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EMBL Conference:
Lifelong Learning in the Biomedical Sciences

Heidelberg, 5–7 July 2016

POSITION PAPER AND
MEETING ABSTRACTS

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The LifeTrain community: *Intrinsic Activity*, 2016; **4**(1):e1
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EMBL Conference: Lifelong Learning in the Biomedical Sciences

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(available online at http://www.intrinsicactivity.org/2016/4/S1)

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published online: 29 August 2016

POSITION PAPER

The Lifelong Learning Conference

Developed by the LifeTrain community*

Summary

The constantly changing and unpredictable biomedical science environment is slowing down the development of better medicines for patients. Having a flexible strategy for both career development and maintaining professional competence is the best way to deal with this challenge.

The EMBL Conference on Lifelong Learning in the Biomedical Sciences was the latest step on a journey to share good practice and to drive the implementation of the LifeTrain principles. The conference was an expansion from a predominantly European, to a broader global focus. It covered career development and continuing professional development (CPD) from: industry; academia; Regulatory; training and policy. Although it was clear that significant progress has been made, there is still a great deal to be done.

In order to deal with the ongoing challenge we need the following:

1. Defragmentation of the activities by development of a stronger global network
2. Incorporation of other parts of the scientific community, especially postdocs
3. Development of harmonised tools, processes, and good practices to facilitate development and maintenance of more high-quality competency profiles
4. Implementation of transformative learning that leads to competence
5. A forum for sharing emerging ideas and practices, *e.g.* an annual conference

Position paper

LifeTrain is an open community working together to build a coherent framework for continuing professional development (CPD) across all career stages in the biomedical sciences [1]. It is based on the premise of, *"No research without trained researchers"*. Thus, every professional needs to develop and maintain an optimal level of competence to contribute to the development of better medicines for patients. This flexible strategy is the only way to deal with the constantly changing and unpredictable environment. The education and training of academic scientists and professionals, their ability to work in multidisciplinary teams and to communicate with the public has even broader ramifications since society as a whole needs the innovations from science.

LifeTrain emerged from a series of workshops where the stakeholders (employers, professional/scientific bodies, Regulators, course providers, and individual professionals) developed the key messages, principles, benefits, case studies and a database of examples of competency profiles. Many of the workshop participants became "Signatories" of LifeTrain; agreeing to continue to work together to help in its implementation.

Competencies and competency profiles have emerged as the "currency" of continuing professional development, allowing tailored programmes to be designed, and supporting mobility across geographical, sectoral and discipline boundaries. In conjunction with LifeTrain, a number of groups have developed competency profiles. These include: the Specialist in Medicines Development (PharmaTrain–IFAPP), Safety Scientists (imi-train), Research Infrastructure leaders and technical staff (CORBEL and RItrain), researchers in translational science (C-COMEND), and Bioinformatics core competencies (International Society of Computational Biology). Other profiles already existed and are included on the website, *e.g.* Regulatory Affairs (TOPRA), core competencies for Clinical Research Professionals (IAoCR and the Joint Task Force for Clinical Trial Competency) and Guidance on CPD for Qualified Persons (EIPG). Examples of certification processes can also be found on the website, *e.g.* the European Register of Toxicologists (EUROTOX) and European Certified Pharmacologists (EPHAR).

The Lifelong Learning Conference

The EMBL Conference on Lifelong Learning in the Biomedical Sciences was the latest step on a journey to share good practice and to drive the implementation of the LifeTrain principles. The conference was an expansion from a predominantly European, to a broader global focus. It covered continuing professional development from: industry; academia; Regulatory; training and policy.

The four main themes were: Stimulating inter-sectoral mobility; Fostering competency and inter-disciplinarity; Developing cross-cutting skills and Transformative learning: applying learning in the workplace. Optional workshops were held post conference enabling participants to apply concepts highlighted in the four sessions. The programme and presentation materials can be found on the website [2].

Evidence presented showed that although gaining a tenure track position is seen as the aim of PhD and postdoctoral training, in reality it's an alternative career. Therefore, we need to talk more openly about the wide variety of career options and provide the support to enable informed career decisions and training. Examples of such support came from both the USA and Europe. We heard about many different approaches to training the emerging or established professional in the workplace, including: face-to-face, e-learning, and on-the-job, for the individual and for the multidisciplinary team. This could be summed up as, the right training to the right people at the right time. There were inspiring examples of how great scientists can become great leaders and how employer commitment to training and development can produce measurable impacts, and a more skilled and loyal workforce.

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To drive this message home was an anecdote (from Simon Brown):

Question: *"What happens if we train our people and they leave?"*

Answer: *"What happens if we don't train them and they stay?"*

We also learnt how the highly collaborative nature of current scientific research in academia and industry is breaking down barriers to mobility between sectors. The discussions during the Conference, and the Conference itself, demonstrated that we are communal "animals" and thrive on face-to-face contact and there was overwhelming support to continue in a similar forum.

Despite a number of excellent initiatives and success stories, it was clear that there is still a large amount to be done and barriers to be overcome. Strong communication between stakeholders to share good practice is needed to avoid the danger of reinventing the wheel. Competencies are still not well understood and are not yet universally established as a "global currency". There is a need to establish best practice for the development and maintenance of competency profiles. Although each individual is responsible for his/her own career, the scientific community has a responsibility to support them, and society needs the innovation that only science can provide.

Next steps

We have a solid foundation but need to continue to build until we reach the point where all of the above become part of the fabric of the scientific culture and can then continue to evolve. In order to achieve that we need the following:

1. Defragmentation of the activities by development of a stronger global network
2. Incorporation of other parts of the scientific community, especially PhDs and postdocs
3. Development of harmonised tools, processes, and good practices to facilitate development and maintenance of more high-quality competency profiles
4. Implementation of transformative learning that leads to competence
5. A forum for sharing emerging ideas and practices, *e.g.* an annual conference

We invite other members of the biomedical community to join the community of LifeTrain signatories and support these aims.

Links:

1. http://www.lifetrain.eu
2. http://www.lifetrain.eu/join-us/embl-lifelong-learning-conference-2016/

MEETING ABSTRACTS

Introduction and Keynote Lecture

A0.1

Introduction

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Intrinsic Activity, 2016; **4**(Suppl. 1): A0.1
http://www.intrinsicactivity.org/2016/4/S1/A0.1

The IMI Education and Training projects, led by EMTRAIN, have been involved in supporting continuing professional development for all scientists working in the area of medicines development for the last seven years. The solution to dealing with the continuously changing environment has been, "every professional working in the area of medicines development needs to develop and maintain an optimal level of professional competence". The LifeTrain strategy was developed in conjunction with the major stakeholders, most of whom are signatories to LifeTrain, and has resulted in the website [1] dedicated to supporting these activities. The framework document, the principles, the publications and competency-profile database are all the result of a series of workshops held between 2011 and 2015, and this work is now culminating in this first, open, conference on "Lifelong learning in the Biomedical Sciences". By expanding to a global audience, and sharing best practice from around the world, we are taking the next bold steps in the journey to speed up the development of better medicines for patients.

Link

1. http://www.lifetrain.eu

A0.2

Fixing the broken academic career pipeline

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Intrinsic Activity, 2016; **4**(Suppl. 1): A0.2
http://www.intrinsicactivity.org/2016/4/S1/A0.2

Distressed by the perverse incentives that have generated the current hyper-competitive biomedical research environment in the United States, four of us published an open-access article in April 2014 [1]. As announced in a follow-up piece [2], we have formed a steering committee to oversee a new website [3] that is designed to collect suggestions for actions that can ameliorate the identified problems, as well as to identify promising changes that are either underway or proposed. We are encouraging many groups to contribute to this effort.

Despite widespread agreement concerning the problems, any substantial change in the system is bound to be controversial. Experiments are therefore needed. In my talk, I will outline some possible ideas for overcoming the inertia that prevents moving forward.

References and link

1. Alberts B, Kirschner MMW, Tilghman S, Varmus H: **Rescuing US biomedical research from its systemic flaws.** *Proc Natl Acad Sci USA,* 2014; 111(116):5773–5777. doi:10.1073/pnas.1404402111
2. Alberts B, Kirschner MW, Tilghman S, Varmus H: **Opinion: Addressing systemic problems in the biomedical research enterprise.** *Proc Natl Acad Sci USA,* 2015; 112(7):1912–1913. doi:10.1073/pnas.1500969112
3. http://www.rescuingbiomedicalresearch.org

Session 1:

Stimulating Inter-sectoral Mobility

A1.1

Learning to innovate: how do we turn scientists into industrial innovators?

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.1
http://www.intrinsicactivity.org/2016/4/S1/A1.1

There has never been a more exciting time to work in Biomedical Sciences. Rapid technological advances in science are opening up new avenues for researchers. For example techniques such as high throughput sequencing and the use of CRISPR for genome editing now enable scientists to get a better handle on the aetiology of disease. These techniques either supercede or compliment existing techniques and scientists are constantly having to update their skill set through continuous professional development (CPD) activities.

Furthermore, some of the scientific challenges are so large that no single organisation has all of the expertise and capability to tackle the challenge on their own. This has resulted in collaborations being forged not only between industry and academia but also business to business. Often skills shortages may be addressed by sharing best practice across different organisations and through the mobility of researchers who then transfer expertise and knowledge "on the hoof".

This talk will highlight examples of strong collaborations and the value of early-stage researchers straddling the industry-academe axis. It will also discuss innovative models where new knowledge has been created from disparate collaborator sources.

A1.2

Returning to academia after a career in big Pharma

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.2
http://www.intrinsicactivity.org/2016/4/S1/A1.2

Professor Neil Carragher graduated from the University of Aberdeen, Scotland UK in 1992 with a B.Sc. Honours degree in the subject of "Cell and Immunobiology". He then took up a position within industry at the Yamanouchi Research Institute (now Astellas Pharma Inc.), Oxford, England, UK, where he also gained his PhD. He then held consecutive academic postdoctoral positions within the Department

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of Pathology, University of Washington, Seattle, USA and at the Beatson Institute for Cancer Research, Glasgow, Scotland UK. In 2004 Neil returned to the pharmaceutical industry as Principal Scientist with the Advanced Science and Technology Laboratory at AstraZeneca where he pioneered early multiparametric high-content phenotypic screening approaches. In 2010 he once again made the career switch from industry to academia and took up the post of Principal Investigator of Drug Discovery at the University of Edinburgh where he leads a research group and is currently co-director of the Edinburgh Cancer Discovery Unit and the Edinburgh Phenotypic Assay Centre. In 2015 Neil was appointed the Personal Chair: Professor of Drug Discovery at the University of Edinburgh. He is also Chief Scientific Officer of the Phenomics Discovery initiative [1], a public–private consortium to advance phenotypic screening technologies, and is a founding member of the European Cell-based Assay Interest Group [2] and global RPPA society [3]. In his presentation Neil will describe his career path transitioning between industry and academia, highlighting specific science projects, roles and responsibilities and strategic initiatives he has been involved with. He will also present a personal view of his experience of the cultural and professional differences between academia and industry sharing personal learnings and anecdotes from a career path that crosses the boundaries of academia and industry.

Links

1. http://npsc.ac.uk/pdi
2. http://www.eucai.org
3. http://www.nmi.de/rppa2016/

A1.3

Fostering mobility in the research community

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.3
http://www.intrinsicactivity.org/2016/4/S1/A1.3

Since 2007 the world population of researchers has risen by 21% to a total of 7.8 million with the highest proportion in the EU (22.2%). However the total number of academic and research positions has not kept pace with this trend. There is increasing pressure on researchers by governments and funding agencies to engage in knowledge transfer through intersectoral and interdisciplinary mobility. This is in contrast with universities seeking higher rankings and pressuring researchers to focus exclusively on high impact publications. As a consequence any researcher wishing to move from the non academic sector or with an unusual career path will find it very difficult to get an academic position. On the other hand the non-academic sector only sees researchers as mere academics. These are major challenges to intersectoral mobility. European researcher career policy is now looking at the development of a broader form of career recognition that goes beyond the narrow high impact factor. The current focus is on recognising researchers who engage in Open Science.

A1.4

Combining breadth with depth: validation of competencies in clinical research and medicines development

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.4
http://www.intrinsicactivity.org/2016/4/S1/A1.4

Two distinct groups—from IFAPP–PharmaTrain and the Joint Task Force for Clinical Trial Competence (JTF) including representatives from professional associations, academic institutions and pharmaceutical companies—devised a set of core competencies (CCs) for clinical research professionals (cognitive level) and those involved in pharmaceutical medicine / medicines development (knowledge, skills and behaviors). The JTF conducted a multinational digital survey aimed to validate its previously published framework among 1,738 clinical research professionals. Participants self-assessed their perceived competence level and the relevance of 8 domains and 51 core competencies to their current professional activities as well as their perceived need for further training to enhance performance quality. Significant differences in the perception of competence and relevance for the role were observed. Interestingly, most respondents regarded competencies included in the domains of Scientific Concepts and Research Design as well as Medicines Development and Regulation, as having low competence and relevance. These results suggest that the lack of educational requirements and the current "on the job" training model for the clinical trials workforce might not be appropriate any longer. However, further confirmatory studies are necessary. The IFAPP CCs (7 domains and 57 competencies) have been endorsed by 30 National Member Associations. Exploratory validation initiatives are currently underway.

A1.5

Helping scientists play to their strengths

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.5
http://www.intrinsicactivity.org/2016/4/S1/A1.5

It's an exciting time to be in science with an explosion in the development of new technologies and approaches to fundamental questions, especially in biology. At the same time, the path to a rewarding career can be bewildering to graduate students and postdoctoral fellows. An individual development plan (IDP) can bring clarity to the process by assisting young scientists think more broadly about their careers and helping them develop specific goals for developing requisite skills for their desired career path. This talk will briefly describe the process for creating an IDP and discuss how institutions can support the process by facilitating training in essential competencies.

A1.6

How to foster transformative learning that is sympathetic to scientists' conflicting priorities: training "on the job" or "for the job"—a dilemma?

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.6
http://www.intrinsicactivity.org/2016/4/S1/A1.6

Background: In Life Sciences, the required knowledge and competencies are ever changing, making lifelong learning a term known to any professional. However, this creates the dilemma how to integrate continuous education and learning in the also continuously more condensed workday. Another megatrend impacting ongoing learning is the globalization of daily work. Staff has to be consistently trained across the globe. With labour costs being reduced through off-shoring, the costs of training need to be aligned with such cost-saving measures.

Method: The costs and impact of three different transformative learning activities which are intended for "Training on the job—for the job" are presented and compared: (a) a two-years post-graduate MSc course in Pharmaceutical Medicine at University Duisburg-Essen,

accredited by IFAPP and IMI PharmaTrain Center of Excellence; (b) an eight-months accredited training program "Drug Safety Academy", developed by ICON in collaboration with International Academy of Clinical Research (IAoCR), UK; (c) a six-weeks Project Management course, developed by ICON in collaboration with the International Institute of Learning (IIL) and evaluated by Corporate Executive Board (CEB).

Results: The three different models for training have significantly different cost implications and capacity: (a) Input: net costs of 14,850€ for full two years plus travel expenses to attend in person 19 course units, 3 days each. Output: an internationally accepted Master Degree (European Qualification Framework, EQF, Level 7). Throughput: 26–30 students every 2 years; (b) Input: 8,500€ annual base fee plus 450€ per certified student plus internal investment of 1.5 FTEs for 5 HC trainers and one coordinator. Total costs for 173 staff enrolled over 1.5 year: 264,850€ or 1,710€ per each of 155 completers within 1.5 years. Output: 6 credits for job competency at EQF Level 3. Throughput: 100 safety associate staff per year. (c) Input: 2,100€ costs per attendee. Output: an internal certificate. Throughput: 259 junior Project Managers in 2015. The fully accredited course like (b) did not differ in costs, but was limited in throughput. The outcome measures for (b) and (c) both revealed that staff performance and client satisfaction increased.

Conclusion: The data indicate that training "on the job" as detailed in (b) and (c) is a concept that adds value and is also accepted by staff. A more substantial training as in a Master Course will in contrast only remain a solution for a limited number of highly committed individuals.

A1.7

Postdoc careers in the spotlight: a bottom-up approach to improve support for Austrian postdocs

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.7
http://www.intrinsicactivity.org/2016/4/S1/A1.7

The current research workforce largely depends on the continuous supply of cheap PhD students and postdocs. Most scientists reflect on their career plans and trajectories at this latter stage and consider a plan B for survival outside of academia due to highly competitive funding programs and a lack of available faculty positions in academia. Postdoctoral fellows besides the experimental tasks, they assume additional responsibilities from their superiors, like grant and paper writing, supervision, administrative tasks, teaching and many more. Despite this heavy professional workload, postdocs face short-term contracts, less social benefits and appreciation for their multifaceted contributions to the research enterprise. In addition, postdocs often lack opportunities to develop and recognize skills that enhance their employability in non-academic careers, leading to career uncertainty, a lack of confidence in making career transitions, and the prospect of unemployment. Moves have been made to track the careers of postdocs who leave academia, and to provide opportunities to develop soft skills in addition to research work. However, in most countries these initiatives are still premature. In Austria, we have taken a bottom-up approach to tackle career difficulties faced by postdocs. We launched our initiative with a short survey data, which we presented to different stakeholders describing the status of postdocs in institutes in the Vienna area. Feedback and support from these parties has since helped us to develop a structured program to analyze the career perspectives of early stage researchers in Austria and to plan future initiatives to improve career development support. The program that will be carried out in the next half a year includes the organization of two workshops, an evaluation of career coaching methods specifically aimed at postdoctoral researchers, and will gather data of the current career paths to help scientists to make conscious career choices.

A1.8

Study visit in Germany as a tool for mobility stimulation and continuous learning enhancement from Venezuelan science students and faculty members

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Intrinsic Activity, 2016; **4**(Suppl. 1): A1.8
http://www.intrinsicactivity.org/2016/4/S1/A1.8

Study visits allows for valuable learning experiences outside the classroom; however, its planning and execution are not trivial, and sometimes budget and convincement of local authorities about the need of this type of activity may jeopardize the whole experience. Despite these challenges, a carefully planned and integrated study visit offers tremendous learning potential for all participants. Our study visit in Germany was a short stay for two weeks for a mixed group of undergraduate and graduate students and also faculty members, financed by the German Academic Exchange Service (DAAD). Study visits were performed in 2009, 2012 and 2015, and included short presentations and visits to specialized departments and industries in the biochemical branch. Educational/training institutions like EMBL, DKFZ, UFZ, Charité and Max Planck Institute, as well as several universities with special focus in biochemistry, microbiology, genetics and biotechnology were visited. These activities allowed a forum for discussions, initiated idea-exchanges and promoted learning, with an international scope. Study visits constitute an excellent opportunity to support continuous education and improve scientific cooperation with Europe. This mechanism may be adapted for other scientific scenarios (industries or federal offices). The study visit allowed the University of Carabobo to increase staff motivation and its internationality.

Session 2:

Fostering Competency and Interdisciplinarity

A2.1

Pharmaceutical industry: a unique environment for continuous scientific learning

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.1
http://www.intrinsicactivity.org/2016/4/S1/A2.1

The pharmaceutical industry, in particular in research and development offers a unique environment to develop a strong scientific career. We will review how a scientist can further deepen their scientific skills in their choice of discipline as well as access learning in different scientific fields and disciplines in multifunctional teams. Also of importance is the opportunity to both learn and teach scientific skills while part of a research department. The process of drug discovery and development equally represents in itself a scientific learning opportunity drawing from both fundamental research and more applied technologies. Finally, we will discuss the options the pharmaceutical industry offers to evolve a fulfilling scientific career into different roles and disciplines that draw from all skillsets that can be acquired throughout a career.

A2.2

Using core competencies to develop a bioinformatics training programme

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.2
http://www.intrinsicactivity.org/2016/4/S1/A2.2

H3ABioNet [1] is a Pan-African Bioinformatics Network which aims to build bioinformatics capacity to enable genomics research on the continent. One of the activities of H3ABioNet is the development of education and training programs to build the next generation of bioinformatics users and bioinformatics scientists. Since bioinformatics degree programs on the continent are still rare, an African Bioinformatics Education Committee was established during a degree development workshop in Botswana in 2014, which sought to provide guidance on the development of such programs, including recommended curricula and outline processes for establishing and costing new degrees. We started by defining the core subjects bioinformaticians should be exposed to, based on several publications by the ISCB and others. We then developed a set of core and elective modules with suggested content, contact hours, assessment method, etc. These are being mapped to a core competency framework developed by international groups, such as the ISCB. Our curriculum has been implemented in two new Masters degree programs in Mali and Malawi. Using a similar method, but starting from the core competencies and using the Edison framework, we are currently developing a new curriculum for genomic medicine appropriate for African institutions.

Link

1. http://www.h3abionet.org

A2.3

The EPHAR/EACPT European Certified Pharmacologists Programme (EuCP): update 2016

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.3
http://www.intrinsicactivity.org/2016/4/S1/A2.3

The European Certified Pharmacologists (EuCP) Programme was launched in July 2014 by the Federation of European Pharmacological Societies (EPHAR) with the intention to identify experts in the field of pharmacology whose competency profile, in addition to their personal specialised scientific expertise, covers expert knowledge in all major fields of the discipline. Seventeen EPHAR member societies have declared their active participation in the EuCP programme so far (Austria, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Serbia, Slovenia, Spain, Turkey). EACPT, the European Association of Clinical Pharmacology and Therapeutics, declared its participation in the EuCP Programme in July 2015.

Two EPHAR member societies (Italy and Austria) have submitted certification schemes, which were already approved by the EuCP Programme. The programmes differ in structure and reflect the flexibility of the EuCP Programme with respect to the respective national conditions. The Italian programme is based on a catalogue of criteria; applicants have to certify and document their expertise on the basis of this catalogue. The Austrian programme is based on a legally regulated medical specialisation in pharmacology and toxicology (separate schemes for non-medical pharmacologists shall be submitted in the future). The Pharmacological Societies of the Netherlands, Germany, Switzerland and Spain are currently preparing submissions: the Dutch programme is based on a PhD curriculum in pharmacology; the German program is based on a program for continuing professional development in pharmacology. Thus, these first submitted national programmes can also serve as 'case studies' for other participating member societies to develop their national EuCP rules. Approved national EuCP programs are published on the EuCP website [1].

Link

1. http://www.eucp-certification.org

A2.4

Bridging structural and systems biology through academic and industrial career experiences

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.4
http://www.intrinsicactivity.org/2016/4/S1/A2.4

I studied in Barcelona, where I earned my PhD in 2000 in the field of DNA crystallography. I did my postdoc at the EMBL Grenoble in the structural biology of transcriptional signaling. In 2005 I returned to Barcelona to join a new drug discovery biotechnology company, Crystax Pharmaceuticals (now owned by Oryzon Genomics). In 2006 I became Head of Structural Biology, where I managed a team engaged in the structural analysis of pharmaceutical targets and lead compounds. In 2008 I returned to academia to become Director of the Experimental Bioinformatics Laboratory, a joint initiative of the Barcelona Supercomputing Center and the Institute for Research in Biomedicine. There I was responsible for the set-up and operation of the lab, mentoring and co-supervising 11 researchers working on diverse projects in the field of systems biology. Seeing an exceptional opportunity to combine two research disciplines—systems biology and structural biology—I returned to Grenoble in 2014 to take up a position at the European Synchrotron Radiation Facility (ESRF) as Scientist responsible for the Structural Biology Laboratory. In addition to co-supervising and mentoring the laboratory's 18 research members, I lead an independent research team that investigates Alzheimer's pathogenesis using both large-scale biology and structural approaches.

A2.5

on-course®: a research and visualisation tool for gathering and analysing lifelong learning opportunities in biomedical sciences

Pavel DALLAKIAN[1,*], Christa JANKO[1,2], Claire JOHNSON[3], Mike HARDMAN[4], Anthony PAYTON[5], Klaus WASSERMANN[1] and Michael WOLZT[1]

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.5
http://www.intrinsicactivity.org/2016/4/S1/A2.5

on-course® [1] has proven to be a helpful tool for career development in biomedical sciences. The structured data gathered in on-course® allows us to investigate the pan-European biomedical education and training landscape. Here we present how, by means of an API (application programming interface), on-course® data can be visualised in statistical charts and graphs which are easy to read and understand. By means of a visualization API on-course® data

(collected and updated between January 2010 and April 2016) was analysed and visualised. We observed an increase of English-medium learning opportunities in Europe. This increase correlated with student and staff mobility. We also show the distribution of courses by tuition fees grouped by categories. Here we show substantial inter- and intra-country variation with masters course tuition fees for students ranging from less than 500 to 25,000 Euros. Using our tool users can create similar charts for each particular country, language of instruction, attendance mode, and much more. We demonstrate how a free and open-source visualization API can provide a useful overview of biomedical course demographics. This information will enhance the free movement of students across Europe, enable courses to be developed based on more accurate "gap analysis" and provide "real time", comprehensive data to be investigated by policy makers.

Link

1. http://www.on-course.eu

A2.6

Applying competency profiling of user groups to develop a training programme in Computational Biomolecular Research

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Life Science research has become increasingly digital and has a direct influence on our daily life in areas such as health and medical applications, the development of new drugs, efficient drug delivery, biotechnology, environment, agriculture and food industry. It is one of the largest and fastest growing communities in need of high-end computing, leading to an increasing number of life science researchers who are not computing experts but who need to use complicated computationally intensive biomolecular modelling tools. BioExcel is a newly launched Centre of Excellence (CoE; funded by EC Horizon 2020) for Biomolecular Research aimed at supporting these academic and industrial researchers in the use of high-performance computing (HPC) and high-throughput computing (HTC). As part of the project we have identified a number of user groups, called Interest Groups; initially, the Interest Groups are tied to the project's pilot use cases but this will be expanded when the centre grows. To make sure that the biomedical research communities can fully profit from the training offered through the new centre of excellence we will be determining the training needs for each of the Interest Groups by drafting a competency profile. The competencies will be determined with the aid of the community and sent out for wide consultation. To enrich the competency profile we will, for each competence, define what an individual will need to know and what skills they need to have to exhibit competence in a specific area, as well as list what behaviours are suited and unsuited to an individual with that particular competency—so that individuals can assess their own competence in each area and select appropriate training. The competencies will be mapped against existing training and new training courses and material will be developed where gaps are revealed.

A2.7

C-COMEND competency profile for Translational Scientists

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http://www.intrinsicactivity.org/2016/4/S1/A2.7

C-COMEND is an Erasmus+-supported consortium [1] which aims to bring together stakeholders from different sectors and disciplines involved in translational research and medicine development. A competency profile [2] has been developed to describe the interdisciplinary skills and knowledge that are required in translational research and medicine development. The C-COMEND profile describes the skills and personal qualities in the following categories: Research, Interdisciplinary Knowledge, Scientific Rigor and Reproducibility, Innovation and Tools, Communication and Complementary skills. It thus complements competency profiles for specific professions contributing to the medicine development process such as regulatory affairs or industrial pharmacists. The profile was developed with input from a wide range of stakeholders and is now open to stakeholder consultation. The C-COMEND competency profile has also been used to develop the curriculum for a short course "Translational Research and Medicine Development targeted at PhD students and early Postdocs [3].

Links

1. http://www.eatris.eu/c-comend.html
2. http://bit.ly/28poR3x
3. http://bit.ly/1V8VNHW

A2.8

The Specialist in Medicines Development (SMD): a global certification programme by PharmaTrain Federation

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http://www.intrinsicactivity.org/2016/4/S1/A2.8

The Specialist in Medicines Development (SMD) is a competency-based, workplace-centred 4-year education and training certification programme in medicines development, comprising a knowledge base covering the PharmaTrain Syllabus for Medicines Development, delivered and assessed through modular curricula, and the acquisition and demonstration of competencies for medicines development across seven domains of the competency curriculum. Participants in this mentored programme acquire knowledge and competencies within a framework of assessment, appraisal and annual review of progress and achievement, and on completion, receive an SMD Certificate from the PharmaTrain Certification Board (PCB). The programme has been developed by IMI-PharmaTrain and PharmaTrain Federation, a European follow-up programme (and is endorsed and supported by imi-train. Currently, a European pilot has been started in Italy and in Japan and subsequently in Portugal and Begium in close cooperation with IFAPP. Further global rollouts are planned for Latin America and Asia.

A2.9

Competency-based approaches to developing highly effective teams: summary of the landscape and methodologies available

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Intrinsic Activity, 2016; **4**(Suppl. 1): A2.9
http://www.intrinsicactivity.org/2016/4/S1/A2.9

Over the past seven years the IMI education and training projects, working together to develop the LifeTrain framework.
I will discuss the approach that we are taking to designing an innovative programme of professional development for the managers [1] and the technical operators [2] of research infrastructures. Our approach is based on: (1) extensive consultation, through surveys, workshops and white papers, to gauge where the greatest skills gaps are; (2) capturing information on competence requirements into a structured framework that can be mapped to existing training and used to design new training to fill the gaps; (3) developing professional development programmes that are carefully tailored to the needs of busy individuals working in teams.
So far we have encountered tremendous will among research infrastructures to collaborate and learn from each other. In addition to summarizing what we have achieved so far, I will also explain how you and your core facilities can get involved.
Many others have used a similar process to develop competency profiles for other roles in the biomedical sciences, and a selection of these is being collected on the LifeTrain website [3]. Towards the end of my talk I will summarise some preliminary thoughts on how this information might be consolidated into a searchable database of competencies required by professionals in different roles, and mapped to appropriate training.

Links

1. http://www.ritrain.eu
2. www.corbel-project.eu
3. http://www.lifetrain.eu

Session 3:

Developing Cross-cutting Skills

A3.1

Preparing predocs and postdocs for career opportunities beyond academia

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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.1
http://www.intrinsicactivity.org/2016/4/S1/A3.1

Opportunities and choices for well-trained predocs and postdocs have never been as varied as they are today. While this wealth of opportunities is a great benefit it is still challenging for today's fellows to develop an overview of and take an informed decision about their career options. From a candidates' perspective the biggest obstacle to entering the non-academic job market is the perceived lack of tailor-made training to prepare them for the non-academic environment. Pre- and postdoctoral research is intense and demanding and as such rarely a period in life where additional formal studies are pursued with ease. Furthermore, as they reach the highest academic qualifications, fellows increasingly individualize meaning that training in cohorts in not necessarily the best option for them anymore. They are more likely to benefit from trainings that refine their skills and knowledge in relation to individual talents and professional preferences. A fellow's scientific training is defined by the competing requirements of the actual research versus the need to acquire a standard set of basic vocational skills and to additionally identify their future personal career profile. As such, institutional training programmes for pre- and postdoctoral researchers need to provide a sound mix of small, well defined mandatory training items and a broad choice of optional courses and workshops. Offering such a balanced curriculum in conjunction with a dedicated mentoring programme is likely to be most beneficial towards helping candidates to make suitable and informed career choices. The talk will discuss these concepts in light of the training curricula established for the EMBL pre- and postdoctoral communities.

A3.2

Fostering leadership skills in supervisors, managers and team leaders: the Wellcome Trust Diploma

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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.2
http://www.intrinsicactivity.org/2016/4/S1/A3.2

The International Funders' Award in Management Skills for Researchers has been created by the Wellcome Trust in partnership with the Open University and in collaboration with Institut Pasteur, Medical Research Council and the Bill and Melinda Gates Foundation. Aimed at post docs and early PIs the program will focus on the management skills needed to be a successful researcher. Primarily delivered through an online portal and supported by learning assistants, the program will be available for researchers throughout the world and should lead to higher productivity, savings on costs and improve success in grant applications.

A3.3

Lifelong learning for students

Raluca RADU[1] and David KOLOŠIĆ[2]
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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.3
http://www.intrinsicactivity.org/2016/4/S1/A3.3

The EPSA Lifelong Learning Programme is a tool developed to support students in pursuing their continuing learning process. At its core the project has a competency framework based on which students can evaluate themselves, be evaluated by an assessment committee and further directions of development can be given.
The EPSA Student Pharmacy Framework (SPF) is a competency framework that defines the behaviours that you should develop throughout your studies. It identifies four key areas (roles) which are important for student development. Under these roles 15 competencies are grouped, each described at three levels of development which, in turn, have several descriptors which define how the competency will be recognized.
The development of the framework was based on existing models which were adapted to students through a process of gathering inputs from them, as well as professionals working in different fields.
In order to complete the learning cycle report forms were created and need to be filled in for each competency the student applies for. This enables the student to reflect upon his learning process and identify key areas for further improvement. At the same time these reports are used by assessors in order to better understand and evaluate each participant in the project.

A3.4

Resilience: reacting to a failing career plan

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Developing a viable career plan is crucial to achieving your goals—if you don't know where you want to go, it's unlikely you'll ever get there. However, just like most large projects frequently face cost and time overruns—think of large public building projects—your working life is unlikely to run smoothly from start to finish. What can you do when the professorship seems out of reach after long years of painful toiling? What if you feel stuck in an industry position that turns out to be much duller than the fancy job title made you believe? What if you have to react to death or sickness in your family? Or—much happier but no less challenging—childbirth? There is nothing like a development plan for resilience to such professional shocks. However, we can learn from success and failure of others, so we'll look at some case studies and try to derive general principles from them. Why does person A seem to get stronger with every challenge, while person B only derives sadness and frustration from each "cost and time overrun" in his or her life? Was the plan too challenging or inflexible, was its execution sloppy or did the "perfectionist trap" snap, in which no result is ever satisfactory?

A3.5

PhD Competence Model

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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.5
http://www.intrinsicactivity.org/2016/4/S1/A3.5

Aim: In an increasingly competitive academic world, doctoral researchers need to be more conscious of the importance of developing competencies and transferable skills.
Problem: More competition and less funding equates to uncertain career paths. PhD candidates routinely acquire competencies and skills during the PhD track through on-the-job training and doctoral education. Selling their capabilities is crucial to convince potential employers of their added value to the labour market.
Result: The PhD Competence Model is a self-assessment tool to help PhD candidates more efficiently direct their time towards improving skills areas that are most needed for their own personal career development. It provides a clear understanding of how PhD candidates should develop as highly qualified research professionals. Seven competence areas are defined: at the centre Research Skills and Knowledge, surrounded by Responsible Conduct of Research, Personal Effectiveness, Professional Development, Leadership and Management, Communication, and Teaching. Each area comprises a number of specific competencies. PhD candidates judge themselves, in comparison with peers. Results are shown in a spider graph.
Conclusion: The PhD Competence Model is an easy-to-use self-assessment tool to increase awareness of needed and acquired competencies for PhD candidates, to improve career planning.

A3.6

on-course.eu: searching for European courses in biomedical research made easy

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http://www.intrinsicactivity.org/2016/4/S1/A3.6

on-course.eu [1] is the most comprehensive postgraduate biomedical course database in Europe. Launched in February 2012 it has grown rapidly. Currently the on-course.eu database contains more than 7,400 European courses from a wide range of disciplines relevant to biomedical research, including courses on transferable skills. Course seekers are offered free-text search with advanced search filters. A bookmarking function allows pooling courses in comparison lists. Registered users can set search preferences in their user profiles for repeated use. All data is implemented in a structure which prepares on-course.eu for automated feeds from course providers' databases. Course providers benefit from easy-to-use data entry and editing, a recently improved registration tool and a newly introduced automated e-mail reminder option. The Toolkit for Trainers resource provides trainers with advice on choosing teaching methodologies. A learning-style quiz is also included. The on-course.eu platform provides detailed background information to users including statistics, publications, live-data graphs, information about trends and gaps and other facts and figures relevant for biomedical education and training. In the back-end on-course.eu curators can run effective queries to monitor course information. on-course.eu's current usage statistics show steadily increasing user numbers. Future plans are aiming at linking courses to competency profiles. on-course.eu will soon include training courses for managers of research infrastructures. on-course.eu is also exploring options of supporting the European science4refugees initiative. on-course.eu was designed and built with input from a broad stakeholder group from industry and other employers, academics, students, policy makers and course providers. Continuing analyses of on-course.eu data regarding trends and gaps and surveys on demand areas formed the priorities within on-course.eu.

Link

1. http://www.on-course.eu

A3.7

A WIN-WIN "ECCRT & On-course"

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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.7
http://www.intrinsicactivity.org/2016/4/S1/A3.7

ECCRT's [1] journey with EMTRAIN began in 2014 when we put our first course on the on-course platform [2]. The reason was simple: we were dedicated to clinical research training by providing courses for continuous professional development and on-course provided us with the perfect platform to showcase our courses. The advantages for us as a private company were many; to begin with the service was completely free, we could reach a broader audience, have increased

visibility, build our network and showcase our courses on a prestigious and comprehensive platform as on-course. On the other hand, the logistics were seamlessly just too effortless—hosting of the course is user friendly, we are sent reminders to update courses when necessary and we get access to on-course forum, which helps us in turn to assess our own courses. On-course has a special team dedicated to finding Gaps in the Industry and we as a training-providing institute are here to bridge these gaps. Our quality standards are high and therefore we are able to provide this platform the quality content courses that it needs to maintain its standard.

Links

1. http://www.eccrt.com
2. http://www.on-course.eu

A3.8

A universal competence framework for scientists

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Intrinsic Activity, 2016; **4**(Suppl. 1): A3.8
http://www.intrinsicactivity.org/2016/4/S1/A3.8

The Science Council's professional registration scheme [1] promotes common standards of competence, professional development and ethical practice for scientists across disciplines and sectors. The standards of Registered Science Technician (RSciTech), Registered Scientist (RSci) and Chartered Scientist provide a framework that enables progression, mobility and continuous improvement.

The standards address five broad areas of competence applicable to all professional scientists: Application of Knowledge and Understanding, Personal Responsibility, Interpersonal Skills, Professional Standards and Professionalism.

To remain registered, scientists need to engage in appropriate continuing professional development and abide by a code of conduct. All registered scientists are affiliated to an appropriate professional body which supports their professional development and ethical conduct.

The Science Council works directly with employers to promote the importance of lifelong learning and the value of professional registration. Several employers have already become Science Council Employer Champions [2], demonstrating their organisational commitment to their scientific staff.

Links

1. http://sciencecouncil.org/scientists-science-technicians/benefits-of-professional-registration/what-is-professional-registration/
2. http://sciencecouncil.org/employers/

A3.9

Stay ahead in biomedical sciences—catch the LifeTrain

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http://www.intrinsicactivity.org/2016/4/S1/A3.9

The medicines research and development process is undergoing considerable change. Today, professionals are expected to be much more agile, moving and collaborating between disciplines, sectors and geographical locations. This necessitates continnually developing and maintaining competencies required to work most effectively.

LifeTrain [1] is a cross-sectoral platform for supporting continuing professional development (CPD) in the medical, biomedical and pharmaceutical fields. The initiative aims at promoting dialogue between employers, course providers and scientific communities, and at providing professionals with guidance for career planning and competence development. Funded by the Innovative Medicines Initiative (IMI) as part of the imi-train project [2]. LifeTrain registers a growing list of signatories who have agreed to its principles and to work towards their implementation.

Within the LifeTrain framework, an increasing number of stakeholders are focussing on the development and implementation of competency profiles and certification processes to recognise that bearers excel in their respective disciplines regarding standards of education, skills, experience and professional standing. In Parallel, individual professionals are advised to develop and maintain competency portfolios which are recognised by both professional/scientific bodies and employers.

Since its foundation in 2011 LifeTrain has run four workshops, conducted specific research and pursued broad networking efforts to engage stakeholder groups. Case studies and success stories have been documented for dissemination and motivation. In addition, efforts were taken to integrate the LifeTrain concepts in policy makers' and funders sstrategies.

Lifetrain strives to disseminate its agreed principles for broad implementation and recognition. Ultimately, the initiative's aim is to establish its principles as state-of-the-art within the sciences now addressed, and potentially beyond.

Links

1. http://www.lifetrain.eu
2. http://www.imi-train.eu

Session 4:

Transformative Learning: Applying Learning in the Workplace

A4.1

How can an adaptive training programme support change in organisational strategy?

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http://www.intrinsicactivity.org/2016/4/S1/A4.1

There have been growing needs of well-trained persons in pharmacovigilance and pharmacoepidemiology highlighted by industry, regulatory and academic bodies. Especially, there is a need of skilled persons, specifically trained in risk-benefit assessment, risk management plan elaboration, risk minimisation and risk communication as pharmacovigilance practices and post-licensing evaluation of medicines has evolved towards a more pro-active approach. This has led to the emergence of new job profiles such as project managers, pharmacoepidemiological coordinators, risk-benefit analysts and collaborators able to interfere with statisticians and clinicians. People within the pharmaceutical industry do not commonly take a master degree due to the involvement it requires for people having a full-time job and who already have a professional diploma (MD or Pharmacist). Nevertheless, as there is not any specific training or specialization required to do pharmacovigilance, there is a need to develop special short courses adapted to those professional specific needs such as

spontaneous reporting, databases, regulatory reporting etc. Therefore, Eu2P has achieved this goal by providing flexible and modular distance learning approach allowing for on-the-job training, with various proficiency levels and leading to awards jointly acknowledged by the Eu2P universities. Based on its Master curriculum, the Eu2P short-course programme is a training designed for professionals who want to get an up-to-date, quick, and solid knowledge. This adaptive and tailored short courses curriculum has allowed to build 34 different professional profiles for big pharmaceutical companies. It is foreseen that the training of more than one hundred collaborators leads to positive changes within the organisational strategy of the pharmaceutical companies. The expected impact lies in terms of increased efficiency as regards quality, results and communication among the various company departments.

A4.2

The GRL Pipeline: an experiental learning architecture to accelerate the development of global leaders

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Intrinsic Activity, 2016; **4**(Suppl. 1): A4.2
http://www.intrinsicactivity.org/2016/4/S1/A4.2

The Life Sciences Industry is dealing with increasing economic pressure, faster to market requirements and more complex execution due to *e.g.* the importance of emerging markets. The complex drug development process is managed by large global teams who collaborate effectively to allow timely access to markets and patients. To successfully lead these global virtual teams, it is essential to have the right people with the right skills, available to take on a new project at the right time. However, in many companies it is still common today to promote the best scientist to leadership roles based on their technical achievements. With “The GRL Pipeline” Program, we established a new way of accelerating our regional leaders development into Global Leadership roles. The focus of the program is on non-technical skills and behaviors, in particular on leadership and interpersonal skills; the approach is based on scientific rigor and on experiential learning. After 3 years of experience with the program, we consider it one of the key success factors for the leadership pipeline we were able to establish. The session will share the story behind the program, and it will provide you with the rational (why invest in leadership development in our industry?), the how (what were key ingredients for the program?) and what we learnt so far (what made it successful?).

A4.3

An outsider looking in… Opportunities for transforming Learning in the Pharma industry

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Intrinsic Activity, 2016; **4**(Suppl. 1): A4.3
http://www.intrinsicactivity.org/2016/4/S1/A4.3

Every industry feels their challenges are unique, but when you look below the surface there are many themes that run across. With over 15 years experience of working with global companies in the field of Learning and Learning Transformation, Simon shares his recent observations on Learning in the Pharma industry. What can Pharma learn from other industries, and what are the opportunities Pharma has for transforming it’s approach to Learning. This short session will cover many aspects of the Learning world, from creating role-based curricula to moving learning virtual, to the opportunities of user-generated content and iPhone video…

A4.4

Tailored workplace-based learning for successful regulatory professionals

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http://www.intrinsicactivity.org/2016/4/S1/A4.4

Entry into Regulatory Affairs is challenging. Employers seek candidates with scientific training and regulatory experience to fill vacant positions, whilst excellent candidates cannot gain the experience required. As global demand increases, new approaches to attracting and developing talent are needed, including promoting this career to undergraduates, recruiting new graduates, recruiting from other disciplines and providing all with the appropriate structured development programmes.
TRAC, The Regulatory Affairs Consultancy, has successfully trained more than twenty new graduates over a 10-year period, addressing a skills shortage due to geographical factors. Their process for the recruitment of candidates, and their training and development through interactive learning, on the job experience, and a system of internal company "buddies" or mentors will be discussed, as well as the potential for this to fold into an industry-recognised appreciceship programme. The role of the professional body, TOPRA (The Organisation for Professionals in Regulatory Affairs) in supporting members with formal training, peer-to-peer networks, a defined competency framework and a set of standards for professional behaviour will be explored. The importance of independent CPD recording through the professional body will be discussed in the context of how educational qualifications, membership status and professional qualifications can be aligned.

A4.5

How to see a ghost, think like a molecule, and write like a scientist

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http://www.intrinsicactivity.org/2016/4/S1/A4.5

A new model of the relationship between science and communication: Most scientists see communication pragmatically: as a tool to transmit information to their peers and other audiences, and thus a set of skills to be learned. But communication and research are connected at a more profound level: distilling ideas into texts, images, mathematics or another representational system is an essential step in structuring thinking. The connection lies in the complex models that give everything in science its meaning. Models are complex cognitive architectures that individual scientists build in their minds and constantly revise through learning and experience. As they do so, they integrate concepts about specific systems into larger theories such as evolution, the fundamental principles of science, and basic cognitive patterns that we use in our daily lives. This process is crucial to success, but it is poorly understood and rarely discussed in any systematic way during a scientist's education. Communicative situations expose the structure and invisible architecture of a model by making the connections between ideas explicit, so that scientists can check their logical consistency, discover hidden assumptions and patterns, apply new ones and generate new scientific questions. These are usually important steps along the way to new discoveries. This makes the process of communication fundamental to the lifelong process of learning that is necessary for a successful career in science. In this presentation I will show how communicative tools can

be applied to the "mental game" of science to help scientists improve both their writing and their research.

A4.6

New roles of research libraries in lifelong education and training: Coffee Lectures, Menu Cards and PhD Courses

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The foundations for lifelong learning cannot be laid early enough. Bachelor students must already be aware that in the digital age and in a knowledge-driven environment lifelong learning is a prerequisite for continuing success. The subject-specific education needs to be complemented with the training of skills that allow researchers to stay-up-to date, *i.e.* information retrieval and knowledge management skills. We believe that research libraries will have to play an important role in teaching these skill sets, complementing the teaching activities of the faculty members. Thus, libraries need to develop an education and training concept that starts with first-year students and continues with PhD students up to senior researchers. At ETH Zurich, we have established such a program for chemistry and life sciences, including three new formats that we successfully utilize in our education and teaching activities. Coffee Lectures, 10-min presentations with tips and tricks on databases and tools, were introduced in 2013. Numerous university libraries in Germany and Switzerland have meanwhile adapted this format. In 2014 we developed another format, a 1 ECTS PhD course. This course is unique as it reflects the research cycle, mapping the use of information and knowledge management and analyses tools to the various steps of the research process. The latest format, introduced in 2015, is Research Group Menus. They are given on request to research groups, which can select from an annually updated menu card, with starters, main courses, specials and desserts corresponding to various information solutions. With these activities we actively contribute to the continuing education of professors, researchers and students ensuring that well-educated students and researchers make their way into academia and industry.

A4.7

Putting the "Development" in Human Resource Development: a pilot experiment with faculty development and "sustainable learning"

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Human resource development (HRD) "is about lifelong learning". However, "lifelong learning" can sometimes be defined as simply maintaining competency with respect to the "state of the science" or "keeping up to date"—*i.e.* continuing to learn new things relevant to the profession. Such "lifelong learning" is typically represented or achieved by attending workshops, reading materials and/or answering multiple-choice questions on this content, or completing other, similarly generic, work throughout a career. While continuously mastering new information associated with a target topic may in fact represent "lifelong learning"—it does not necessarily represent "development", *e.g.* of greater sophistication in thinking about that material. In this sense, lifelong learning is not the same as "continued professional development". "Sustainable learning" has been defined as learning that continues after teaching ends and extends beyond the course content; this implicitly involves "transfer", known to be important for learning, but difficult to achieve. A focus on "sustainable" learning could be an empirically supportable approach to HRD that can change "lifelong learning" into "continued professional development". This paper describes the application of ongoing empirical research into sustainable learning during professional development (in PhD students preparing for research careers) to the current challenge in Human Resource, faculty, and workforce development where new material continues to be published/created with increasing frequency. The framework involves a focus on metacognition around the target knowledge to engage the learner explicitly in not just learning the material, but in seeking to deepen their sophistication in transferring that learning across their work context.

A4.8

Continuous education for core facility scientists: the German BioImaging Educational Program

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German BioImaging is a national network of imaging core facilities and microscopy research groups. Its mission is to facilitate communication and promote coordinated activities of German scientists involved in developing, applying and providing imaging technologies for life science research. One major goal of German BioImaging is the promotion of the continuing education of scientists working in advanced light microscopy core facilities. To this end, German BioImaging has developed an educational program tailored to the needs of core facility staff and leaders. The program has three pillars: the initiatives Job Shadowing and One place for GerBI, and the German BioImaging Core Facilities Management Course. In our contribution we will describe the aims of these three initiatives and report about the experiences made since their first implementation in 2014.

Workshops

A5.1

Developing and using competency profiles for professional development

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Objective and target audience: Competency-based learning is gaining momentum in both academia and industry, and can be used by employers, professional bodies, course providers and individual professionals to plan professional development, undertake learning (either through courses or by other, informal means) and document it. The objective of this interactive workshop is to provide guidance on how to use competency profiles to enhance professional learning, and on how to build a competency profile appropriate for this purpose.

The workshop is aimed at learning professionals from academia, industry, regulatory agencies and professional bodies. We will use examples of competency profiles developed by the IMI Education and Training projects to illustrate the process of developing a competency profile, mapping it to and developing training programmes to meet competency requirements. We will build in activities to allow participants to practice some steps of this process.

Expected outcomes: Participants will leave the workshop with an understanding of how competency profiles can help them to create appropriate programmes of learning for their staff (employers), members (professional bodies) or audiences (course providers). They will have been provided with a process and a set of tools that they can use to adapt existing competency profiles or develop their own.

A5.2

Supporting early-stage researchers to plan their careers

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Objective and target audience: The objective of this workshop is to provide a systematic approach to career planning for those whose role it is to supervise, mentor or otherwise develop early-stage researchers including (but not limited to) PhD students and post-doctoral fellows. The workshop is aimed at anyone in academia or industry with supervisory or pastoral responsibility for early-stage researchers, including principal investigators, HR managers, deans of graduate studies, course providers and mid-career scientists with supervisory responsibilities.

Active career planning seldom features in the lives of early-stage researchers: 50% of postdoctoral researchers have no idea how their postdoctoral training will lead them into a career [1]. Yet there is evidence that developing specific career goals makes early-stage researchers more likely to succeed, leading to higher salaries, more frequent promotions, more responsibility and greater job satisfaction. This approach encourages researchers to take an active role in their career progression and is beneficial for those intending to pursue academic or non-academic careers.

There are some excellent resources readily available to help early-stage researchers to recognise their personal strengths and enthuseasms, plan their careers and then adhere to a plan. We will introduce these in a highly interactive way.

Reference

1. Gibbs KD Jr, Griffin KA: **What do I want to be with my PhD? The roles of personal values and structural dynamics in shaping the career interests of recent biomedical science PhD graduates.** *CBE Life Sci Educ,* 2013; 12(4):711–723. doi:10.1187/cbe.13-02-0021

A5.3

Training impact and quality—presenting the Elixir recipe

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Workshop objective: The aim of this workshop is to present the Elixir "recipe" for the provision of quality and impactful training, and seek the input of the wider biomedical sciences community, including those who are supporting and developing training as well as those who wish to access it. We hope to engage more individuals from both academic and industrial backgrounds, and those who are further along their career path than we have been able to thus far. The ultimate aim is to apply these best practices to a European training programme, enabling the capture of meaningful indicators of training impact. With these indicators we aim to capture both qualitative and quantitative measures of skills acquisition amongst those who receive the training (and the wider benefits to the community) plus the efforts involved in delivering such a programme, providing important feedback to policymakers and funders.

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