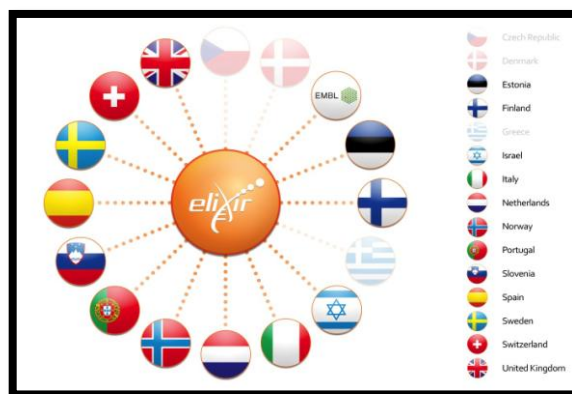


5 ELIXIR Training Programme

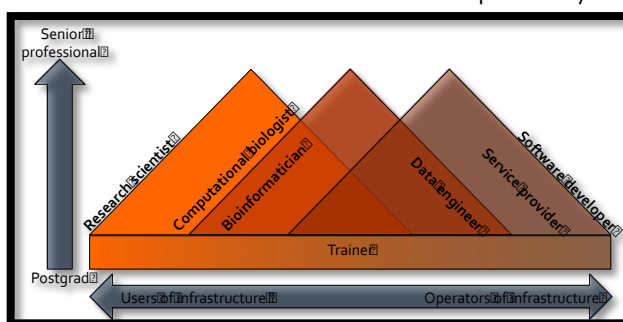
Remit. Whilst ELIXIR's broad aim is to facilitate *access* to biological data for Europe's life science community, the goal of ELIXIR's training strategy is to facilitate *accessibility*, by upskilling European researchers who then more effectively exploit the data, tools, standards and compute infrastructure provided by ELIXIR. ELIXIR's training strategy is tightly focused on actively supporting and training these users electronically or through face-to-face courses and programmes held throughout Europe. Although there is much ongoing activity in this area, these efforts lack a pan-European coherency. The ELIXIR Programme Work stream will, in partnership with global efforts such as GOBLET: (i) deliver a ELIXIR-wide training plan coordinating training capabilities that builds on existing Node expertise, (ii) optimise training methods across Nodes, (iii) identify and fill-in gaps in skills that are, or will soon be, required by industry and academia, and (iv) measure improvements in skills training.

ELIXIR's preparatory phase recommendations focused on: (1) creating a mechanism by which the development of data resources is tightly linked to the provision of training materials; and (2) creating a centralised Training Support Unit to (a) build and maintain a registry of information relating to bioinformatics user training; (b) develop benchmarking and evaluation systems; (c) coordinate support and developmental opportunities for trainers; (d) enable the development of new training programmes and their integration with existing initiatives; and (e) act as a central point for interaction with other pan-European training infrastructures.

More recently, the FP7-funded I3 project SLING led to the development of an online training community that was extended to form **GOBLET**, the Global Organisation for Bioinformatics Learning, Education and Training. Also, ELIXIR joined **EMTRAIN**, a pan-European platform supporting training in the biomedical sciences. This has enabled ELIXIR to work with the other BMS RIs, industry, professional bodies and other course providers in the biomedical sciences to build a catalogue of courses, quality standards, and an emerging framework for continuing professional development (**LifeTrain**). The proposals drafted by prospective **ELIXIR nodes** defined the subset of nodes that plans to contribute to ELIXIR's training strategy (see Figure). One proposal (UK's) focused exclusively on training and has secured funding to deliver on some of the activities outlined in the preparatory phase recommendations.



The **major challenges** for the ELIXIR training programme are to identify pan-European training needs and priorities, to define core competencies for different scientific roles, and to collate the evidence required to successfully increase the currently low-level of funds won for training purposes. The ELIXIR training programme will focus on adequate provision of training to a large and diversifying user base, and the development of a new generation of software engineers, biocurators and other professionals needed to operate ELIXIR. Each of these will need to be underpinned by a European community of trainers who excel in their subject-matter expertise and in their grasp of adult learning and who share a common approach to monitoring and capturing the success and impact of the training (see Figure, right). The acute need for training personnel must be recognised and resourced by the individual nodes, with appropriate funding for the hub to perform and respond to training needs, support the professional development of trainers, and analyse training provision against agreed benchmarks.





ELIXIR will need to forge **international alliances**, in order to harmonise efforts, to share resources, to avoid duplication/redundancy and to maximise effectiveness. Specific organisations and initiatives with which to collaborate may be (but are not limited to) GOBLET, the Australian Bioinformatics Network, the Asia-Pacific Bioinformatics Network, the Iberoamerican Society for Bioinformatics (SolBio), the African Society for Bioinformatics and Computational Biology, the organisation responsible for delivering the Canadian Bioinformatics Workshops bioinformatics.ca, the pan-African bioinformatics network, the International Medical Informatics Association, the International Society for Biocuration, the International Society for Computational Biology, the Metabolomics Society, the Genetics Society, BioSharing (working to address training in data curation and standardization), Rosalind (an online platform for learning bioinformatics through problem solving), and Software Carpentry (a volunteer organisation whose members teach basic software skills and best practice in programming to researchers in science, engineering and medicine). Close engagement with industry will be required, perhaps via over-arching organisations such as the Pistoia Alliance, EFPIA, CASyM, IMIs, and through close interaction with the other ESFRI-BMS RIs, perhaps via LifeTrain and/or BioMedBridges.

Nine ELIXIR Training objectives 2014-2018 (M1-M6o)

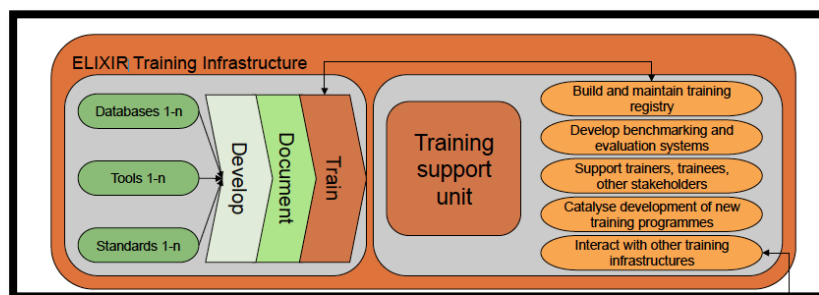
1. Establish a common approach to benchmark and evaluate diverse training activities M12;
2. Establish an ELIXIR-wide training community M12;
3. Disseminate information via a training portal M24;
4. Identify training gaps and priorities M24;
5. Develop and deliver new training activities to fill gaps and meet priorities M36;
6. Synchronise the development of ELIXIR data infrastructures with associated training materials M36;
7. Define core competencies of users and operators of ELIXIR infrastructure M48;
8. Capture and deliver ELIXIR training activities in open-access web content M6o; and,
9. Deliver ELIXIR training activities through 'crowd-training' M6o.

Achievement of these objectives will enrich **ELIXIR infrastructure** by widening its industrial and academic user base and deepening their ability to fully exploit it. Infrastructure delivered by ELIXIR will fall short of its full potential unless occasional, regular and power users from research science and technology are trained. Individuals trained in ELIXIR infrastructures will not just gain new skills in niche activities but should gain skills that span between classic disciplines and that catalyse new science. Ultimately a cohort of such trained individuals would themselves become trainers making the scalability and sustainability of these efforts long lasting. ELIXIR training, if delivered well, should empower European science for this and future generations.

Relevant Node Services

Nine ELIXIR Nodes offer training courses (both on their current and future node resources) and the majority of nodes are committed to share both their materials and their expertise. Other services offered are, for example, e-learning

opportunities (3 nodes), development of training benchmarking and evaluation systems (4 nodes), outreach (5 nodes), train-the-trainer opportunities (3 nodes) and a training portal (1 node). Nodes will also train on sources of data and noise, and issues regarding data reliability and consistency. This depth of experience matches the expertise required to deliver the Training Objectives 2014-2018.



Resources

To be defined.