ARISE

Career Accelerator for Research Infrastructure Scientists

GUIDE FOR APPLICANTS

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AC: Advisory Committee
Div. & Eq. Committee: Diversity and Equality Committee
EB: Evaluation Board
EC: European Commission
EMBL: European Molecular Biology Laboratory
ExC: Executive Committee
GTLs: Group and Team Leaders
MGMT: Management
PCDP: Personal Career Development Plan
PD: Programme Director
PM: Programme Manager
RIs: Reaserch Infrastructures
STEM: Science, Technology, Engineering, Mathematics
StratComm: Strategy & Communication

WHAT IS ARISE?

ARISE is the fellowships programme that will train and develop Europe's next generation of senior scientists and leaders for research infrastructures in the life sciences.
The overarching research theme of ARISE is **technology development in life sciences, with emphasis on provision of the technology as a service to other researchers**.

What are research infrastructures and which skills leaders and senior staff of RI need?

Research infrastructures are core facilities, large instrumentation, data resources and other related services that are used by the broad scientific community to conduct research. They are the places that provide access to the latest techniques and expertise to use these techniques.

Classic examples of research infrastructures are core facilities located at research institutes (e.g. EMBL core facilities), which host advanced instruments and provide access to both internal and external researchers; major scientific facilities (e.g. synchrotrons) that exist in only small numbers around the world; data infrastructures promoting data sharing and use (e.g. collections, archives of scientific data, computing systems, and communication networks), and large pan-European research infrastructures that bring together services provided by smaller research infrastructures distributed across Europe (e.g. ESFRI research infrastructures like Euro-BioImaging, ELIXIR, Instruct, or EMBRC).

Maintaining and improving these infrastructures requires interdisciplinary skills – spanning science, engineering, service provision and management – that are not usually provided by traditional training programmes in academia or industry.

"During the last years we noticed an increasing need to train more engineers, physicists and other technology experts to become research infrastructure scientists," says Rainer Pepperkok, Director of Scientific Core Facilities and Scientific Services. "Yet worldwide, to our best knowledge, there was no training programme to address it, with few specialists being trained at the interface of academia and industry."

To address this problem, EMBL and Marie Skłodowska-Curie Programme established a unique new training programme for future research infrastructure scientists – ARISE – Career Accelerator for Research Infrastructure Scientists.

We are offering **62 Fellowships** to experienced technology and method developers
- *to join EMBL for three years to work on technology development and service provision, and*
- *get trained to become highly skilled Research Infrastructure Scientists*

Following ARISE, our Fellows will be competent to take leading positions in service providing infrastructures across industry, healthcare, academia, and other sectors.
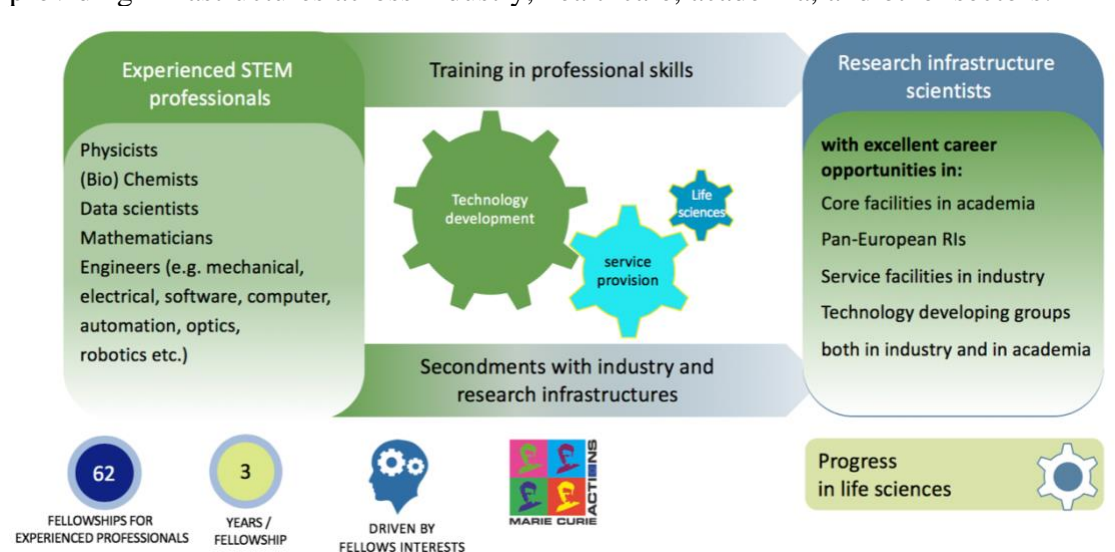
Figure 1 – ARISE in a nutshell

ABOUT EMBL

The European Molecular Biology Laboratory (EMBL) is an intergovernmental research organisation and centre of excellence for life sciences in Europe. EMBL's 1800+ staff members originate from over 80 countries; 43% are active researchers. EMBL's 6 sites located in 5 countries focus on molecular, cellular, computational, developmental and structural biology (Heidelberg), structural biology (Grenoble, Hamburg), epigenetics and

neurobiology (Rome), tissue biology and disease modelling (Barcelona), and bioinformatics (Cambridge). Research at EMBL is supported by excellent core facilities, bioinformatics and structural biology services, training for scientists at all career stages and the EMBL course and conference programme.

Figure 2 – EMBL sites
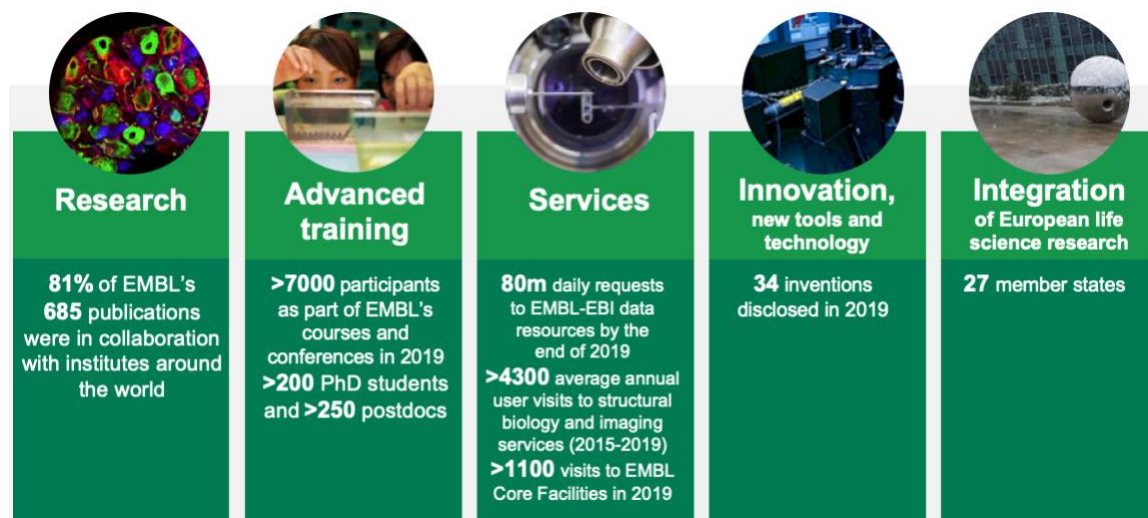
Figure 3 – EMBL´s mission

Technology development, particularly with the purpose to enrich service provision, is currently the main strategic focus of EMBL, where research groups are developing technologies in imaging, chemical biology, computational modelling, microfluidics, robotics, X-ray optics, high precision mechanics, data acquisition, automation, omics technologies, bioinformatics and software development and integrated structural biology. Around every third EMBL scientist is an inventor - EMBL researchers make ca. 50 invention disclosures per year. In the last 20 years, EMBL researchers made 1060 invention disclosures, created 20-start-up and generated 100 mil EUR income.

ARISE AND MSCA

The ARISE Fellowship Programme is a Marie Skłodowska-Curie COFUND action (MSCA) led by EMBL. Candidates awarded an ARISE fellowship will be part of the prestigious group of MSCA fellows.

The MSCA, and through it the ARISE Programme, aims to provide the successful candidates with the necessary skills and international experience for a successful career, either in the public or the private sector.

ARISE will provide	An excellent research environment for development of cutting-edge technologies needed to speed up developments in life sciences.
	Unique professional training opportunities to learn skills specifically required by the leaders of the service providing facilities in research infrastructures
	Placements in the technology developing industry or academic organisations that provide service to other researchers through modern research infrastructures.
	Excellent training in transferable skills, networking opportunities and close supervision and mentoring.

ARISE calls for FELLOWs - INDICATIVE timeline

Each fellowship will be funded for a period of 36 months.

The figure below shows the indicative timeline of ARISE calls for fellows (deviations to the timeline might occur).

Icons made by Freepik from www.flaticon.com

Figure 4 – ARISE Programme indicative timeline

TECHNOLOGY DEVELOPMENT AND TRAINING

It is expected from the Fellow to dedicate 100% of their time to the Fellowship. Their work related to the Fellowship time should include following elements[1]:

Technology development work on the technology development project of their own choice (most of their time (ca. 60-70-%) should be dedicate to this activity).

Service provision (ca. 20-30% of their time):

Fellows are expected to provide their novel technology as a service to other scientists. Providing service to their own technology will serve two functions:

- *Allowing Fellow to improve their technology based on the feedback and experience of the other scientists using the technology*
- *Getting training in service provision*

Organisation of service provision should be in any case adjusted to the specificities of the technology that the Fellow is developing.

For example, it is probable that the Fellows will start providing service to their novel technology first to EMBL colleagues, to learn how the technology can be improved. Once

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[1] *% for distribution of activities is indicative, and based on the recommendations and experiences in other COFUNDS.*

the technology gets more mature, they will probably start offering it to external scientists as well.

Fellows can occasionally take part in additional service provision in the group, in order to get further training in providing services.

Communication and interaction with life scientists at EMBL – considering that most of the fellows will come from other disciplines (not life sciences), close interactions and integration in the life science community will represent an important training aspect that will allow Fellows to learn about current needs, model systems and interests of life scientists and consider them while developing novel technology.

Participation in all mandatory and elective **training activities**.

Interaction with other ARISE fellows.

Participation in ARISE communication activities.

LEARNING TO PROVIDE SERVICE AND MANAGE SERVICE PROVIDING RESEARCH INFRASTRUCTURES

Future RI Scientists need to learn how to operate and manage RIs, how to incorporate and stimulate technical innovation and entrepreneurship and how to operate in different sectors, disciplines or set-ups.

Fellows will learn these professional skills during **different types of courses** (**physical courses** (mostly provided during the ARISE school, some distributed throughout the fellowship time), **expert webinars** (online courses), **use case webinars** (interactive discussions with experts) and **secondments:** during mini secondments at partner organisations and intra-disciplinary secondments within EMBL, Fellows will shadow experienced RI managers and learn different ways to organize operations in RIs and provide access to technology to a wide variety of users.
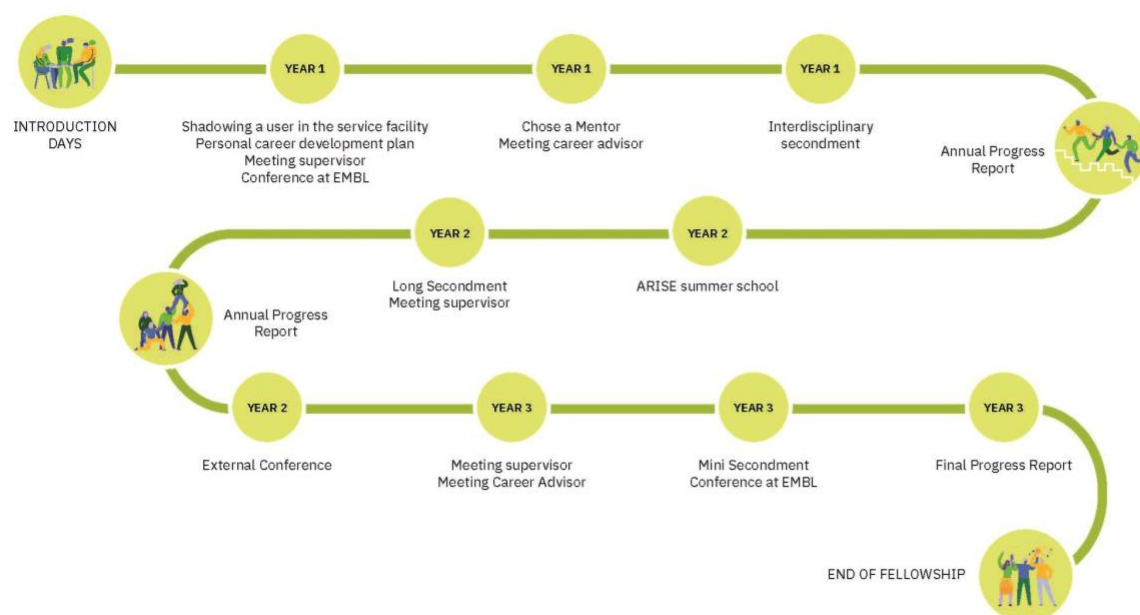
Figure 5 – Indicative timeline of an ARISE Fellowship

Table 1 - List of Professional skills training topics that will be covered during ARISE training

RI MANAGEMENT

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
Operations mgmt, designing, controlling and redesigning services	ARISE GTLs	mandatory	use cases
Budgeting	Finance Department	mandatory	Course/ expert webinar
Reporting	StratCom	mandatory	expert webinar
Health and Safety	Health&Safety, Corrina Gorny	mandatory	expert webinar
Instrument procurement	Evelyn Cudraz, EMBL Head of Purchase	mandatory	expert webinar
Costing up staff and compute requirements	EMBL-EBI, Sarah Butcher	mandatory	ARISE school
Costing up (new) services	ARISE GTLs	mandatory	ARISE school
Tracking multiple projects	EMBL-EBI, David Hulcoop	mandatory	ARISE school

Quality control	ARISE GTLs/RITrain	mandatory	expert webinar

SERVICE PROVISION

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
The service design process - uncovering hidden complexity	ARISE GTLs	mandatory	ARISE school
Define technologies needed for service provision	ARISE GTLs/Euro-BioImaging	mandatory	ARISE school
Position facility in organization strategically	ARISE GTLs	elective	use cases
Long term planning and sustainability	ARISE GTLs/Core for Life	mandatory	use cases
Marketing and visibility, social media	StratCom	mandatory	IARISE school
Impact assessment	Cath Brooksbank	mandatory	ARISE school
Establishing and managing a team of volunteers	Bio-IT	elective	expert webinar
Keeping the facility cutting edge	ARISE GTLs	mandatory	use cases

TECH TRANSFER AND ENTREPRENEURSHIP

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
IP and innovation cycle	EMBLEM	mandatory	ARISE school
Collaboration with industry	EMBLEM	mandatory	ARISE school
Technology transfer	EMBLEM	mandatory	Course/ expert webinar
Entrepreneurship	EMBLEM	mandatory	Course/ expert webinar
From academic facility to commercial service provision	IC or external	elective	Course/ expert webinar

Establishing a business plan	EMBLEM	elective	Course/ expert webinar

USER SUPPORT

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
Who are your users	ARISE GTLs	mandatory	ARISE school
How to broaden user base	ARISE GTLs	elective	use cases
How to run a user programme	EMBL-Hamburg ARISE GTLs	mandatory	expert webinar
Communication and dealing with external users	V. Matser, A. Hercules	mandatory	ARISE school
Training users	Bio-IT	mandatory	Course/ expert webinar
Course design	Bio-IT	elective	expert webinar
How to assess user satisfaction and integrate feedback.	Cath Brooksbank	mandatory	expert webinar
Understanding user needs and ways of working	ARISE GTLs	elective	expert webinar
Instrument ergonomics	Industry partner organisation	mandatory	expert webinar

SCIENCE POLICY

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
Data management	Josan Marquez	mandatory	Course/ expert webinar
FAIR data	EMBL-EBI	mandatory	Course/ expert webinar
Open access and Open Science	ELIXIR	mandatory	Course/ expert webinar
European Open Science Cloud Initiatives	JK Heriche; EOSCLife	mandatory	expert webinar

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
Ethical, legal and social implications	EMBL legal team, Ethics Committee and Sarah Morgan EBI	mandatory	ARISE school

PROJECT MANAGEMENT

Topic and title	Suggested trainer or EMBL department	Mandatory/ elective	Suggested format
General principles of project management	EMBL HR training	mandatory	Course/ expert webinar
Management of user projects (basic principles)	ARISE GTLs	mandatory	expert webinar
Management of user projects	ARISE GTLs	elective	use cases
Negotiation	EMBL HR training	elective	Course/ expert webinar
Conflict mgmt.	EMBL HR training	mandatory	Course/ expert webinar
Recruiting, managing, collaborating and more	Cath Brooksbank	mandatory	ARISE school
Supervision and mentoring	EMBL HR training	mandatory	Course/ expert webinar

The **ARISE school** will be compulsory 5 days school for all Fellows and will take place in year 2 of the Fellowship.

Preliminary agenda of the ARISE school

Day 1	**Introduction, opportunities and challenges** (starts at lunchtime to allow Fellows from all sites to arrive)
	Arrival, interactive introduction, identifying challenges
Day 2	**Designing and creating your service**
	The service design process - uncovering hidden complexity
	Marketing and visibility, social media
	Who are your users
	Communication and dealing with external users/
Day 3	**Operating your service**
	Define technologies needed for service provision

	impact assessment,		
	recruiting, managing, collaborating and more		
Day 4	**Financial and business management aspects of operating a service**		
	Costing up staff, compute requirements and (new) services		
	Tracking multiple projects		
Day 5	**Introduction to innovation, IPR and entrepreneurship**		
	IP and innovation cycle		
	Collaboration with industry		
	departure		

TRANSFERABLE SKILLS

All fellows will attend courses on transferable skills. Some of them are mandatory for all Fellows, while others are elective and should be taken when the fellow needs to master certain skills.

Table 2 - List of transferable skills training and suggested training providers

Diversity and inclusion issues	Div. & Equality Committee	mandatory	expert webinar
How to communicate with media	StratComm	mandatory	expert webinar
Build a productive team culture	HR training	mandatory	course
Communication, writing and presentation skills	HR training	mandatory	course
Personal effectiveness - time management	HR training	elective	course
Balance your different roles	HR training	elective	course
Manage your time better	HR training	elective	course
Delegate tasks more effectively	HR training	elective	course
Deal with different personalities in the team	HR training	elective	course
Stress management	HR training	elective	course
Local language courses	HR training	elective	course
Ally training	Div. & Eq. Committee	mandatory	expert webinar
Diversity and inclusion issues	Div. & Eq. Committee	mandatory	expert webinar

COMMUNICATION ACTIVITIES

All Fellows will gain practical outreach experience through following activities:

- Each Fellow will **support EMBL Strategy and Communications office and** the European Learning Laboratory for the Life Sciences (**ELLS**[2]) in their outreach activities for at least **two full days**

- Fellows will rotate in running the **Research Infrastructure Podcast** (two Fellows each month), explaining developments in RI, technologies and sciences, recent technology development highlights, interesting applications of the technology, challenges in the career development of RI Scientists and from the users' perspective.

- The PM will motivate Fellows to nominate themselves for the MSCA Fellow of the week.

SECONDMENTS

Each Fellow will do at least 4 secondments: 2 at **partner organisations**, and 2 at EMBL (one interdisciplinary and one shadowing of a user of similar technology). During the secondments, Fellows will stay employed by EMBL. Secondments will support development of research, professional and transferable skills.

The programme will provide financial support from the training budget for the secondments.

Table 3 – Secondments for ARISE Fellows

AT PARTNER ORGANISATIONS (one must be intersectoral)			
Type of secondment	**Benefit**	**Duration**	**Financial support**
Long secondment at partner organisation	Collaboration on Fellow's project, working experience in different sector, discipline or set-up;	2-6 months, preferentially in year 2	Up to 4300 euro

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[2] http://emblog.embl.de/ells/

18

| Mini secondment at partner organisation | shadowing other tech developers & service providers | up to 2 weeks, any time during fellowship | Up to 800 euro |

AT EMBL

Type of secondment	Benefit	Duration	Financial support
Interdisciplinary secondments within EMBL at other ARISE Group or Team (1 or more)	Understanding how different service providers operate and learning about different life science fields (e.g. bioinformatics Fellow shadowing genetics core facility)	Min 2 weeks in total, or more, based on the Fellows needs, any time during fellowship	Up to 500 euro
Shadowing a user of some of EMBL service providing teams	Understanding user needs, levels of knowledge, problems they are encountering, how a typical user thinks (e.g. join the basic course for the users of computational technology or follow the user who is using a service at e.g. core facility)	7 days during first 6 months of the Fellowship	n.a.

CAREER SUPPORT

All Fellows will be assigned **one supervisor at EMBL**, in which group they will perform research. Fellows will choose their supervisors during the selection process among ARISE GTLs. Supervisors will provide scientific, professional and career guidance to the Fellows and will be approachable on a daily basis. The supervisor will also introduce the Fellow to the scientific network in the area of research in which the Fellow is working, and ensure that the Fellow integrates well into the existing group and benefits from the expertise, knowledge and tools present in the lab and at EMBL.

Supervision & Mentoring
Personal career development plan
Competencies framework
Annual progress report
Half yearly progress meeting with the supervisor

CAREER SUPPORT

During the long secondment, Fellows will be assigned a second supervisor at the Partner organisation.

In addition to their supervisor, each Fellow will choose a **mentor** among other ARISE GTLs (if possible, of different gender), who can provide an additional set of skills and knowledge. The ARISE Programme Manager and the Career advisor will support the Fellow in this selection: Programme Manager will assemble a list of competencies and skills of all ARISE GTLs and the Career advisor will help Fellow identifying the ideal profile of their mentor. The mentor will participate in annual progress reports of the Fellow and provide professional and career guidance.

Fellows who, after their inter-sectoral secondment, express an interest in pursuing a career outside of academia, will be asked to identify additional **non-academic mentor** who will also join the annual progress report meeting.

Together with their Supervisor and Mentor, and career advisor, Fellow will develop their **Personal Career Development Plan (PCDP) listing Fellow's learning needs and suitable learning opportunities.** Individual PCDPs will be based on the **competency frameworks for future Research infrastructure scientists** (to be developed by ARISE): a list of competencies needed for different positions that the Fellows can take after their training is completed. Using the competencies framework, each fellow will identify their professional development needs, and based on this, identify matching learning opportunities.

On every progress meeting with the supervisor and mentor, Fellows will analyse the progress of their PCDP.

Career advising: ARISE programme will engage the career advisor who will individually meet with Fellows at the beginning of the fellowship and towards the end of the Fellowship, for individual consultation session.

Monitoring progress of the Fellows: Every 12 months, the Fellow will **have an official annual progress meeting** with the supervisor and the mentor, to discuss the achievements of the current year and the plans for the next, enter it in the Personal Career and Development Plan and submit the written report to the Programme Manager (PM). At least once in between the official progress meeting, the Fellow will have **additional progress meetings** with the supervisor.
Before the annual progress report, each Fellow will meet with PM to track progress of tasks related to training, career planning, research and outreach. In case of delay in the implementation of the PCDP, the PM will ask the supervisor and mentor(s) to identify reasons and work out a plan how to adapt the PCDP to catch up the delay. Should the Fellow require additional support, the PM will ask the supervisor, mentor and ExC to identify solutions. Every 6 months, the PM will report to the ExC on the progress of Fellows.

SELECTION OF FELLOWS

Each fellowship will be funded for a period of 36 months. In this time, the fellow will conduct a research project and a mandatory secondment to an ARISE partner organisation of their choice (academic or industry organisations).

ELIGIBILITY OF THE APPLICANTS

ARISE is an incoming programme, based on individual driven mobility of Fellows. Applicants can freely choose the research topics on which they wish to work, the hosting group (supervisor) and mentor, fitting their interests.

FORMAL ELIGIBILITY CRITERIA	
Mobility rule	The applicant must comply with the MSCA Mobility rule: Researchers from all countries are eligible for the MSCA ARISE Programme; however, applicants may not have carried out their main activity (work, studies, etc.) at any of the EMBL sites for more than 12 months in the 3 years immediately preceding the call deadline. Applicants cannot already be permanently employed by EMBL.
Education and experience	At the call deadline, the applicant should have at least **4 years of full-time equivalent research experience (in technology development),** a high level of skill (postdoctoral standard) or expertise in a specialisation in which doctoral degrees are not usually awarded. Applicants **do not have to hold a PhD** but must have required experience. Their degree and scientific experience should be in the

	STEM fields, in academia or non-academic sectors, relevant to the research fields of EMBL RIs and services.
Complete application	The applicant must submit a complete application with required documents and indicate GTLs and partner organisations (for secondments) in which they are interested.
Language	Applicants must be fluent in English.
No age limit	There is **no age limit** for applying to the MSCA COFUND Fellowship Programme although the candidates' achievements should be in line with their "academic age".

ACADEMIC ELIGIBILITY CRITERIA	
Applicant-driven research proposal	Applicants should independently prepare and submit their original **proposal to develop new or improve existing methods or technologies, which can be applied to different scientific questions of other researchers as a service and integrated into RIs**. The proposed project **should not be of local interest only**, but should have sufficient potential for international transfer. The proposal should be up to 4 pages long and relevant for the field of work of group(s) in which applicants are interested in joining. The proposal must follow EC Ethical guidance.
	Applicants are required to contact the groups of their choice before preparing the proposal to get an overview of their field of work and current activities of the groups, and discuss ideas for new technology development.
	A **template for the project proposal** writing is available here.
Experience	Applicants should describe their **experience in technology development related to service provision**
Scientific potential	Applicants should prove their scientific potential using at least one of the following evidences:
	- Scientific publications
	- Scientific Software, unique or problematic data sets, technical documentation, etc.
	- Contribution to patents
	- Management of technology development projects
	- Detailed description of any other innovative research they have performed and their achievements
	- Other ways to demonstrate experience relevant to technology development and scientific services

ARISE Fellows will be selected through selection process based on openness, transparency, merit, impartiality and equality for the researchers who are applying. Approximately 20 Fellows will be recruited per call.

EVALUATION PROCEDURE FOR THE SELECTION OF FELLOWS

Description of the selection process

1	**Publication of the call**	Advertisement and opening of the call by the **Programme manager (PM) and Programme Director (PD).** Follow-up of the application submission process.
	Application phase and open consultation period	Applicants approach GTLs of their choice to get an overview of their field of work and of current activities. When needed, project manager can be contacted for further support and instructions on how to prepare and submit the application.
2	**Eligibility check**	To be performed by the **PM,** based on the eligibility criteria. Eligible applications move to feasibility and ethics checks. Non-eligible applicants will be informed by the PM, with a justification for rejection.
	Feasibility check	**ARISE GTLs** chosen by the applicants report on the feasibility of the project and the capacity, expertise and infrastructure of their teams to support the proposal, independent of their own research activities and interests. They will also check the ethics self-assessment to verify if the proposed project arises any ethical issues.
3	**Evaluation and ranking of written applications**	Each application will be evaluated independently and remotely by three external international experts, members of the **Evaluation Board (EB)**. Applications are evaluated and ranked for their excellence using the evaluation criteria described in the table below. Unsuccessful candidates will be duly notified. Top candidates from the list will be invited to.
	Personal interviews of the top ranked applicants	**Panel interviews** will take place face-to-face (or online if physical meeting is not possible) in Heidelberg, Germany. Each panel will consist of 1 external international expert and 2 ARISE GTLs. Interviews will be done for ~45 mins, in English, and will consist of presentation of the research proposal and the career achievements of the applicant (10 min each), and panel discussion and questioning (25 mins). Candidates will be evaluated based on the Evaluation criteria. Unsuccessful candidates will be duly notified. In addition to panel interviews, applicants will be **interviewed Face-to-Face (F2F)/alone by ARISE GTLs** of their choice; it will be up to the candidate to seek out the interview with the group. GTLs and their groups will be available throughout the interview days(s). **If possible due to corona measures, the programme will support candidates to visit the groups and teams of their interests at other EMBL sites before the interview days.** At the same time candidates will have also a meeting with an EMBL HR experts and ARISE management.

	Final funding decision	Final funding decision will be made by the ARISE **Executive Committee (ExC)** and **the EB Chair and vice Chair based on the comprehensive evaluation of the candidate**. Candidates must accept the offer within **14 days** and choose which group they wish to join (if they received confirmation of supervision by more than one GTL).
4	**Feedback procedure**	At the end of each selection round, PM will inform all applicants about numbers of eligible and evaluated applications and number of selected fellows. Upon request by the candidate, the PM will communicate the report of the EB and Interview Panel about candidate's strengths and weaknesses, based on the evaluation criteria mentioned below, and ranking for each criterion.
Appeal procedure		Applicants can appeal after the three cut-off points: eligibility check, ranking by the EB and personal interviews. The **ARISE Advisory Committee (AC)** will investigate the concreteness and significance of the allegations; if significant irregularities in the procedures are noticed, the AC will devise a corrective measure for the current application (e.g., re-evaluation) and future selection rounds. However, in general, decisions of the EB, the Interview Panel and interviews by the ARISE groups will not be overruled. The Advisory committee is bound to strict confidentiality. A dedicated email address arise-appeal@embl.org for official complaints or formal appeals is accessible by the AC, which is bound to strict confidentiality.

Evaluation criteria

Candidate's written application and their performance on personal interviews will be evaluated based on following criteria:

Evaluation Criteria		Points	Weighting
The professional excellence of the applicant	The excellence of the candidate's previous achievements	1 - 5	**40%**
	Impact of their contribution to the research field	1- 5	
The excellence of the proposed project	Quality and novelty of the proposed project and the proposal	1 - 5	**40%**
	Fit with the team/institution of the host, secondment host and partners	1 - 5	
Potential and impact of the proposed project on the RIs	What is the potential of the proposed project to be included in the service catalogue of RIs	1 - 5	**20%**
	What would be the expected impact of that service (should the proposed technology be once included in the catalogue of the service providing RIs).	1 - 5	

Scoring system

For each criterion, the applicants can get up to 5 points (10 per category). Each category of criteria has an assigned weighting. Successful candidate must score at least 50% of the weighted points for each individual category of criteria and at least 70% of the total weighted points.

Possible points and their meaning	
1 (failure)	Relevant criteria are not sufficiently met
2 (poor)	Relevant criteria are met, but weaknesses are clearly visible
3 (satisfactory)	Relevant criteria are met, but with shortcomings
4 (good)	Relevant criteria are fully met
5 (excellent)	Relevant criteria are fully met and exceeded

INDICATIVE TIMELINE FOR THE FIRST CALL FOR FELLOWS

(Please note these dates are indicative and subject to change)

Open call	1 Sep – 30 Nov
Eligibility check	1 Dec – 8 Dec
Feasibility assessment by GTLs –	8 Dec – 15 Dec
Evaluation by the Evaluation Board:	16 Dec – 9 Jan
Panel interviews, interviews with the groups and with EMBL HR (depending on corona measures, probably still online)	Indicative timeframe 1 - 15 February
Decision to offer fellowships:	One week after the interviews
Deadline for accepting Fellowships	14 days after the offer
Eventual offer from reserve list	t.b.d.
Start of the Fellows	4 weeks after the offer if no visa is required.

EMPLOYEMENT AS AN ARISE FELLOW

ARISE Fellows will be employed as EMBL Research Fellows and all employment conditions that are applicable to the EMBL PostDoctoral Fellows apply to them as well. EMBL Research Fellows are entitled to the same fellowship rates as Postdoctoral fellows, plus allowances (family and child), incl. social insurances.

Fellowships are increasing every 12 months with the progression of the fellowship (see table below). In addition, fellowships are normally adjusted annually due to inflation. Fellows in union and with dependent children are eligible to receive family and child allowance.

Table 4 – Net salary of the ARISE Fellows [3]

EMBL Fellowship rates with effect from January 1 2021	Germany	France	Italy	UK	Spain
Monthly stipend (first year)	3.471,18 €	3.159,28 €	2.883,07 €	£2.869,24	2.774,04 €
Monthly stipend (second year)	3.818,29 €	3.475,21 €	3.171,38 €	£3.156,16	3.051,44 €
Monthly stipend (third year)	3.875,56 €	3.527,33 €	3.218,94 €	£3.203,50	3.097,21 €

E.g., A Fellow starting in May 2021 will receive ca. 3471 Euro/month until 30 April 2022, when the fellowship will increase to ca. 3818 Euro/month. In June each year we normally experience adjustment of our salaries according to the changes of the costs of living, so the whole table above gets updated once a year. In May 2022 the fellowship will increase again, based on the new table that was adopted in June 2021.

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[3] Gross Fellowships (stipend plus social security contributions) averaged for the period 1 May 2021 – 30 April 2024 and with estimated 1,5% inflation adjustment - Heidelberg/Hamburg: 4,669 €; Grenoble: 4,273 €; Italy: 4,129 €; Hinxton: 4,390 € (£ 3,920); Barcelona: 3,870 €.

PARTNER ORGANISATIONS

Fifty partner organisations (19 non-academic and 31 academic), submitted letters of intent to participate in the programme, describing their organisation, type and number of secondments they can provide and training opportunities at their premises. They offer Fellows a wide choice of 113 long secondment places a year (37 places in non-academic PO and 76 places at academic organisations). Thirty-six organisations offer to host mini secondments.

ARISE partner organisations will

- Host long and mini secondments of the Fellows

- Be invited to be mentors of ARISE Fellows as needed

- Assign additional supervisor for the Fellow during long secondments

- Delegate representatives to join ARISE Advisory committee

- Be involved in promotion of ARISE

Partner organisations **will not employ the Fellows**, but will provide supervision and training capacity during the secondments. **We are open to additional partner organisations**, should the Fellows benefit from them – please contact ARISE Programme Manager to discuss how can a new organisation join ARISE as Partner Organisation.

To become ARISE partner organisations, organisations need to

- Commit to providing training opportunities to ARISE fellows through secondments

- Have regulations on equality and diversity, supervision and evaluation of employees and health and safety in place, that are in line with the recommendation of the EC Charter and Code for Researchers[4]
- Sign the MoU with EMBL before the Fellow visits them for secondment, regulating IPR and responsibilities of all parties.
- Comply with open science and data management policy (as far as in line with the IPR regulations in the MoU with EMBL)

The full list of current ARISE partner organisation is available at ARISE website[5].

LONG SECONDMENTS
COLLABORATION ON
THE FELLOW'S PROJECT

SHORT SECONDMENTS
EXPERIENCE OF DIFFERENT
ENVIRONMENTS

TRAINING through SECONDMENTS

31 ACADEMIC + 17 NON-ACADEMIC
PARTNER ORGANISATIONS

Open for new partner organisations

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[4] https://euraxess.ec.europa.eu/sites/default/files/am509774cee_en_e4.pdf
[5] https://www.embl.org/about/info/arise/partner-organisations/

EQUALITY AND DIVERSITY

EMBL has been conferred with an HR Excellence in Research logo by the EC, in recognition of its progress in implementing the European Charter for Researchers and the Code of Conduct for Recruitment of Researchers. Everyone at EMBL has a responsibility to ensure that the standards of the policy are adhered to. Particular responsibility lies in the hands of **supervisors**, who must ensure that policy is implemented during all their decision-making processes (recruitment, promotion, pay reviews etc.), and ensure working environment within their control is free from unjustifiable discrimination, harassment and bullying. Moreover, all Fellows will attend Ally training to develop hard skills to practice *allyship* with minority groups.

Equal opportunities during selection process: The programme will be open to researchers from all over the world, respecting the MSCA mobility rule. The programme will specifically support application by **researchers at risk**, who have been displaced by conflict, or whose situation makes it difficult for them to pursue their careers. The support will be provided on a case-by-case basis by the Programme Manager.
For each selection round, the Programme Manager will assemble the Evaluation Board and assign the evaluators to applications, aiming for gender and seniority diversity, diversity of experience and expertise, making sure that there is no pre-existing link to the applicant and that max 20% of all EB members come from the same country. Evaluators will not evaluate applications from their own country or with other possible conflicts of interest. Programme Manager will also form one or more **Interview panels** balancing gender, seniority and expertise of their members.

To **ensure the gender balance**, we will promote technology development as a career for women, who are often minority in technology development fields; e.g. in advertisements

we will explicitly encourage women to apply and we will ask our alumni, ARISE partner organizations and collaborators of ARISE GTLs to directly encourage female researchers to apply. We will aim for gender, seniority and geographical balance when assembling ARISE committees, which might further encourage female researchers to apply.

ANNEX 1 – HOW TO APPLY
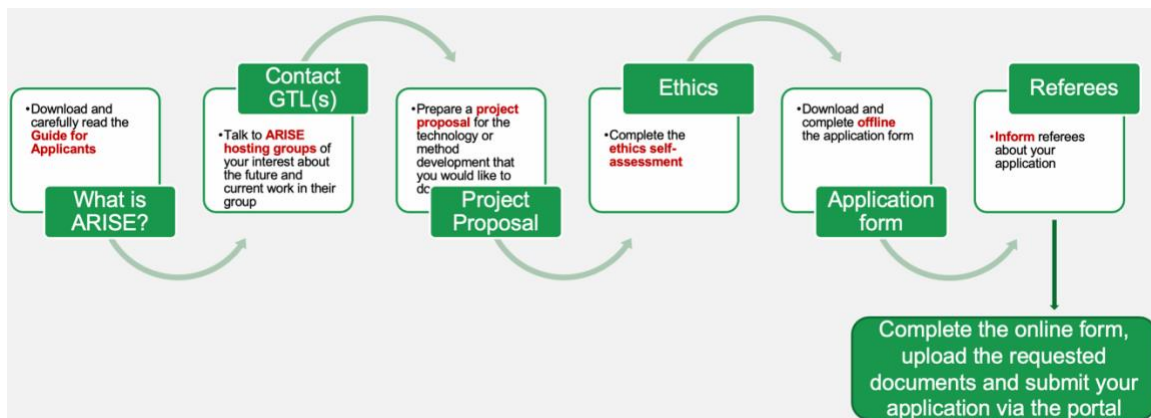
Resources available online (downloadable from ARISE website):

- Guide for applicants
- Project proposal template (mandatory)
- Ethics self-assessment template (mandatory)
- Application form (mandatory)

Tips & Tricks:

- Project proposal: must be novel and in line with the expertise and work of the group(s) you wish to join; useful for the broad scientific community and have the potential to be provided as a service when fully developed

- Use only the templates provided by ARISE team and do not modify them
- Automatic invitation to upload the reference letter is sent to the referees once the candidate submits the application
- Upload your documents all in PDF
- Remember to upload all the requested documents (e.g., project proposal including the ethics self-assessment, application form, relevant certificates)
- Remember to complete the information requested in the online portal
- Do not wait until last minute to submit your application
- In case of questions/problem, please contact us arise@embl.org

ANNEX 2 – ARISE CALL 2: LIST OF GTLS

The following EMBL group and team leaders are open for ARISE fellows in 2021 (alphabetically sorted).

ALEXANDROV THEODORE

Team Leader, Structural and Computational Biology Unit
EMBL Heidelberg

The Alexandrov team develops experimental and computational methods as well as software for spatial and single-cell metabolomics. We are seeking technology-focused method developers with experimental and/or computational skills or with expertise in software development to join us to develop next-generation services for ultrahigh-resolution spatial metabolomics.

Technology Fields: AI and machine learning, imaging, microscopy, software development, metabolomics
Life science fields: biotechnology, cell biology, developmental biology, epigenetics, neurobiology, tissue biology, metabolism

BATEMAN ALEX

Team Leader, Protein sequence resources
EMBL-EBI Hinxton

My group provides a wide range of world leading resources for protein and non-coding RNA sequence and families (InterPro, Pfam, RNAcentral & Rfam). We are particularly interested in applying modern ML/AI approaches to enhance our resources.

Technology Fields: AI and machine learning, bioinformatics, data management
Life science fields: bioinformatics research, computational biology, structural biology

PEER BORK

Director of EMBL Heidelberg (Scientific Activities)
Group Leader, Structural and computation biology Unit
EMBL Heidelberg

The computational biology group has developed and is maintaining Web services and resources on (meta) genomics and function prediction with more than 400.000 different users per month. The current focus is planetary biology that includes global microbial sampling and analysis, with needs for (meta) data organisation and visualization.

Technology Fields: bioinformatics, data science and big data, AI and machine learning
Life science fields: bioinformatics research, computational biology, planetary biology

CREVENNA ALVARO

Head of Microscopy Service
EMBL Rome

As the head of microscopy, I am using my expertise in optics, programming and image analysis for two purposes: a, to further develop imaging technology; and b, to establish complex platforms such as spatial transcriptomics, tissue profiling and correlative X-ray imaging/super-resolution microscopy. I aim at bringing these services for the wider European research community through academic or industry collaborations.

Technology Fields: automation, image analysis, imaging, microscopy
Life science fields: epigenetics, tissue biology

CROCKER JUSTIN

Group Leader, Development biology unit
EMBL Heidelberg

Our group builds automation and robotics pipelines for high-throughput developmental biology. We build experimental frameworks that will serve as platforms for future research by allowing a broader community of users to build, execute, and share similar technologies.

Technology Fields: automation, microfluidics, robotics
Life science fields: biotechnology, developmental biology, planetary biology

FINN ROB

Team Leader, Sequence Families
EMBL-EBI Hinxton

My group focuses on the analysis of the microbes found within the environment or associated with a host organism, such as humans or plants. DNA sequencing technologies have revolutionised modern molecular biology, facilitating large-scale sequencing of microbial genomes. However, concomitant with the data deluge, there is an urgent need to develop robust computational frameworks that enable these genomes to be rapidly and continually collated, compared, and functionally annotated. Capturing this biodiversity and presenting quality reference datasets enables biologists to gain a greater understanding of evolutionary biology and the adaptations microbes have made to enable them to survive in diverse environments.

Technology Fields: data science and big data, software development, bioinformatics
Life science fields: computational biology, genome biology, planetary biology

FLICEK PAUL

Associate Director of EMBL-EBI Services, Head of Genes,
Genomes & Variation Services
EMBL-EBI Hinxton

The Ensembl/GENCODE gene annotation, the leading reference annotation in the field of human and mouse genomics, is the fruit of 20 years of collaborative research,

involving a broad network of biologists, experimentalists and bioinformaticians across the world who study all facets of gene transcription, through the convergence of a wide variety of experimental datasets (ESTs, RNA-Seq, CAGE, ChIP-Seq, etc) and computational analyses (evolution, motif discovery, etc). Our work is foundational to the majority of human and mouse genomic studies, hence our utmost efforts to reach exceptional accuracy in our annotations.

Technology Fields: AI and machine learning, bioinformatics, data science and big data
Life science fields: bioinformatics research, computational biology, genome biology

FURLONG EILEEN

Group Leader & Head of Genome Biology Unit
EMBL Heidelberg

The Genomics Technology Development (GenTechDev) Team develops a range of state-of-the-art spatial, multimodal single-cell genomics technologies (e.g. Seq-FISH+) to advance genomic research throughout EMBL, building on our rich expertise in cutting-edge single-cell genomics technology development and imaging. The GenTechDev team work closely with EMBL's core facilities to support users throughout EMBL with their experimental design, technology development and initial data analysis, helping EMBL scientists to stay at the forefront of developments in single-cell (spatial) genomics.

Technology Fields: bioinformatics, data science and big data, image analysis, software development
Life science fields: computational biology, genome biology, tissue biology

GARCIA ALAI MARIA

Head of Sample Preparation and Characterization Facility
EMBL Hamburg

The SPC facility supports external and internal researchers carrying out structure determination experiments and has a strong track record in the development and implementation of new technologies and methods to precisely determine the stability, shape and size of different biomolecules and biomolecular assemblies. We develop our own software for the data analysis of biophysical interactions such as Kinetic analysis, Time resolved conformational changes, Analysis of thermal stability data beyond a simple melting temperature analysis, Ligand screening and Processing of spectral data.

Technology Fields: bioinformatics, chemistry and chemical biology, computational modelling
Life science fields: bioinformatics research, biophysics, structural biology

GROSS CORNELIUS

Group Leader, Neural control of instinctive behaviour
EMBL Rome

We have worked closely with the Prevedel group to apply innovative deep brain imaging technologies for use in behavioral circuit neuroscience applications. Via the ARISE programme we are looking to recruit outstanding postdoctoral fellows who are committed to focusing on technology that can be taken up and used successfully by the wider behavioral neuroscience community. Following the model we have used in the past collaborating with the Prevedel Group to adapt novel three photon microscopy and adaptive optics approaches to in vivo deep brain imaging in mice, we expect the ARISE fellow to push the boundaries of novel deep brain imaging technologies, adapt and establish them for use in living animals, and develop them for distribution to the wider behavioral neuroscience field.

Technology Fields: image analysis, imaging, microscopy, optical instruments development
Life science fields: neurobiology

HAASE KRISTINA

Group Leader, Tissue Biology and Disease Modelling Unit behaviour
EMBL Barcelona

Our group develops human disease models using primary and iPSC-derived cells and by in-house design and fabrication of novel microfluidic chips. Development of these models and associated assays (image-based and biological) are employed for vascular tissue engineering, drug development, and stem cell therapy applications and are at the core of our research. We interface with industrial and clinical partners to develop these models for practical real-world applications.

Technology Fields: image analysis, imaging, microscopy, microfluidics
Life science fields: biotechnology, translational research, disease modelling

HARTLEY MATTHEW

Team Leader, BioImage Archive behaviour
EMBL-EBI Hinxton

I have worked at the interface between computational BioImaging technology development and service provision for the last decade. Over that time, I have developed novel image analysis algorithms tools and pipelines as well as image data management software. I now lead the BioImage Archive (BIA), which provides services to the global BioImaging community. We work on image archival, visualisation, file formats, data models and data compression as well as AI and machine learning application to large image datasets. We provide services to life sciences researchers wishing to archive their image data across the world. Scientists using the BIA ecosystem number in the hundreds.

Technology Fields: data standards, software development, imaging, microscopy
Life science fields: bioinformatics research, computational biology, cell biology

KORBEL JAN

Group Leader, Genome Biology Unit
EMBL Heidelberg

Dr. Korbel's group is developing key experimental and computational methods for structural variation (SV) detection and functional dissection. In the past this has included the development of by now de facto standard methodologies used widely in human genetics and biomedicine, such as methods based on paired-end mapping, co-developed by Jan Korbel, which Science considered as one of the scientific breakthroughs of the year 2007. Recently, the group devised a method based on haplotype-resolved single cell DNA template sequencing, termed single cell tri-channel processing (scTRIP) which for the first time enables the scalable and direct detection of SVs including of structural mutational processes in single cells, and as is paves the way to obtain insights into disease pathomechanisms including cancer development.
We currently see exponential growth of the use of single cell DNA template sequencing (a.k.a. Strand-seq), with 10 laboratories having used the technique this year in collaboration with us and a strong upwards trend. Application areas include single cell sequencing of genetic variation, to single cell multi-omics and haplotype-resolved genomic assemblies. An ARISE fellow joining the Korbel group could be involved in transferring this novel technique into a high-throughput service for the community by

expanding its use beyond a pure research setting, and through advanced state-of-the-art instrumentation and miniaturization including via robotics and/or microfluidics, as well as big data analytical approaches. There will additionally be exciting opportunities to take part in international collaborations that will apply this technique to decipher sources of human genetic variation and their phenotypic consequences.

Technology Fields: automation, robotics
Life science fields: computational biology, genome biology, translational research

KOSINSKI JAN

Group Leader, Integrative modelling of infection cycles
EMBL Hamburg

We develop software for structural modeling of macromolecular complexes. Our main software is Assembline, a pipeline for modeling complexes by integrating data from cryo-electron microscopy, tomography, and other techniques such as crosslinking mass spectrometry. Another program, Xlink Analyzer, serves as a graphical interface to Assembline and a tool for analyzing crosslinks and models. In the future, we aim at developing more efficient modeling algorithms, improving user interfaces, creating modeling web services, and extending our methodology with recently developed modeling algorithms based on deep learning. These developments will enable new types of software solutions and services in structural biology.

Technology Fields: AI machine learning, computational modelling, software development
Life science fields: structural biology, structure modelling, biophysics

KRESHUK ANNA

Group Leader, Cell Biology and Biophysics Unit
EMBL Heidelberg

Kreshuk Lab develops novel machine learning-based methods for microscopy image analysis, in collaboration with both internal and external scientists. To make such methods accessible to scientists without computational expertise, we also develop and maintain the ilastik software, used by thousands of biologists all over the world.

Technology Fields: AI and machine learning, image analysis, software development

Life science fields: cell biology, developmental biology, structural biology

LEACH ANDREW

Head of Chemistry Services
EMBL-EBI Hinxton

We develop and deliver world-leading data and informatics resources, including ChEMBL, that enable important practical drug discovery questions to be addressed (e.g. "which target is best for this disease?"; "what molecule should I make next?"; "is this compound likely to be toxic?"). Our work involves leading technologies in cheminformatics, data science, software engineering, machine learning, AI and text analytics (among others) and team members develop skills that are in high demand in industry and academia.

Technology Fields: AI and machine learning, software development, cheminformatics
Life science fields: structural biology, drug design, computational biology

MAHAMID JULIA

Group Leader, Structural and Computational Biology Unit
EMBL Heidelberg

Cellular cryo-electron tomography (cryo-ET) is the only method available for obtaining in situ structural information across scales - from whole cells to individual macromolecules. Fellows in the ARISE program can engage in any of the following developments of innovative technology solutions to advance in-cell cryo-ET to a higher level of robustness: engineering and 3D microprinting of tailored specimen carriers, correlative (super-resolution) light and electron microscopy, automation of cryo-focused ion beam thinning and lamella lift-out, advanced software development for computational analysis. We are engaged in a large number of internal and external collaborations that lend our expertise to a wide range of biological questions, and work with industry partners for instrumentation development.

Technology Fields: imaging, microscopy, automation, software development
Life science fields: biophysics, structural biology, computational biology

MARQUEZ JOSÉ

Head of Crystallisation Facility
EMBL Grenoble

Our Team has pioneered the development of Online Crystallography; fully automated protein-to structure pipelines integrating crystallization, synchrotron data collection and crystallographic data analysis into continuous workflows operated via the web. These pipelines are currently used by hundreds of scientists worldwide and are based on the CrystalDirect technologies and CRIMS software, which we have contributed to develop. Recently, we have implemented a fully automated pipeline for ligand and fragment screening to support structure guided drug design. EMBL Grenoble is co-located with the European Synchrotron Radiation Facility (ESRF) in Grenoble, which produces some of the world's most brilliant X-ray beams worldwide. EMBL and ESRF jointly operate six crystallography beamlines one of which is the fully automated MASSIF-1 whose operation is highly integrated with the operations at EMBL's HTX Lab. Our interdisciplinary team offers opportunities for scientists, engineers and software developers to work in one of the leading infrastructures for structural biology within the areas of protein crystallography, drug desing, automation, and large-scale scientific data management and analysis. Currently, we are particularly interested in profiles in structural biology or computer science orientated towards one or several of the following areas: fragment screening, structure guided drug design, cloud computing, machine learning and artificial intelligence.

Technology Fields: AI and machine learning, chemistry and chemical biology, data management, data science and big data
Life science fields: drug design, structural biology, translational research

MARTIN MARIA-JESUS

Team Leader, Protein Function Development
EMBL-EBI Hinxton

Our work focuses on developing technologies for the delivery of scalable and robust data infrastructures for protein data (SQL and NoSQL databases, programming languages, Graph Knowledgebases, Apache Lucene and Solr search engines, clustering algorithms) as well as developing novel data mining methods for protein function prediction and large-scale data analysis. The team use Deep Learning algorithms for extracting knowledge from biological data and recommendation systems.

> **Technology Fields: AI and machine learning, bioinformatics, data management**
> **Life science fields: bioinformatics research, computational biology**

MATTEI SIMONE

Team Leader, Structural and Computational Biology Unit
EMBL Heidelberg

Our team is part of the EMBL Imaging Centre, a new service unit with the mission to make the cutting-edge electron and light microscopy technologies available to the scientific international user community, including academically developed methods not yet commercially available. We develop methods and software supporting cryogenic correlative light and electron microscopy (cryo-CLEM) and high-throughput fully automated pipelines to tackle the current challenges in cryo-EM sample preparation and screening.

Technology Fields: automation, image analysis, imaging, microscopy
Life science fields: biophysics, cell biology, structural biology

MCCARTHY ANDREW

Team Leader, Synchrotron Crystallography Team
EMBL Grenoble

The McCarthy team is composed of engineers and scientists who provide operational and user support on seven high brilliance X-ray based structural biology beamlines with proven expertise in developing automated data collection instruments and methods in collaboration with our colleagues at the European Synchrotron Radiation Facility (ESRF). We will continue to optimise data collection protocols and analyses methods as well as develop and expand the experimental instruments and techniques currently available in order to realise the scientific potential of the recently completed ESRF-Extremely Brilliant Source upgrade for the European structural biology community.

Technology Fields: automation, chemistry and chemical biology, data management, software development
Life science fields: biophysics, drug design, structural biology

MCENTYRE JOHANNA

Associate Director of EMBL-EBI Services, Head of Literature Services
EMBL-EBI Hinxton

Using machine learning to find information buried in the research literature promises to change the way we do literature searching and more specifically at EMBL-EBI, will help curators add key information to data resources such as UniProt, the PDB, IntAct, and Reactome. The Europe PMC publications database provides a rich data source for the development of text mining techniques to extract key entities or assertions, rank article results, or article classification, in collaboration with one more curated data resource at the EBI.

Technology Fields: AI and machine learning, data management   data, science and big data, software development
Life science fields: bioinformatics research, computational biology

MÜLLER CHRISTOPH

Group Leader & Head of Structural and Computational Biology Unit
EMBL Heidelberg

We will develop the use of chemoproteomics for the isolation of various macromolecular complexes and their analysis by single-particle cryo-EM. Through the ARISE program, we will establish workflows that use chemical probes targeting different classes of macromolecular complexes via high-affinity binding or covalent modification for isolation and characterization by single-particle cryo-EM. A broad range of chemical probes, different linker lengths, and isolation protocols will be explored. Optimized protocols will be integrated into an automated high-throughput cryo-EM screening workflow to increase throughput and support lead optimization in the drug discovery projects.

Technology Fields: automation, data management, imaging, microscopy
Life science fields: biophysics, drug design, structural biology

PAPATHEODOROU IRENE

Team Leader, Gene Expression
EMBL-EBI Hinxton

Cellular and organismal phenotypes are described via EMBL-EBI's resources: Expression and Single Cell Expression Atlas, for gene expression; PRIDE, for protein expression. Integration in a single platform of gene and protein expression data is quite challenging, requiring novel analysis (including e.g. artificial intelligence approaches) and/or visualisation techniques for biologists to take full advantage to having gene and protein expression side by side and uncover relationships between gene and protein expression within and across different species, in baseline or diseased conditions.

Technology Fields: AI and machine learning, bioinformatics, software development
Life science fields: bioinformatics research, computational biology

PAPP GERGELY

Team Leader, Instrumentation Team
EMBL Grenoble

The EMBL Grenoble Instrumentation team develop methods and instruments for Macromolecular X-ray crystallography and Small Angle X-ray Scattering experiments for more than two decades. Furthermore, motivated by the increasing scientific interest in Cryo-Electron Microscopy in the last decade, a project for automated Cryo-EM sample grid preparation and control (EasyGrid) has been conducted. The team is composed of highly motivated mechanical, electronics and software engineers, and is able to design and manufacture in-house high precision, complex scientific instruments. Scientific projects exploiting these machines and pushing them to their limits are essential to keep the activity of the team at the state of the art.

Technology Fields: automation, image analysis, software development
Life science fields: drug design, structural biology

PEPPERKOK RAINER

Director of Scientific Core Facilities and Scientific Services
Head of Advanced Light Microscopy Facility
EMBL Heidelberg

The Advanced Light Microscopy Facility (ALMF) and Pepperkok Team at EMBL Heidelberg develop and provide a service in advanced light microscopy and image analysis methods to EMBL scientists and external users from and beyond EMBL member states. Currently we are working on projects developing technology to provide a service in spatial multi-omics/phenomics to integrate automated phenotype recognition in complex biological samples by advanced light microscopy and online image analysis to sort the phenotypes for subsequent (single cell) multi-omics analyses.

Technology Fields: automation, image analysis, imaging, microscopy, microfluidics
Life science fields: bioinformatics research, biophysics, cell biology

PREVEDEL ROBERT

Group Leader, Cell Biology and Biophysics Unit
EMBL Heidelberg

We are developing advanced optical imaging methods that are based on multi-photon microscopy, active wave-front shaping, photo-acoustics as well as high-resolution spectroscopy. Our aim is to establish our new approaches as disruptive technologies in the life sciences and to further engineer and automate our prototypes for routine service provision.

Technology Fields: automation, imaging, microscopy, software development
Life science fields: biophysics, developmental biology, neurobiology

RIES JONAS

Group Leader, Cell Biology and Biophysics Unit
EMBL Heidelberg

The Ries group develops superresolution microscopy methods based on single-molecule localization microscopy (SMLM) and MINFLUX. With new optical and computational approaches, we push the resolution of microscopy towards the nanometer scale to enable imaging the structure and dynamics of multi-protein machines in cells.

Technology Fields: image analysis, imaging, microscopy, software development
Life science fields: biophysics, cell biology, structural biology

SARKANS UGIS

Team Leader, Functional Genomics Development
EMBL-EBI Hinxton

Our team builds and maintains the BioStudies database - a resource that facilitates transparent, reproducible science by aggregating and publishing all outputs of a scientific study. This can include pointers to components of data in specialised community resources, as well as data that do not belong anywhere else. BioStudies acquires data via a variety of routes, both pre- and post-publication. The main challenge for us is to find the right balance between the generic nature of this infrastructructure necessary to support a wide variety of users on one hand, and the ability to adjust the system to the specific needs of a particular user community, project, or data type on the other hand.

Technology Fields: data management, software development
Life science fields: computational biology, bioinformatics

SAVITSKI MIKHAIL

Team Leader, Stability proteomics for assessing the state of the proteome
EMBL Heidelberg

Savitski group is closely linked to the Proteomics core facility, with Mikhael Savitski leading both the facility and the group. Infrastructure in the Proteomics Core Facility is centred around state-of-the-art mass spectrometry for MS and LC-MSMS experiments. This is complemented by chromatographic and electrophoretic systems for protein and peptide separation. The research team uses and develops stability proteomics for understanding the phenomenon of aggregation and disaggregation, cell phenotyping, and detection of protein interactions with drugs, metabolites, DNA and RNA.

In future we plan to work on characterization of protein complexes from cell lysates without extensive purification.

Currently protein crosslinking is established for highly purified complexes at the EMBL proteomics core facility and is widely used. However, pioneering work has shown that cross linking of proteins in complex mixtures is possible. Here it would be very beneficial to combine sample fractionation approaches that can separate complexes and reduce sample complexity with protein cross linking in order to deduce structural information. Such technology development would enable systematic characterization of protein complexes without the need of in-depth purification. A robust implementation of this workflow would greatly accelerate unbiased protein complex characterization and the resulting service would appeal to a large number of EMBL groups interested in protein complexes and protein interactions as well as the broader scientific community in Europe. In particular, as science moves beyond model organisms such an unbiased technology will accelerate greatly functional characterization of ecologically important, but so far understudied species.

To be able to do this, we will need to establish complementary fractionation techniques for fractionation of whole cell samples of different sources (prokaryotic and eukaryotic cells) and implement crosslinking mass spectrometry in the medium complexity samples collected from the different fractions.

With this line of future research, we aim to strenthen our expertise in development of instrument methods, mass spectrometry and optimization and development of biochemical (fractionation, crosslinking) approaches.

Technology Fields: chemistry and chemical biology
Life science fields: molecular biology, biotechnology, biophysics

SAWITZKE JIM (JAMES)

Head of Genetic & Viral Engineering Facility
EMBL Rome

For internal and external clients, the Genetic & Viral Engineering Facility design and construct new viral cargos which can be delivered to cells or mice for labelling, gene editing, epigenetic modification or gene therapy. We are also developing new technologies and methodologies using these viral tools to more rapidly, accurately, and at a higher frequency create targeted DNA changes in a way that is more accessible to a wide range of researchers.

Technology Fields: genetic engineering, virology, molecular biology
Life science fields: biotechnology, neurobiology, genome engineering

SCHNEIDER THOMAS

Joint Head of Research Infrastructure, Group Leader
EMBL Hamburg

EMBL Hamburg is operating synchrotron beamlines for macromolecular crystallography for several, decades. Currently, we are using radiation from PETRA III for which an upgrade to the next generation synchrotron technology is in the planning. For making synchrotron radiation usable for scientific user community we are constantly developing software for controlling high-rate and high-volume data acquisition, automated sample handling, data flows and data evaluation. A large part of this work takes place in international consortia.

Technology Fields: software development
Life science fields: biophysics, structural biology

SCHWAB YANNICK

Team Leader, Cell Biology and Biophysics Unit
EMBL Heidelberg

The Electron Microscopy Core Facility at EMBL is committed to provide access to state-of-the-art methods in cellular electron microscopy to a large user baser from EMBL, its member states and beyond. Besides advanced methods for ultrastructural analysis, the

EMCF is specialized in CLEM, in volume SEM and has recently developed workflows for high throughput TEM tomography data collection.

Technology Fields: automation, imaging, microscopy, software development
Life science fields: cell biology

TRIVEDI VIKAS

Group Leader, Tissue Biology and Disease Modelling Unit
EMBL Barcelona

Trained as an engineer (focus: mechanical engineering and bioengineering), I switched to optics and instrumentation during my PhD where I developed 2-photon light sheet imaging-based methods for deep and fast imaging. Current technological focus of my group is development of novel embryonic organoids and high-throughput, long term monitoring of such in vitro systems and therefore demands automated systems for protocol optimization and molecular characterization through staining, all of which can be provided as services to labs both within and outside EMBL as well as in industry.

Technology Fields: automation, high-precision mechanics, robotics
Life science fields: biotechnology, translational research, tissue engineering

VELANKAR SAMEER

Team Leader, Protein Data Bank in Europe
EMBL-EBI Hinxton

Our work is focused on developing a scalable, state-of-the-art, integrated data management and delivery infrastructure for structural biology data (SQL databases, programming languages, Graph Knowledgebases, Apache Lucene and Solr search engines, clustering algorithms). We are keen on deploying machine learning and AI approaches for deriving knowledge from our integrated structural biology knowledge base. Our technology development work also involves better information retrieval and ranking systems and multiscale structural data visualisation tools (https://github.com/molstar) to enable scientific research in both academic and industry settings.

Technology Fields: AI and machine learning, data science and big data, information retrieval & relevance ranking
Life science fields: bioinformatics research, structural biology, translational research

VIZCAÍNO JUAN ANTONIO

Team Leader, Proteomics resources and tools
EMBL-EBI Hinxton

Improving PRIDE's functionality as the world-leading proteomics data repository, and the integration of proteomics data with other omics data types are two key aspects for the team in the near future. This offers the possibility for the fellow to work in different topics (e.g. data analysis, data visualisation, infrastructure, data management practises, etc), depending their background. In the context of data integration, this would involve different data types such as gene and protein expression information (together with Expression Atlas), post-translational modifications (UniProt), and (meta)proteomics data and (meta)genomics sequences (Ensembl, MGnify). Additionally, support in PRIDE for additional proteomics data types (e.g. top down proteomics, non-mass spectrometry methods) is also a key aspect in our future work.

Technology Fields: bioinformatics, data science and big data, software development
Life science fields: bioinformatics research, computational biology, proteomics

WILLMANNS MATTHIAS

Head of EMBL Hamburg, Structure and function of molecular machinery for protein translocation across membranes
EMBL Hamburg

Our group employs an integrated structural biology approach using X-ray based methods, single particle cryo-electron microscopy, biophysical methods and integrative modelling approaches for large protein complexes. Our structures provide rich opportunities to discover function from structure, where many of them aim to resolve mechanisms relevant for infection processes. In the coming years we aim to generate a multidisciplinary metabolomics/structure service platform for determination of turnover mechanisms of specific drugs or prodrugs by different microorganisms. The platform will include establishment of a pipeline for high resolution structures of selected protein-drug complexes in microorganisms, and in-vitro analysis of the enzymatic processing of specific drugs by microorganisms. The platform will thus integrate technologies in structural biology and metabolomics, complemented by microbial genetics and biochemistry, defining the required skill set of the developer we are looking for. All data generated will be stored a common data base, as a basis for further improving the integration of procedures. The platform will be useful to both future internal EMBL projects specifically from selected transversal themes (especially

microbiome, infection, planetary biology) and for our external user community working on drug discovery in industry and academia.

This work will build on our previous and ongoing work with Michael Zimmermann research group (EMBL Heidelberg). Previously we jointly discovered a mycobacterial drug target by a combined structure-based and metabolomics approach to be associated with an unexpected catalytic function, when Michael was working as graduate student at the ETH Zurich (Ehebauer, Zimmermann et al, 2015). In an ongoing pilot project with Michael's research group at EMBL, we have initiated a structure-based functional drug transformation project of selected microbiome targets with evidence for specific drug turnover, but lacking any mechanistic insight into the underlying process. At the present stage, the project connects high-resolution structural biology with biochemical and metabolomic approaches, including in vitro enzymology, as well as ex vivo and in vivo functional assays. In a first step, we determine the high-resolution structures of these targets, coupled by the identification of specific substrates suitable for turnover, including established drugs that are processed by these targets. Part of this analysis is the quantitative measurement of binding affinities, as a prerequisite for structure-based binding studies. As binding in enzymatic reactions is generally weak this may require, depending on the specific target, intervention with the active site topography to strengthen binding and to avoid rapid turnover, which would prevent structure-based ligand binding studies as well. Subsequent protein target ligand structures provide then the basis for mechanistic investigation of the turnover mechanism for specific drugs or prodrugs.

In a future perspective this knowledge could be further exploited either by protein engineering e.g. using directed evolution approaches or by medicinal chemistry approaches for rational modification and improvement of established drugs. In addition, as this concept is not limited to the characterisation of drug transformation it could be similarly applicable to other metabolites susceptible to microbial enzyme catalysis such as nutrients or environmental toxins.

Technology Fields: automation, chemistry and chemical biology, data management
Life science fields: biophysics, drug design, structural biology

ZIMMERMANN MICHAEL

Group Leader, Structural and Computational Biology Unit
EMBL Heidelberg

In combination with EMBL's Chemical Biology Core Facility (CBCF) our laboratory combines high-throughput screening and computational approaches to develop tools and pipelines to investigate the mutual interactions between environmental contaminants and biological systems. In this context we are currently establishing a

platform available to EMBL and Non-EMBL researchers that involves chemical libraries, screening pipelines together with computational tools, software, and data resources that will enable integrative analyses of the impact of environmental toxins on organisms at the molecular level.

Technology Fields: chemistry and chemical biology, data science and big data, software development
Life science fields: computational biology

ZIMMERMANN TIMO

Team Leader, Cell Biology and Biophysics Unit
EMBL Heidelberg

In the new EMBL Imaging Centre the Zimmermann Team will provide a wide range of light microscopy instrumentation that is not yet commonly available to external researchers. We also aim to efficiently connect highest resolution LM approaches (including cryo-fluorescence) to the corresponding EM technology offer of the Imaging Centre.

Technology Fields: image analysis, imaging, microscopy
Life science fields: biophysics, cell biology