

ELIXIR

Susanna Repo, ELIXIR Finland & CSC

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elixir-europe.org

What is a research infrastructure?

Can you name any?

European Strategy Forum on Research Infrastructures (ESFRI)

- EU's strategic advisory body for research infrastructure, helping member states and the Commission decide where to invest in large-scale scientific facilities
- What it does?
  - Identifies strategic research infrastructure needs
  - Coordinates national & EU investment
  - Advises the European Commission
  - Promotes open access to facilities

40 European countries

Key output: ESFRI roadmap, every five years

Thematic areas
Health & Food
Social sciences
Physical sciences
Energy
Environment
e-Infrastructures

AnaEE	Analysis and Experimentation on Ecosystems
BBMRI ERIC	Biobanking and BioMolecular Resources Research Infrastructure
EATRIS ERIC	European Advanced Translational Research Infrastructure in Medicine
ECRIN ERIC	European Clinical Research Infrastructure Network
ELIXIR	A distributed infrastructure for life-science data
EMBRC ERIC	European Marine Biological Resource Centre
ERINHA	European Research Infrastructure on Highly Pathogenic Agents
EU-OPENSCREEN ERIC	European Infrastructure of Open Screening Platforms for Chemical Biology
Euro-BioImaging ERIC	European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences
INFRAFRONTIER	European Research Infrastructure for the generation, phenotyping, archiving and distribution of mouse disease models
INSTRUCT ERIC	Integrated Structural Biology Infrastructure
MIRRI	Microbial Resource Research Infrastructure

Latest roadmap: ESFRI Roadmap 2021 — 22 projects, 41 landmarks
https://roadmap2021.esfri.eu/media/1250/rm21-part-1.pdf

What are research and innovation infrastructures?



Infrastructures are not only large physical structures, such as buildings and transport networks, but also services and collections of resources



Research infrastructures are the facilities, resources and services that enable research and innovation



Research infrastructures take a long time to plan and build and most need to have long operational lifespans

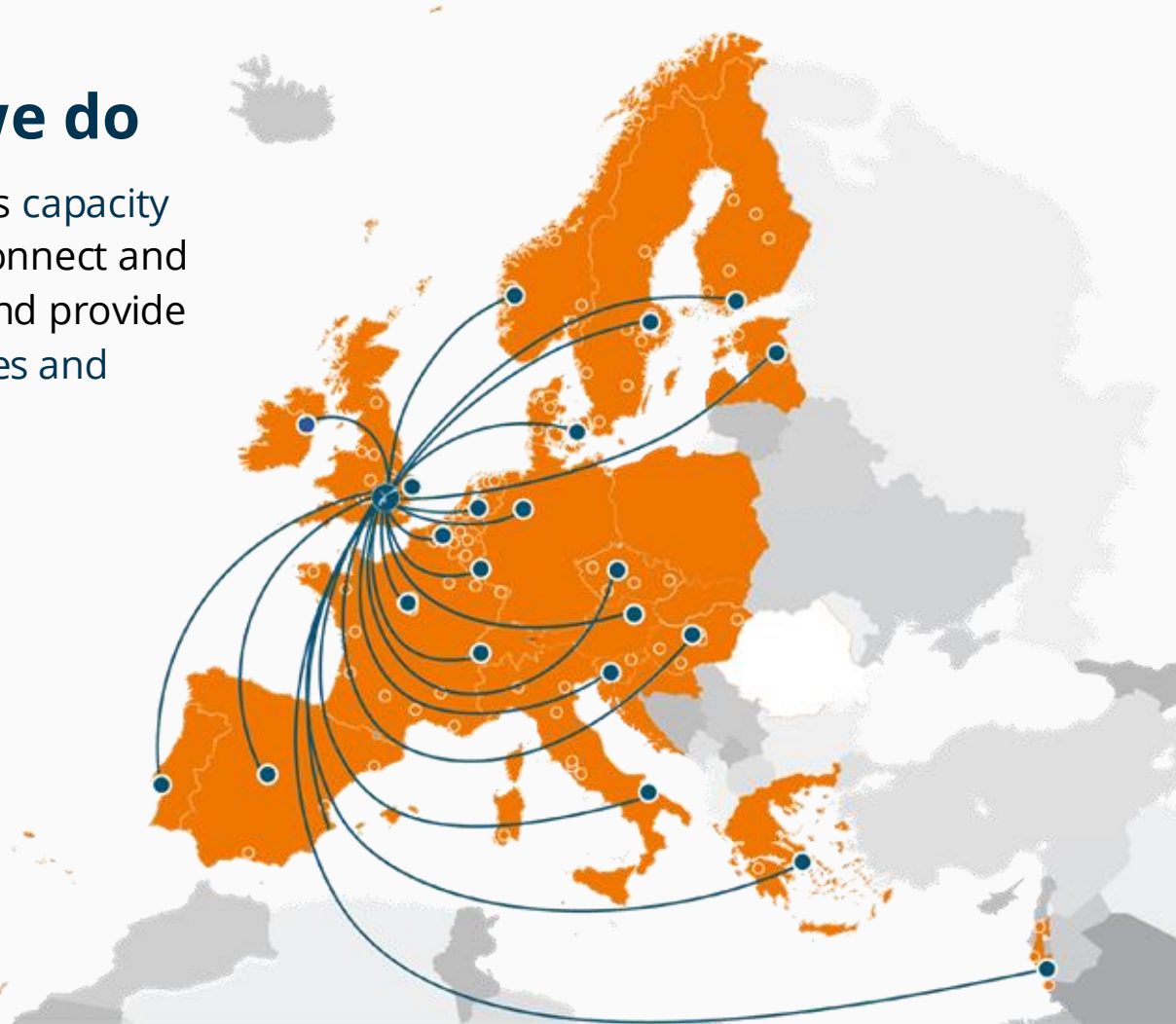


Supporting research and innovation infrastructures **enables the next generation of researchers and innovators**

ELIXIR – what do we do

We build life science informatics capacity and infrastructure in Europe, connect and develop a network of experts and provide hundreds of high quality services and resources available to all

- Databases
- Training
- Software tools
- FAIR resources
- Compute resources
- Scientific & technical experts



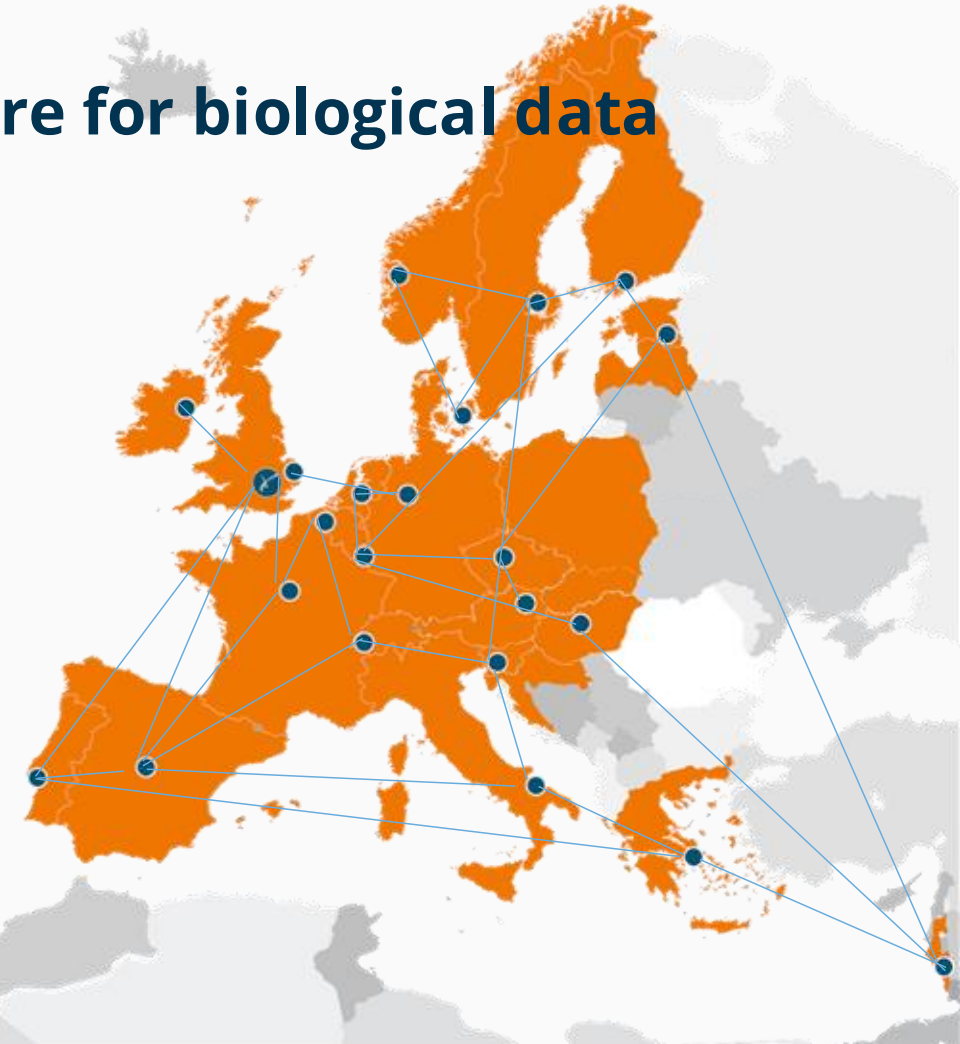
A sustainable infrastructure for biological data

Members

Belgium
Czech Republic
Denmark
EMBL
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Israel
Luxembourg
Netherlands
Norway
Portugal
Slovakia
Slovenia
Spain
Sweden
Switzerland
United Kingdom

Observers

Austria
Croatia
Latvia
Poland



Data management challenges in life sciences

Data growth

Data diversity

Data location

Data sensitivity



76%

of respondents state that without data shared on open repositories, they would not be able to offer their project or service

https://f1000research.com/documents/10-828
Small and medium-sized enterprises

Why is ELIXIR needed

Managing and sustaining the important biological data, software and digital objects generated across Europe is highly complex, and not a task for a single country or institution

Long-term transnational coordination is required to align funding submissions to ensure the longevity of bioinformatics resources

ELIXIR provides the coordination to connect national life sciences data infrastructures into a single infrastructure that supports data and knowledge exchange and collaborations

National data infrastructures, brought together through ELIXIR Nodes, run hundreds of services and resources available free of charge to the worldwide life science community






ELIXIR services and resources – what we offer



What we offer



Guidelines

Guidelines and best practices to help you manage life science data, run training courses, develop software and more.



Web portals

Find the right software, training courses, standards and more in our interlinked portals to life science resources.



Services

Find compute services, databases, and the full list of resources ELIXIR coordinates.



Partnerships with Industry and SMEs

Join events and projects that bring the private and public sectors together.



Opportunities to work together

Join a scientific group in ELIXIR or partner with us to apply for EC funding.

For ELIXIR members

If you work at an institute that is part of ELIXIR, then remember to take advantage of the benefits ELIXIR offers.

ELIXIR coordinates the provision of life science services and resources, developed and managed by ELIXIR Nodes

The services and resources are freely available to researchers around the world

The services and resources support efficient manipulation, analysis, storage and exchange of life science data

https://elixir-europe.org/what-we-offer

ELIXIR's key service collections

Trustworthy services and resources passing stringent inclusion criteria

elixir Core Data Resource	31	**Core Data Resources (CDRs)**	Data resources of fundamental importance for the long-term preservation of life science data
elixir Deposition Database	14	**ELIXIR Deposition Databases (EDDs)**	Recommended resources for the deposition of experimental data
elixir Recommended Interoperability Resources	20	**Recommended Interoperability Resources (RIRs)**	Tools and resources to support FAIR research

elixir

Resources to access knowledge and curated digital objects

bio.tools

bio.tools helps you find and select bionformatics software and connect it in workflows.

BioContainers

Search a repository of containerised software that you can build into workflows.

WorkflowHub

A registry for sharing and publishing scientific computational workflows.

FAIRsharing.org

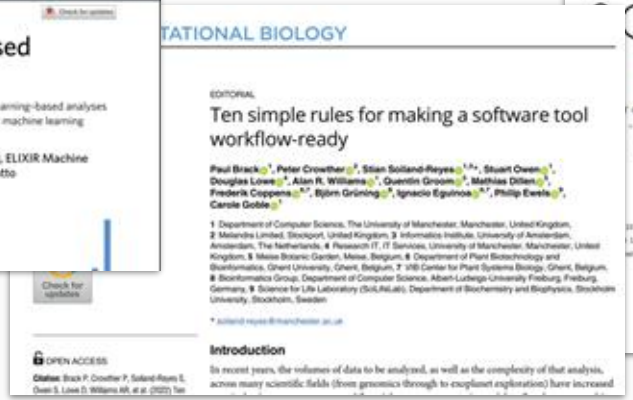
FAIRsharing.org allows you to search for databases and data policies by aspects such as domain, species and country.

TeSS

Search for training courses, webinars, training materials and workflows in TeSS, ELIXIR's training portal.


COMMENT | FOCUS

DOME: recommendations for supervised machine learning validation in biology


TATIONAL BIOLOGY

EDITORIAL

Ten simple rules for making a software tool workflow-ready


SCIENTIFIC DATA

OPEN

Comment: The FAIR Guiding Principles for scientific data management and stewardship

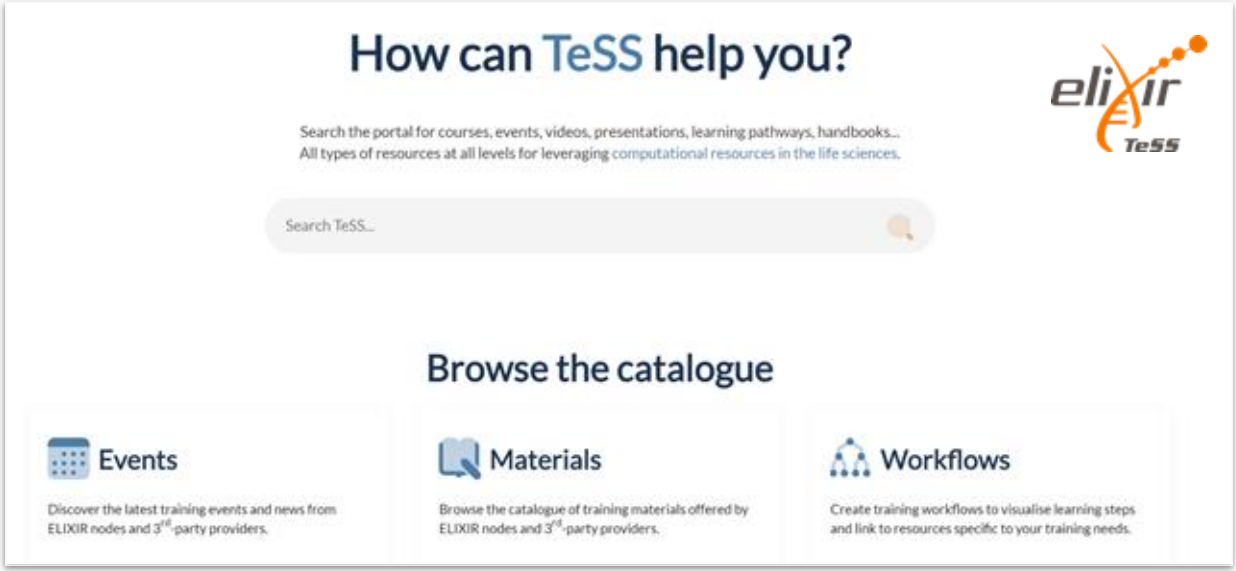
ELIXIR's Training Portal – TeSS (Training eSupport System)

Single entry point for trainers and trainees to discover online information and content

Lists **>1980 training materials** and **>165 events,** plus collections and learning paths

Training material collected from **67 content providers**

Event information collected from **73 content providers**



Niall Beard, Finn Bacall, Aleksandra Nenadic, Milo Thurston, Carole A Goble, Susanna-Assunta Sansone, Teresa K Attwood **TeSS: a platform for discovering life-science training opportunities**, *Bioinformatics*, Volume 36, Issue 10, 15 May 2020, Pp 3290-3291
https://doi.org/10.1093/bioinformatics/btaa047

ELIXIR research data management resources

Guidance for data stewards, project managers and researchers

Overview of good data management practices

RDMkit

The Research Data Management Kit (RDMkit) guides you through the whole data management life cycle and includes advice specific to your domain, your role and your country.

Step-by-step instructions

FAIR cookbook

The FAIR Cookbook contains step-by-step recipes to accomplish specific data management tasks and to make your data FAIR (Findable, Accessible, Interoperable, Reusable).

Data management plan wizard

DSW

The Data Stewardship Wizard (DSW) is an online tool that guides researchers and data stewards through their data management planning.

ELIXIR's support for FAIR data and software



FAIR data services & resources

Open registries, ontologies, identifiers, data management platforms, stewardship tools, data FAIRification methodology, standards



Trusted data resources

Open deposition databases and portals, scalable curation, sustainability



Data analytics & platforms

Workflows, reproducible and portable processing, software and AI best practice, FAIR assessment, federated analytics



Open & FAIR policy/advocacy

FAIR principles, FAIR leadership & partnering at the global, European and national level



Specific communities

Human Data, Structural Bioinformatics, Rare Diseases, Plant Sciences, Microbial Biotechnology, Proteomics, Metagenomics, Systems Biology…



Stewardship and training

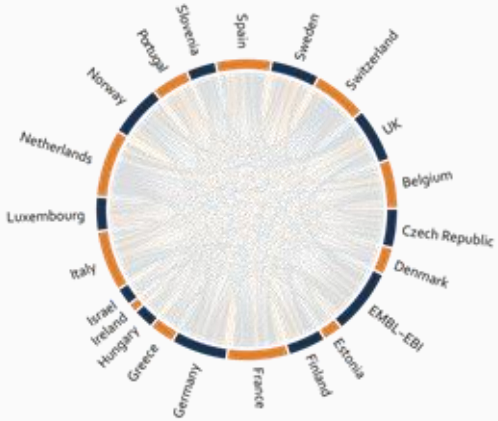
Capability frameworks, skills, data managers network, training portal

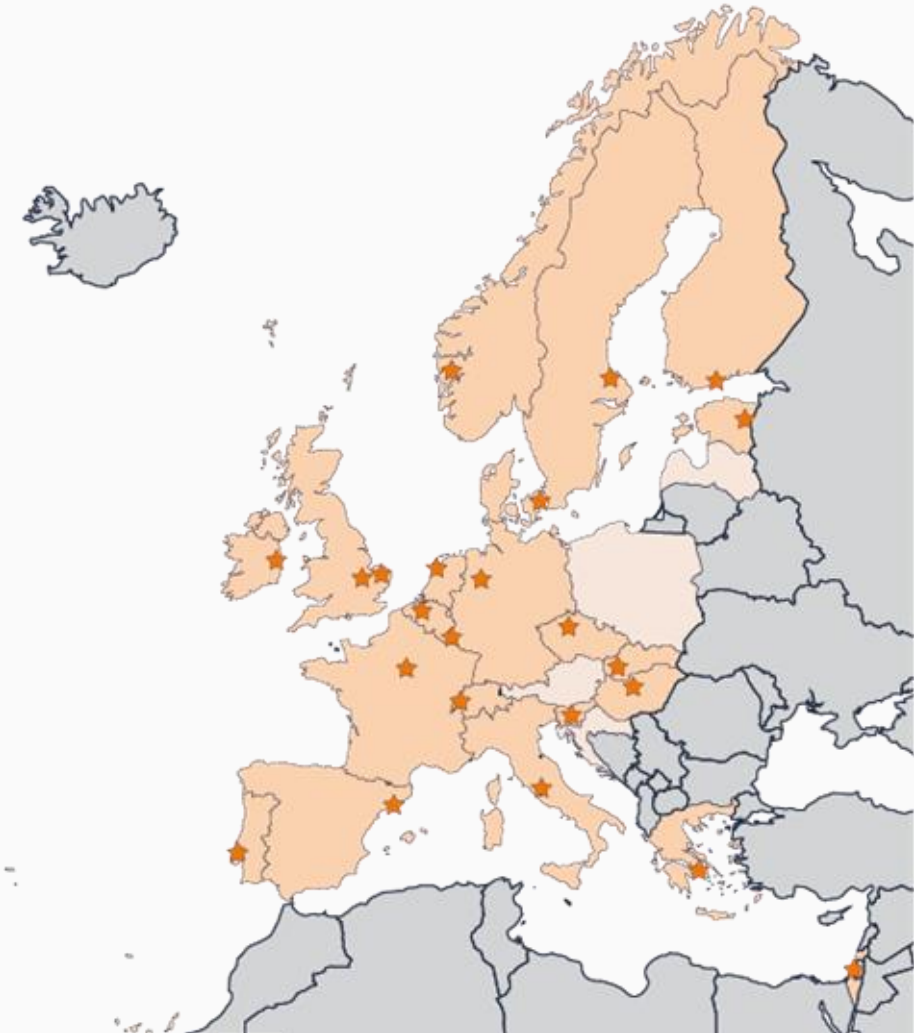
ELIXIR operations



ELIXIR Nodes

- **ELIXIR's 22 Nodes** are the national infrastructures in each of ELIXIR's member countries
- Nodes bring together **centres of excellence** in bioinformatics within a member country
- Nodes **run the services** within ELIXIR
- **Nodes are connected** in many ways, for example through Communities, Platforms and internal ELIXIR projects



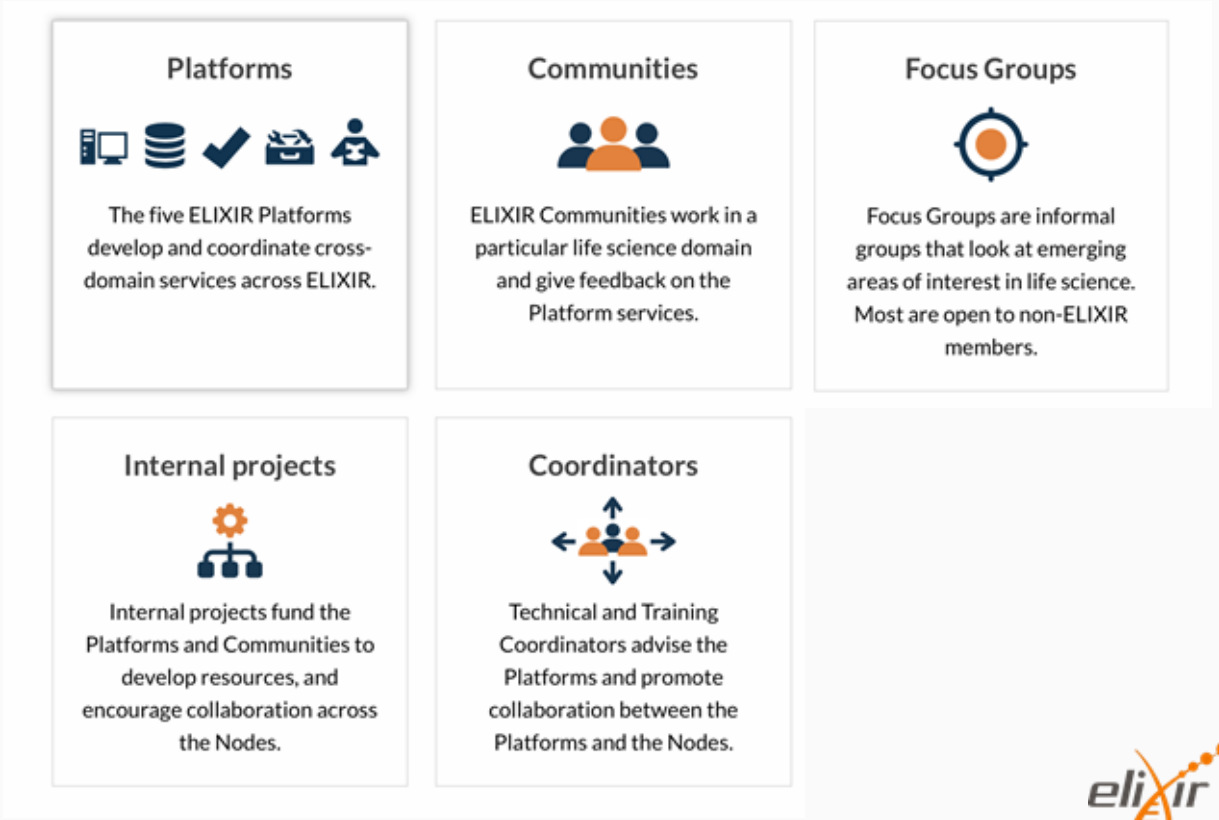


How we work

ELIXIR brings together **groups of experts** from different **technological areas**, **scientific domains** and **ELIXIR Nodes**

Cutting edge **internal projects** are funded to further encourage collaborations

Technical and training coordinators based in the Nodes support different groups of experts to work together



https://elixir-europe.org/how-we-work

ELIXIR Communities
– connecting infrastructure & life science experts

Formed around domain experts in ELIXIR Nodes (including non-ELIXIR partners)

Provide a mechanism for long-term collaborations with other ESFRIs and large-scale initiatives

Drive service developments in the ELIXIR Platforms

Provide a framework to develop and maintain community standards



The ELIXIR Communities Handbook tells you what a Community is, who can join, what the benefits are, and how Communities are structured.



ELIXIR expert groups - networking effect

ELIXIR brings groups of people together as **Communities, Focus Groups and Platforms**. There are **over 30 individual group**s which interact in a range of different ways.

3D-BioInfo	Metabolomics	Systems Biology	Domestic Animals Genome & Phenome	Pathogen Data	Data Platform
Food and Nutrition	Microbial Biotechnology	Toxicology	Biodiversity	Research Data Management (RDM)	Tools Platform
Galaxy	Plant Sciences	Federated Human Data	Cancer Data	Environmental Impact	Interoperability Platform
Intrinsically Disordered Proteins	Proteomics	Human Copy Number Variation	EOSC	AI Ecosystem	Compute Platform
Microbiome	Single-Cell Omics	Rare Diseases	RNA Data	Learning Paths	Training Platform