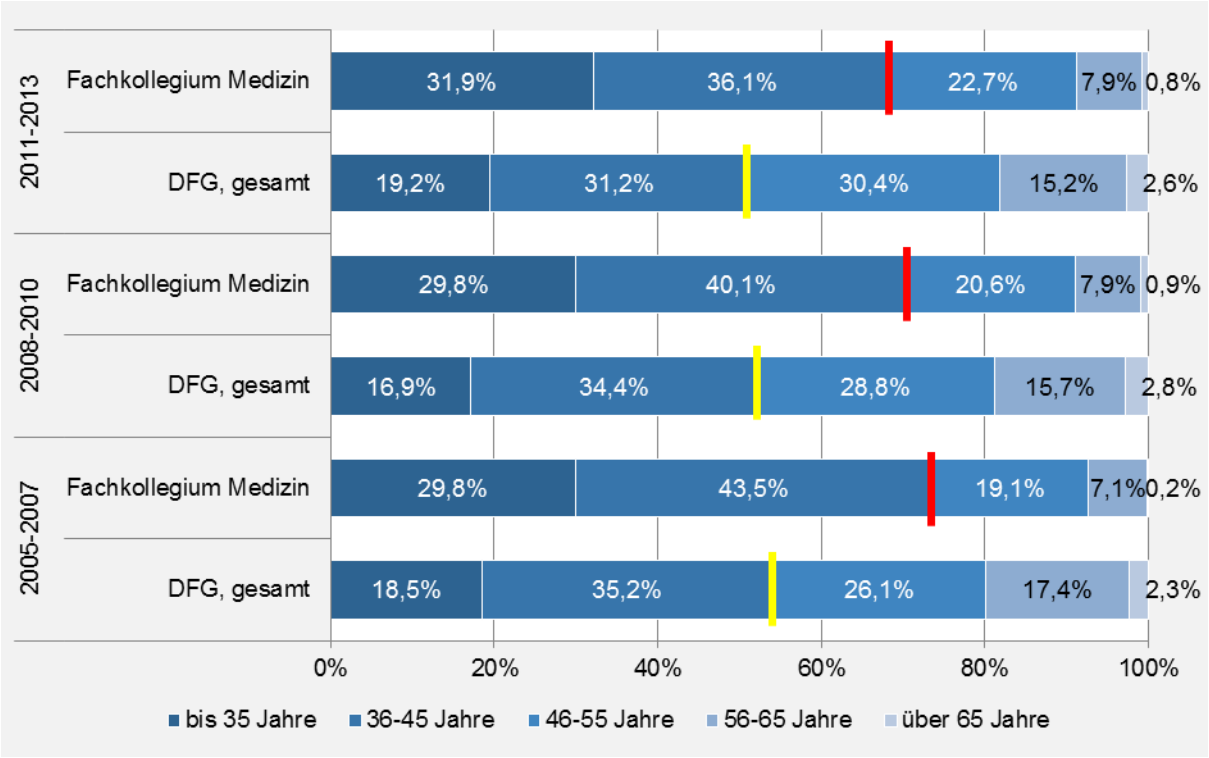

Figure 1
The trend for proposal submissions with regard to the age groups of the applicants in Review Board 205 Medicine in comparison to the DFG as a whole (approved proposals for individual grants). To highlight the comparison, the boundary between the "up to 45" and the "over 45" age groups has been marked separately: a red bar for the Medicine review board and a yellow bar for the DFG as a whole.

A clinician scientist's career faces very specific problem areas here. For example, maintaining a high level of research activity is made difficult because the stage in a clinician scientist's career at which the required research expertise needs to be achieved often coincides with the stage at which residency training begins to be an aspiration and at which starting a family takes priority. In addition, there is a strong monetary incentive underlying the fast attainment of resident status due to the significant increase in pay associated with this career achievement. An assistant medical director position also frequently makes it possible to have more flexible time management to handle a wide range of professional tasks. It must therefore be concluded that in medicine, the career stage in which the researcher should establish his/her own research profile is heavily influenced by the objective of securing further medical training. The professional development of early career researchers in medicine is also impeded by the significant changes in the field of

[1] A random sample of a total of 414 research grant proposals in the Review Board 205 Medicine between the period of 2006 and 2013 was evaluated and revealed that the proportion of medical doctors submitting proposals aged under 40 (approximately 40%) was much higher than the corresponding age group in the other professions (approximately 30%). In the period under review, the proportion of medical doctors among the overall number of applicants was invariably around 50%.

healthcare at the moment. Since the introduction of the DRG-based remuneration system, the same performance criteria used for other responsible bodies also apply to medical work in university hospitals. This is despite the fact that a specific case spectrum has been outlined for university hospitals which clearly differs from other hospitals and despite university hospitals having a very specific training and further education mandate. The urgently required scope for development during duty hours has now reduced for young doctors as well as for senior physicians as natural mentors and funding providers for soon-to-be clinician scientists, not least as a result of the aforementioned remuneration system. As a result, there is often a lack of time for in-depth discussions, patient visits where young doctors learn by way of example, literature reviews (journal clubs), project discussions or study planning. However, the structure of university hospitals has changed here due to the diversity of clinical pictures based on research findings and an increase in clinical (sub-)specialisation. This means that successful, high-quality research requires an increasingly interdisciplinary procedure in multiple locations, which would actually require more time to be spent here. The vital medical specialisation in particular also requires much more reliable continuity with regard to career prospects, which are restricted by this specialisation. Career paths in the specialisation must therefore receive particular protection, which is a frequently neglected leadership task in the day-to-day work of university medical centres.

Table 1 below provides a list of examples of typical disadvantages and restrictive factors for doctors with an interest in research and for their mentors:

Early career researchers	Mentors
Long periods of further training	Economic situation in university hospitals
Increased workload in the medical centre	A lack of time for clinical and research instruction
Wanting to start a family at the same time	Not/no longer able to conduct their own research (if applicable)
"Research positions" not paid in line with a doctor's salary	A lack of regular, structured events due to a lack of time or other priorities when on duty (e.g. journal clubs)
Being enticed by attractive positions outside of university hospitals due to a lack of prospects after completing residency training and a postdoctoral qualification	The pressure to publish
"Dead-ends" in the clinical specialisation career path	

Table 1
Negative framework conditions for high-quality and qualified research-oriented further training for doctors working in university hospitals

It should be noted that most of the negative framework conditions experienced by soon-to-be clinician scientists amass towards the end of residency training and thus have a considerable impact on the personal and professional choices made at this career stage. As a result, these types of programmes, which are repeatedly called for by the German Council of Science and Humanities (German Council of Science and Humanities, 2010, p. 97f; German Council of Science and Humanities, 2011, p. 61; German Council of Science and Humanities, 2012, p. 101f), must be put in place during this career phase. As a result, the Senate Commission is substantiating the proposals on structuring research career paths formulated in 2010 (German Research Foundation, 2010, recommendations 4, 5, 8 and 9, p. 6 and 7) here and implementing this in more detail in the form of a model curriculum. The curriculum outlined below was compiled based on pre-existing examples of training doctors with an interest in research to become clinician scientists. Particularly and explicitly emphasised as model prototypes are the programme for developing the careers of clinical researchers developed within the scope of the Integrated Research and Treatment Center Transplantation (IFB-Tx) at Hannover Medical School (MHH)[2] and the Clinical Scientist Programme conceptualised at the Charité University Hospital in Berlin in the DFG Graduate School GSC 203 "Berlin-Brandenburg School for Regenerative Therapies" (BSRT) (Roth et

[2] http://www.ifb-tx.de/karriere/ (available in German only), 19/02/2015

al., 2011), which was expanded faculty-wide into the “Friedrich Luft Programme”[3] in collaboration with the Volkswagen Foundation and the Charité Foundation.

[3] Described under http://clinical-scientist.charite.de/ (available in German only) and http://www.volkswagenstiftung.de/de/aktuelles/aktdetnewsl/news/detail/artikel/clinical-scientist-programm-startet-an-der-charite-berlin/marginal/709.html (available in German only), 19/02/2015

3 The Clinician Scientist Programme

The Clinician Scientist Programme was developed specifically for the residency training phase. It should be seen as a module embedded in a much broader research and medical qualification and career path. It is recommended that faculties of medicine use this type of Clinician Scientist Programme in the medium term to implement specific further research training for university hospitals. The aim here is to ensure that the key tasks for clinician scientists in university hospitals can continue to be performed by qualified staff going forward (see Table 2 for the programme profiles and programme objectives). The aim of the programme is to create a consistent career path for those who are interested in the clinician scientist role in the long term. We aspire to get the state medical associations across Germany to recognise the curricular elements of the programme as elements of residency training. As a result, this programme differs from pure research periods and medical research within the scope of project funding, which can only be partially credited to further medical training. In the Senate Commission's opinion, making a programme compulsory with fixed agreements between the institution and the funding recipient leads to more reliable career paths, clearer prospects and more independence from changing framework conditions in medical centres. This type of competitive programme in university hospitals also aims to improve equal opportunities as it provides medical centres with resources for specific early career support for doctors with an interest in research.

A Clinician Scientist Programme should receive funding from various sources. However, systematic funding of the clinical part of the clinician scientist's training must be clearly viewed as a task specific to university hospitals because these career paths must be classified as a unique feature of university hospitals and are vital for ensuring the their innovative capacity (cf. Claim 1 of the Statement by the SCCR on structural conditions for clinical research at German universities, German Research Foundation, 2014, p. 2). In the Senate Commission's opinion, the bench-to-bedside approach specific to clinician scientists is required in order to tackle highly relevant issues resulting from basic experimental research that cannot be addressed in the animal model. For example, this includes important questions about the susceptibility to disease-triggering mechanisms and the biological foundations of a particular response to treatment, or a lack thereof.

Clinician scientists' tasks to be guaranteed in university hospitals	**Objectives of the proposed Clinician Scientist Programme**
Implementing and integrating basic-oriented, disease-oriented and patient-oriented clinical research	To create and/or expand upon visible and reliable career paths in clinical research
Working on the most relevant issues that cannot be addressed in the animal model	To guarantee equal opportunities when planning the careers of clinician scientists
Combining pure basic research with clinically motivated basic research	To integrate research and research-related teaching content into residency training
Being a partner for fundamental research	To gain research skills in various clinical (sub-)specialisations
Being a contact partner for technological development	
Ensuring the training and further education mandate at university level	
Ensuring the innovative capacity of university hospitals	

Table 2
Reasons and objectives for research-oriented further training for doctors in university hospitals

Even if the specific conditions set out by various faculties of medicine in Germany were taken into account when conceptualising the proposed Clinician Scientist Programme, we would like to once again refer to the fact that the recommendations can and should be modified in line with the individual prerequisites of the doctors to receive funding and in line with the prerequisites of the various framework conditions at the different locations. There are many different ways to start a career in research, e.g. via international research visits or structures developed internally, which should be taken into consideration accordingly. Due to the heterogeneity of the locations, a flexible adjustment to the model with regard to location specifics or individual candidates is not just necessary, it is explicitly preferable. The realistic overall time that it will take to successfully complete further training and an academic qualification at the same time will differ vastly depending on the discipline. This should be taken into consideration accordingly. Explicitly not affected by the proposed model curriculum are other pre-existing opportunities to combine residency training and academic qualifications that can be implemented through leaves of absence for research periods granted by institutions, integrating international research fellowships into the institution's further training courses, providing funding for rotational positions as part of group research projects or temporary third-party funding for the temporary position for principal investigator within

the scope of individual projects. At this juncture, explicit reference must be made to the German Research Foundation's continuous funding chain (Fig. 2).

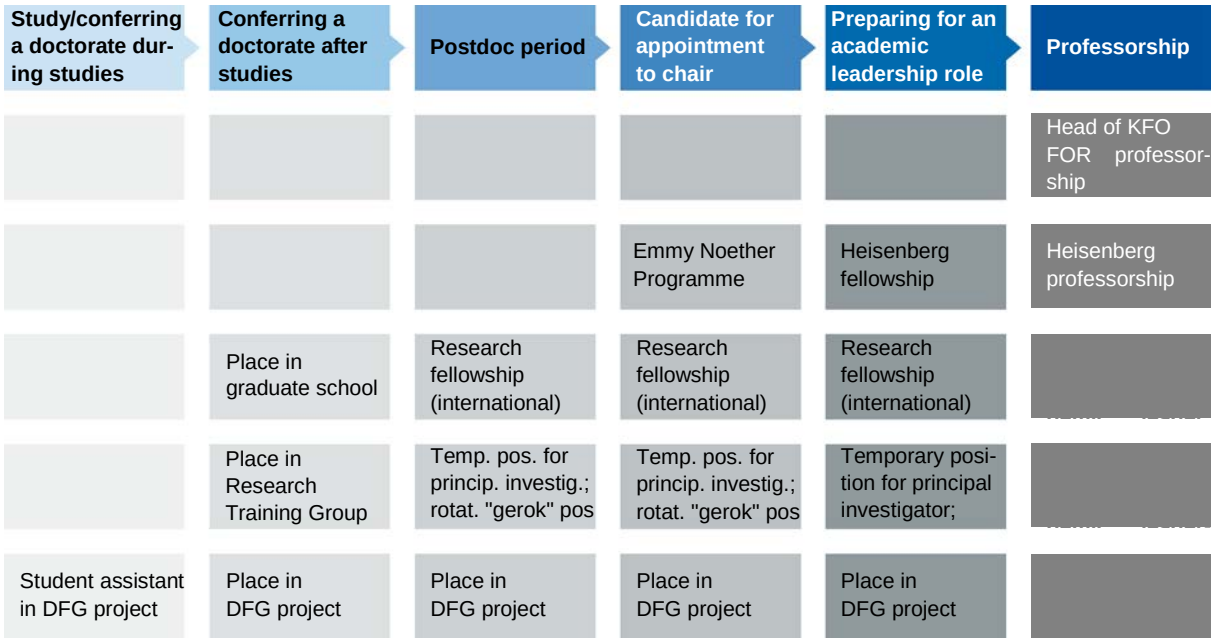

Figure 2
The DFG's funding chain for research careers in medicine.
FOR = Research Unit, KFO = Clinical Research Unit

4 The Programme's Framework Conditions

Institutions

A programme for further training to qualify as a clinician scientist can only be run at a university medical centre in which the director is an appointed, academically renowned and active lecturer at a higher education institution. The medical centre's management board must actively support the programme. The university lecturers involved in the programme must feel obliged to be an active mentor and regularly set aside an appropriate amount of time for discussions with the clinician scientist.

Clinical research is naturally immensely varied, often interdisciplinary and occasionally very challenging when it comes to the experiments. As a result, a Clinician Scientist Programme must allow for the fact that techniques and skills and/or an understanding of these aspects can and must be learned in the fields of molecular biology, cell biology, system biology, model organisms, physics, IT and medical technology, to name just a few. The training location for clinician scientists should facilitate this necessary interdisciplinary collaboration with other research areas.

There needs to be a transparent infrastructure for research – in particular for translational research – including in collaboration with the university's other disciplines at the faculty of medicine that organises the Clinician Scientist Programme. Regulations and structures for adhering to good scientific practice are also prerequisites.

Participants

Those interested in participating in the programme can apply to be admitted and submit funding proposals in a competitive procedure. There are no formal age restrictions. As a rule, the Clinician Scientist Programme is a training concept that runs parallel to residency training. Alternatively, applicants may also be aiming to use this further training to hone their sub-specialisation after having completed residency training. The applicants should be qualified medical doctors who can document an interest in research even after their studies. Most of the residency training should be completed before the applicant is admitted into the programme (e.g. three years, but this may vary depending on the subject area and location). However with regard to reaching resident level within an appropriate amount of time, it is definitely considered desirable if the applicant has already completed 50% to 60% of the required clinical components for the respective field.

Duration

The programme should run for no less than three years. In exceptional cases, completion funding for a further year should be approved if major investigations are required to complete the research project or the applicants are heavily involved in supervising doctoral researchers. We also recommend establishing further tenure track measures following on from the Clinician Scientist Programme that enable research and clinical duties to be combined. Fellowships in line with the Anglo-American model are a particularly good example of this. In order to increase the transparency and reliability of the stated career paths after residency training, we recommend that faculties also work on credible concepts for the later phases of a medical career analogous to the Clinician Scientist Programme.

Structure

The core element of the further training programme is the time set aside for conducting research, which must amount to at least 40% to 50% of the three-year Clinician Scientist Programme. The programme must contain a balance between clinical resident training, the participant's own research project and the clinical research modules in the Clinician Scientist Programme, which are geared towards translational research. For example, surgical fields require reliable planning for clinical training for necessary operations and an appropriate exemption from "non-medical" tasks.

There is considerable flexibility in arranging the non-research time. However, the time spent in full-time research should be chosen in such a way that guarantees the continuity of further clinical training. There are considerable differences between subject areas here. There should also be an opportunity to create a tandem rule for two clinician scientists in the same institution, in particular to ensure the continuity of clinical expertise at the medical centre and the free time for research.

The time set aside for research, clinical rotations and milestones in clinical and research practice are stipulated in writing between the Clinician Scientist Programme and the receiving institution (e.g. medical centre, institute, graduate school) PRIOR TO approval. If the contractually regulated agreements are violated, funds provided for the curriculum may be recalled or funds to extend the curriculum must be provided by the medical facility. In addition to the clinician scientists and their mentors, a programme representative and the staff assistant medical director and/or the medical centre's director should be involved in this process.

The curriculum can be extended due to parental leave; part-time arrangements can be made to improve the compatibility of further training and performing family duties. In these cases, it is also possible to apply for unscheduled funds to ensure that the research project can be implemented, e.g. technical assistance, within the scope of group projects.

Mentoring

As a basic principle, we recommend having more than one mentor in addition to the clinical mentor, e.g. an experimental mentor or a mentor from outside of the university or from industry who is involved with the research, if applicable. All mentors are responsible for training the clinician scientist and supervising their research. Throughout the duration of the programme, continuous feedback from one or more mentors is preferable. At the very least, the mentors should hold biannual feedback meetings with the clinician scientist in order to record the progress of the training. The project and career mentoring part of the Clinician Scientist Programme explicitly does not replace other types of mentoring and can be supplemented with these types.

Curriculum

An accompanying curriculum will be implemented for programme participants. It will be specific to the location and individually tailored to the respective doctor. It consists of a few compulsory modules and further individual optional modules. School-like teaching of the curriculum should be avoided at all costs. The curriculum's timescale will also be stipulated in the curriculum plan in advance. Integrating the curricular offerings into the pre-existing training structures of graduate schools, Research Training Groups and other interdisciplinary group funding instruments is a vital objective in order to avoid duplicate offerings and above all to create the maximum interactivity between semi-clinical basic research and translational clinical research in both directions at an early stage. Bigger locations with a larger number of clinician scientists can develop and offer special programmes. Conceivable offerings include events within the medical centre, e.g. journal clubs, lectures on advanced research training, conference visits, (mini) symposia held at medical centres or even summer schools as well as participation in seminars, courses and symposia with a focus on fundamental research and/or interdisciplinary areas, aimed at safeguarding and expanding upon methodological expertise. A specified and detailed individual arrangement will be made after being admitted into the programme in line with the specific requirements for individual candidates (research methods, subject-specific issues, subject-specific collaborations) and should be closely interconnected with the further clinical training. Sufficient time should remain available for the necessary further clinical training and it should also not impair the participant's medical research. Moreover, we recommend that all clinician scientists working at the same location meet regularly (e.g. once a month) with their mentors for interdisciplinary seminars to establish a network, promote collaborations and receive training in each other's disciplines.

The compulsory modules in the curriculum should be limited to the important fundamentals (ethics, statistics, fundamental principles of clinical trials, good clinical practice, good scientific practice, teaching qualifications, etc.). The associated training programme creates a location-specific profile through certain modules, e.g. on evidence-based medicine, IT or alternative methods to animal testing.

The curriculum's further training modules should be organised into three categories:

- Further research training
- Further medical training
- Key qualifications

An established teaching qualification for the programme participants is recommended for the key qualifications category, because when it comes to uniting research and theory, the group of clinician scientists will be assigned an important role for training students and thus for the long-term funding of early career researchers.

Examples of the subjects of the various categories are listed in Table 3. They may vary depending on the location and the discipline. A location-specific points system similar to the ECTS system can be introduced to assess success. However, this will not be considered compulsory.

Further research training	Further medical training	Key qualifications
Regularly participating in the medical centre's advanced training events	Biometry and epidemiology	Presenting research findings (publications, lectures, posters)
Actively participating in advanced methodology training	Evidence-based medicine	Preparing proposals for third-party funding
Actively participating in a subject-specific multi-day advanced training scheme (summer school/retreat)	Good scientific practice in medicine	Principal investigator skills
Conveying research content to students	Conveying medical decision-making processes and skills	Teaching
Presenting your own findings at congresses, e.g. run by academic associations	Ethics in clinical research	Skills for implementing specific methods, if applicable (e.g. animal welfare, safely implementing genetic methods, the Genetic Diagnostics Act (Gendiagnostikgesetz), radiation protection)
Participating in a (nationwide) meeting of early career researchers/clinician scientists	Residency training	Project management

Table 3 Examples of an accompanying curriculum for a Clinician Scientist Programme

Assessing success/evaluation

A final general evaluation is considered necessary in addition to continuous programme monitoring, which ensures the success of the programme participants, the promised support from the medical centres and the required amount of leave of absence and mentoring. The evaluation of the programme and of the individual clinician scientists should be conducted by a local review committee (e.g. a clinician scientist board) retrospectively over the entire three-year funding period.

The following list of criteria can be used to recognise the success of the further training to qualify as a clinician scientist. It is possible to set location-specific and subject-specific priorities, but it may depend on the assessment by the responsible state medical associations:

- Time spent and material used to recognise residents or a sub-specialisation as well as procedures and operations performed independently (e.g. in cardiology, surgery, etc.)
- Proof of the credits achieved in the accompanying curriculum (ECTS)
- Proof of participation in feedback meetings with a positive evaluation by the supervisor
- Successful (co-)supervised doctorates
- Progression to postdoctoral research
- Publications as first or last author with an assessment of the quality of the publications using various bibliometric factors
- Submitted and/or granted third-party funding proposals
- Individual evaluation of specific academic achievements (such as creating a study concept, establishing a (pre-)clinical model/biomarker platform or effective involvement in new, international collaborations)

Successful completion of the programme is documented in a certificate and sent to the medical associations.

Funding

The funded clinician scientists should be able to successfully complete their residency training after completing the curriculum. As they need a significant amount of clinical practice for this, a corresponding proportion of funding (usually 50%) can also come from healthcare funds. In turn, the periods in which they are gaining an academic qualification should be financed using funds from state provisions or from third-party funding. However if all other prerequisites have been met, admission into further training programmes should be successful, even if it is not possible in an individual case to receive co-financing from the clinical institution for demonstrable reasons and the entire position needs to be funded in the competition, e.g. for central programme funding to be arranged (if applicable). Nevertheless, in the latter case it is vital that the receiving medical centre guarantees the entire further clinical training. If the further training period is co-financed using healthcare funds, there must be a contractual obligation with the medical centre's management board to ensure that time is set aside for research during the curriculum and to continue employment until the participant qualifies as a resident. If the participant is being fully funded by the faculty and third parties, the medical centre's management board must be contractually obliged to ensure the required work and conditions for reaching resident level.

As is the case for the accompanying curriculum, funds from the faculties of medicine and third-party funding can also be used to facilitate medical research (projects). This funding from the faculty covers the core support for the project (rooms, operating costs, funding and staff involved in core support, e.g. study nurses and technical assistants) and half of the clinician scientist's own position. Funds from the faculty or third-party funding can also be used for the costs incurred (course fees, partial travel expenses, etc.) for the accompanying curriculum, which each require separate approval.

Furthermore, it is noted that group funding instruments by the German Research Foundation such as Collaborative Research Centres, Clinical Research Units, Research Units, or other postgraduate instruments for positions to be funded (e.g. rotational positions (cf. Fig. 2)), can be deliberately requested and used to top up an existing Clinician Scientist Programme with more places.

Embedding

The Clinician Scientist Programme is just one component of a consistent career path in university hospitals. Beginning with study and a doctorate, it ensures the necessary time for qualified medical research throughout a number of phases of the researcher's professional career. As a result, the Clinician Scientist Programme presented here (see Table 4) should be accompanied by other training programmes, e.g. a research starter programme for the first three years of training (e.g. with 20% of the time reserved for research), as well as the measures associated with the Clinician Scientist Programme, e.g. clinical and research fellowships used to gain and develop specific expertise that is vital for university hospitals. Even after residency training, time still needs to be reserved for research-oriented practising medical doctors so that they can satisfy the requirements of their own research projects, supervise doctoral researchers and occupy the role of a mentor for young doctors or committed students.

Level of academic training	Position/role	Recommended elements of research
Professorship	• The medical centre's management board • Tandem professorship • Consultant	• Research projects • Mentoring
Postdoctoral study	• Assistant medical director	• Research projects • Mentoring
Resident	• Fellowship • Sub-specialisation • Senior physician in charge of a special unit	• Protected time • Research projects • Independent junior research group
Residency training (5-8 years)	• Starter programme • **Clinician Scientist Programme** • Fellowship abroad • Research Training Group or graduate school • Research fellowship	• Protected time • Mentoring • Integrated research and clinical qualification • Independent research work • Quality assurance
Study & doctorate (6 years)	• MD/PhD programme • Fellowship	• Research modules • Research work

Table 4
Examples of a medical researcher's career path in university hospitals
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5 Composition of the Permanent Senate Commission on Key Questions in Clinical Research

Members of the SCCR	Chair of the Commission	Professor Dr. Leena Kaarina Bruckner-Tuderman, Freiburg
		Professor Dr. Christopher Baum*, Hanover
		Professor Dr. Klaus-Michael Debatin, Ulm
		Professor Dr. Georg Duda, Berlin
		Professor Dr. Steffen Fleßa, Greifswald
		Professor Dr. Gerd Geisslinger, Frankfurt
		Professor Dr. B. Michael Ghadimi, Göttingen
		Professor Dr. Annette Grüters-Kieslich*, Berlin
		Professor Dr. Michael Hallek, Cologne
		Professor Dr. Gerd Heusch, Essen
		Professor Dr. Wieland B. Huttner, Dresden
		Professor Dr. Christine Klein*, Lübeck
		Professor Dr. Georg Peters, Münster
		Professor Dr. Heyo Klaus Kroemer, Göttingen
		Professor Dr. Elke Roeb*, Gießen
		Professor Dr. Michael A. Sendtner, Würzburg
		Professor Dr. Brigitte Vollmar*, Rostock
		Professor Dr. Barbara Wollenberg*, Lübeck
Guests		Dr. Renate Loskill, Berlin
		Dr. Beatrix Schwörer, Cologne
DFG Head Office	The Commission's Support	Dr. Tobias Grimm*, Bonn
The Commission's Scientific Secretariat	Head of the Commission	Dr. Karin Werner, Freiburg

* Members of the working group for support for early career physicians in clinical research under the leadership of Prof. Dr. Annette Grüters-Kieslich

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