



Organ on Chip in Development (ORCHID)

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Questionnaire

This questionnaire aims at surveying the training needs of the Organ-on-Chip community to promote the Organ-on-Chip systems qualification, usability, uptake and long-term development in a variety of fields.

Organ-on-Chip applications in Basic Research, Pharmaceutical Drug Development, Safety assessment of Drugs, Cosmetics and Chemicals among others is facing an exponential rise in interest. Therefore, specific training is required on the production of such cell culture systems using advanced microfabrication techniques and adequate on-chip characterization of relevant cell functions. This survey is directed to those we considered to be the current and future strategic stakeholders in the advance and use of Organ-on-Chip. On the one hand, we aim at preparing scientists and technicians for new types of employment that will arise while, on the other hand, providing industry and academia with professionals able to keep up with innovation in the field. The answers to this survey will contribute to designing appropriate training programs to fulfil the needs of this emerging field; the data resulting from the survey will be publicly available on the [ORCHID website](#).

This survey will take only 5 to 10 minutes of your time.

Section 1 – Professional profile

1) How would you define yourself as a professional? Please select the following options:

a) Type of institution (maximum of 2)

- Academia
- Industry
- SME (as defined by H2020¹)
- Governmental Organization
- Non-Governmental Organization
- Hospitals
- Other (please specify) _____

b) Job Level (only 1)

- Head of Institution/Top Management
- Senior Officer/Middle Management/Principal Investigator/Associate Professor
- Technical Officer/Staff Scientist/Post-doctoral Fellow
- Other (please specify) _____

c) Field of work (maximum of 2)

- Basic Research
- Applied Research
- Pharmaceutical Industry
- Clinic
- Cosmetics or Chemical Industry

¹ http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

- Food Industry
 - Other (please specify) _____
- d) Field of Graduate University education (Bachelor Degree) (Select only 1)
- Engineering (Mechanical, Materials, Chemical, Electrical)
 - Bioengineering (Biotechnology, Biomedical)
 - Physics
 - Biochemistry
 - Biology
 - Medicine
 - Pharmacology
 - None
 - Other (please specify) _____
- e) Field of first Postgraduate University education (Master Degree) (Select only 1)
- Engineering (Mechanical, Materials, Chemical, Electrical)
 - Bioengineering (Biotechnology, Biomedical)
 - Physics
 - Biochemistry
 - Biology
 - Medicine
 - Pharmacology
 - None
 - Other (please specify) _____
- f) Field of second Postgraduate University education (Doctorate Degree) (Select only 1)
- Engineering (Mechanical, Materials, Chemical, Electrical)
 - Bioengineering (Biotechnology, Biomedical)
 - Physics
 - Biochemistry
 - Biology
 - Medicine
 - Pharmacology
 - None
 - Other (please specify) _____
- g) Main area of expertise (Select a maximum of 2)
- Materials Science
 - Microfabrication / Microfluidics
 - Automation / Process engineering
 - Cell Biology / Molecular Biology
 - Genomics / Multi-omics
 - Pharmacology / Toxicology
 - Clinical Sciences
 - Other (please specify) _____

2) Select the **tissues/organs/systems/biological functions** with which you are familiar and/or you work with?

- Skin
- Eye
- Heart
- Liver
- Gut
- Adipose tissue
- Brain
- Peripheral nervous system
- Tumour
- Vascularization
- Immune system
- Blood
- Pancreas
- Thyroid
- Muscle
- Kidney
- Lung
- Bone/Cartilage
- Reproductive System
- Exocrine glands
- Not familiar with any specific tissues/organs/systems/biological functions
- Others (please specify)_____

3) Select the **microfabrication techniques** for polymer-based microfluidic devices with which you are familiar and/or you work with?

- Soft Lithography
- Glass / silicon processing (e.g. etching, DRIE)
- Large area / thin-film processing
- Embossing (e.g. hot embossing, ultrasonic embossing)
- Replica molding
- Microcontact printing
- 3D printing
- Micromilling
- Laser structuring (e.g. cutting, ablation)
- Injection molding
- Not familiar with any microfabrication technique
- Others (please specify)_____

Section 2 – Opinion on the state of Organ-on-Chip field development

4) **How important** are the following aspects for the Organ-on-Chip field development? (Select one per line)

	Very Important	Somewhat Important	Not Sure	Not Now	Not Important
Microfabrication techniques					
Production scale-up of Organ-on-Chip systems					
Definition of specific cell culture standards – function and origin of cells					
Sensors integration and real-time monitoring					
High throughput cultivation and endpoint measurements					
Qualification of the models					
Usability					
Uptake by scientists from other fields					
Training					
Other (please specify)					

Section 3 – Specific training needs

5) **How important** is it to provide **specific training** for each of the following stakeholders, to promote the Organ-on-Chip systems qualification, usability, uptake and/or long-term development? (Select one per line)

	Very Important	Somewhat Important	Not Sure	Not Now	Not Important
Scientists as <u>developers</u>					
Scientists as <u>end users</u> (Academia)					
Scientists as <u>end users</u> (Industry)					
Scientists as <u>decision-makers</u> (Regulators, Grant evaluators or peer reviewers)					
Technicians					
Clinicians					
Other (please specify)					

6) **At which level do you consider that specific training** is necessary to promote the Organ-on-Chip systems qualification, usability, uptake and/or long-term development? (Select one)

- Postdoctoral researchers
- Postgraduate Students (Doctorate studies)
- Postgraduate Students (Master studies)
- Undergraduate Students (Bachelor Studies)
- Other (please specify) _____

7) **How important** are the following elements to consider for training, for each of the following stakeholders, regarding the improvement of Organ-on-Chip systems qualification, usability, uptake and/or long-term development? (Select one per line)

- a) For Scientists as developers
- b) For Scientists as end users (Academia)
- c) For Scientists as end users (Industry)
- d) For Scientists as decision-makers (Regulators, Grant evaluators or peer reviewers)

- e) For Technicians
- f) For Clinicians

The following table will be repeated for all of the groups a) to e)

	Very Important	Somewhat Important	Not Sure	Not Now	Not Important
Biomaterials					
Microfabrication techniques and manufacturability					
Microfluidic principles					
Cell culture and stem cell technology					
Bio banking, Data Management and Protection					
Monitoring and analysing (molecular biology / omics)					
Monitoring and analysing (sensors, imaging)					
PKPD modelling					
Pharmacology and Toxicology principles					
Quality Assurance					
Science Communication					
Regulatory affairs					
Ethics					
Other (please specify)					

8) What is the most **adequate complexity level of specific training** for each of the following stakeholders, to promote Organ-on-Chip systems qualification, usability, uptake and/or long-term development? (Select the most adequate)

	Deep knowledge/ Theoretical and practical skills	Competence/ Theoretical skills	Competence/ Practical skills	Introductory/ Awareness	None
Scientists as <u>developers</u>					
Scientists as <u>end users</u> (Academia)					
Scientists as <u>end users</u> (Industry)					
Scientists as <u>decision-makers</u> (Regulators, Grant evaluators or peer reviewers)					
Technicians					
Clinicians					
Other (please specify)					

9) What is the most **adequate amount of specific training** for each of the following stakeholders, to promote Organ-on-Chip systems qualification, usability, uptake and/or long-term development? (Select the most adequate)

	Specific postgraduate course (1 to 2 years)	Seminars or courses integrated in a broader training programme (1 semester)	Up to approx. 20 h of practical training	Up to approx. 20 h of non-practical training	None
Scientists as <u>developers</u>					
Scientists as <u>end users</u> (Academia)					
Scientists as <u>end users</u> (Industry)					
Scientists as <u>decision-makers</u> (Regulators, Grant evaluators or peer reviewers)					
Technicians					
Clinicians					
Postgraduate Students (Doctorate studies)					

Postgraduate Students (Master studies)					
Undergraduate Students (Bachelor Studies)					
Other (please specify)					

(The following Question 10 is conditional: It will appear only if the Box “Seminars or courses integrated in a broader training programme” is selected)

10) **How important** would it be to include the topic of Organ-on-Chip technologies as a seminar of course in the following broader field(s) of education:

	Very Important	Somewhat Important	Not Sure	Not Now	Not Important
Engineering (Mechanical, Materials, Chemical, Electrical)					
Bioengineering (Biotechnology, Biomedical)					
Physics					
Biochemistry					
Biology					
Medicine					
Pharmacology					
None					
Other (please specify)					

Conclusion

The Deliverable D3.3 has been achieved in time.