Italian Centro3Rs commitment

1 year after the opening of the activities

Anna Maria Bassi

An Italian not-for-profit platform for the promotion of 3R’s Principles in scientific and teaching environments according to the EU Directive 2010/63 for the protection of animals used for scientific means.
**3Rs TIMELINE IN EUROPE & ITALY**

- **1959**: Foundation of ECVAM, "The principle of Human experimental techniques" Russell and Burch
- **1991**: European Directive 2010/63/EU “Member states must follow the principle of replacement, reduction and refinement”
- **2010**: Italian Health Ministry set up a Working Group for the promotion of alternative methods to replace the use of animals for scientific purposes
- **2014**: Directive translated into Italian law: DL 2014/26 on the protection of animals used for scientific purposes
- **2016**: Centro3R in Italy!
- **2018**: June 2019
  - Italian Health Ministry
  - Decree Working Group for the promotion of alternative methods to replace the use of animals for scientific purposes
- **2019**: Centro3R in Italy!

**Who are we?**

March 2018: Centro3R was headed by the Universities of Pisa and of Genoa

Today Centro3R boasts some 300 members
March 2018: Centro3R was spearheaded by the Universities of Pisa and of Genoa

Today Centro3R boasts some 300 members from 6 Italian Universities/Polytechnics
**Centro3R’s aims**

**VISION**
To guide the implementation and integration of the 3Rs in scientific curricula and in basic and applied research.

**MISSION**
To promote a scientific, rational and evidence-based approach within the area of humane experimentation in all fields of research.

**STRATEGY**
To share teaching and learning methodologies and resources
MULTIDISCIPLINARY COMPETENCE

BIOLOGY

COMPUTATIONAL MODELS

BIOMATERIALS, BIOREACTORS & BIOFABRICATION

AWBs

PHARMACOLOGY

REGULATIONS LAW / ETHICS

TOXICOLOGY

PATHOLOGY

VETERINARY SCIENCE

SHARING MULTIDISCIPLINARY COMPETENCE

on the website www.centro3r.en

in regular meetings

in Newsletters

on Active social media channels

www.centro3r.it

centro3

#centro3R
**Centro3R’s open source for**

- **Students**: To promote 3R Research
- **Researchers**: To provide tools, methodologies and funding → to satisfy the Best Practice
- **Non-Experts**: To share 3Rs principles

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**Centro3R’s Board**

**DIRECTOR**
- Arti Ahluwalia

**Vice Director**
- Anna Maria Bassi

**Promoter**
- Paolo Milazzo

- **OU UniPisa**: A. Ahluwalia
- **OU UniGenova**: A.M. Bassi
- **OU PolyTorino**: V. Chiono
- **OU PolyMilano**: G.B. Fiore
- **OU UniPavia**: L. Visai
- **OU Milano Bicocca**: G. Cavalletti

**To implement and organize degree courses on the 3Rs and foster the concept of humane research.**
**Centro3R’s Board**

**DIRECTOR**

Arti Ahluwalia

**Vice Director**

Anna Maria Bassi

**Promoter**

Paolo Milazzo

+ 3 Members of each Operative Unit

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**Scientific Teaching Council**

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**Achievements**

- From 2 to 6 universities in 1 year → Over 350 members
- 1 Expert member for the Working Group on Animal Welfare
- Coordination with National Center of Reference on Animal Welfare and PARERE
- Second annual meeting with prizes for Young Scientists
- Restyled WEBSITE with SHARED RESOURCES
Teaching

4 new Courses on Experimental Models Based on 3Rs in degree programs

- Pharmacy
- Biology
- Biomedical Engineering
- Veterinary Science - FELASA accredited
- 1 PhD course

Pending Matters

- Funding
- Adding Good Practice in experimental science and use of 3Rs as a core skill in curricula descriptors
- A chair?
- More universities need to be involved
- Better networking across the EU
Centro3R activities: Talks at Conferences

- ACTC 2018, Cardiff, June 2018
- EUSAAT 2018, Linz, September 2018
- FELASA 2019, Prague, June 2019

and at Courses:

- “In vitro testing in cosmetic and medical device frameworks: update of scientific research”, Bio Basic Europe S.r.l. and University of Pavia, Pavia 2018
- “Introductory Course on Animal Sperimentation” Institute for Pharmacological Research, Mario Negri IRCCS, Milan, December 2018
- Protection of animals used for scientific purposes. Research and innovation within the substitute methods”, Center for lifelong learning and updating of health service personnel, Sicilian Region, Caltanissetta, February 2019

Centro3Rs Training Course and Meeting

2018 Advanced Training Course

2019 2nd Annual Meeting “3Rs in Italian Universities”
Lectures of Centro3R members

- **Arti Ahluwalia** (Uni-Pisa) Towards implementation of the 3Rs in basic research and teaching in Italy: Centro 3R.
- **Daniela Monti** (Uni-Pisa) Reconstructed tissues for ocular research
- **Sonia Scarfi** (Uni-Genova) Silica-induced fibrosis: from early metazoans to human cell co-cultures.
- **Maria Grazia Cascone**, (Uni-Pisa) Setting up of **Scaffolds** for tissue engineering
- **Paolo Milazzo** (Uni-Pisa) In silico approaches for the prediction of chemical toxicity

- **Laura Pastorino** (Uni-Genova) A biomimetic scaffold for 3D functional **neuronal networks**
- **Anna Maria Bassi** (Uni-Genova) Toxicology of the 21st Century: substitutive approaches to animal testing for a **predictive medicine**
Lectures of Specialists and Experts

- Dr. Silvia Letasiova (MatTek In-Vitro) → Development and validation of the EpiDerm in vitro skin irritation protocol for the evaluation of the medical devices extracts
- Jan Markus (MatTek In-Vitro) → EpIntestinal – reconstructed 3D human small intestine model for prediction of gastrointestinal toxicity, drug absorption and more
- Lauri Paasonen (UPM-Kymmene Oyj, Finland) → GrowDex, the natural choice for 3D cell culture applications
- Beatrice Ussia (Euroclone, Milano) → Cell culture monitoring: CytoSMART™ system

- Massimo Di Donato (TebuBio) → Human normal primary cells as in vitro models
- Tommaso Sbrana (IvTech s.r.l.) → Fluidic modules for advanced in-vitro models
- Dr. Costanza Rovida (CAAT-EU) → The integrated project EU-ToxRisk and the case studies for Read-Across approach

Training modules

- The specialists from MatTek, IvTech and UPM offered participants the hands-on possibility to use and perform analysis on proposed models, like Epiderm and EpIntestinal, the Growdex scaffolds, and IvTech Bioreactors.
- Discussion sessions → scientific network on advanced models
Successful feedback from questionnaires:

- excellent level of participant satisfaction
- high level of request for future advanced courses
- enquiries for further information of the Centro3R’s future activities

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019
2nd Annual Meeting
SRs in Italian Universities

June 20-21, 2019
Aula Magna
Palazzo dell’Università di Genova
Via Balbi 5

Support by
Genoa University
- Rector: Paolo Comanducci
- Several Departments of Genoa’s OUs

CONTRIBUTING SPONSORS

EuroClone
testing science through innovation

IVTech

jave

MatTek

PHDGRAPHERS

tebu-bio

UPM BIOFORE BEYOND FOSSILS

VODEN
Welcome address

Arti Ahluwalia, Director of Centro3R, OU UniPisa

Guido Cavalletti
OU Milano Bicocca

Michela Tonetti,
Director of DIMES
OU UniGenoa

Stefano Balleari
Vice Mayor of Genoa

Paolo Comanducci
Rector, University of Genoa

Introductory and welcome remarks

Directive 2010/63/EU – progress, challenges and future directions

Implementation through research, education and communication
**Topic 1**

Involvement of National and International Institutions in 3R Implementation

**Rodolfo Lorenzini**, Director of the Italian Superior Institute of Health

**Ugo Santucci**, General Directorate for Animal Health, Italian Health Ministry

**Lorenzo Fioramonti**, Public Education Ministry

**Adelaide Dura**, JRC

*Three Rs in education and training*

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**Topic 2**

Reduction and Refinement: scientific, ethical and legal issues

**Angelo Gazzano**, OU UniPisa

*Refinement of laboratory animal welfare*

**Michele Panzera**, University of Messina

*Neurophysiological models of animal sentience*

**Franco Manti**, OU UniGenova

*For an ethical experimentation: Moral arguments in support of 3Rs*
**Topic 3**
Companies in Supporting 3R Principles

- Salvatore Simmini, StemCell Technologies
  *Discovering Organoids: The Journey Of 3D Culture Systems*

- Francesco Nevelli, Merck Group
  *Renewing in vitro Potency Assays*

- Nikolas Gaio, BI/OND
  *Versatile Organ-on-chip platforms*

- Alberto Manganaro, Kode Chemoinformatics
  *QSAR models and their practical use, the experience of Kode*

**Topic 4**
In Silico Models: Toxicology & Efficacy of Drugs and Chemicals

- Marco Agostino Deriu, OU PoliTO
  *Computational molecular modelling in rational drug design and discovery*

- Gaetano Valenza, OU UniPisa
  *From statistical uncertainty to machine learning through in-silico models*
### Topic 5
**Application of Reduction and Refinement Principles in Animal Testing**

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>Raffaella Colombo, OU UniPavia</td>
<td>A new in vitro gastrointestinal system to evaluate the effect of exogenous molecules</td>
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<tr>
<td>Luigi Preziosi, OU PoliTo</td>
<td>How can Mathematical Modelling Support Cancer Research</td>
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<tr>
<td>Manuela Marcoli, OU UniGe</td>
<td>Centro 3R Organ and Tissue Sharing Project</td>
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<tr>
<td>Michele Conti, OU UniPavia</td>
<td>Biomechanical simulations and 3D printing for endovascular device testing</td>
</tr>
<tr>
<td>Gianluca Ciardelli, OU PoliTo</td>
<td>On the transferability of tissue engineering technologies to the design of tissue models</td>
</tr>
<tr>
<td>Giovanni Nicoletti, OU UniPavia</td>
<td>Platelet rich plasma enhancement of ex-vivo human skin cultures</td>
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</tbody>
</table>

### Topic 7
**Disease Models Using Human Cells, Tissues and Organs**

<table>
<thead>
<tr>
<th>Speaker</th>
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<tbody>
<tr>
<td>Barbara Parodi, IRCSS San Martino Polyclinic Genoa</td>
<td>Biobanking and biomolecular resource research infrastructure: the Italian node</td>
</tr>
<tr>
<td>Simone Lapi, Biobank of Pisa</td>
<td>Pisa Biobank and Tuscany Regional Biorepository</td>
</tr>
<tr>
<td>Gianfranco Beniamino Fiore, OU PolyMilan</td>
<td>Advanced culture systems for ex-vivo vascular tissue conditioning</td>
</tr>
</tbody>
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**Topic 8**

**Application of Replacement in research**

- **Maria Grazia Cascone, OU UniPisa**
  *Tissue-engineered constructs as animal replacements*

- **Sara Mantero, OU PolyMilan**
  *Bioreactors as physiological-like in vitro models*

- **Paola Petrini, OU PolyMilan**
  *Hydrogel-based platforms to mimic in vivo drug diffusion: a multicenter research*

- **Susi Burgalassi, OU UniPisa**
  *Reconstituted epithelial corneal tissues for evaluation of drug delivery*

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**Topic 9**

**Centro 3R’s Commitment to University training**

- **Arti Ahluwalia, OU UniPisa**
  *Inserting 3Rs in core curricula, hurdles & achievements*

- **Anna Maria Bassi, OU UniGenoa**
  *Teaching and Training in Substitutive Approaches to Animal Testing: Commitment of University of Genova*

- **Valeria Chiono, OU PolyTurin**
  *Approaching 3R teaching in biomedical engineering*

- **Andrea Aliverti, OU PolyMilano**
  *Ethical issues in Ph.D. training at the Polytechnic of Milan*
Round Tables

Abstract and Poster Session Award for young researchers
Ongoing activities

October 31, 2019

Workshop: the 3R principle in a common vision

Coordination between
- Centro 3R
- National Center of Reference
- IPAM
- PARERE
Ongoing activities

Support provided to training activities in EU Project for secondary school students

3R’S LEARNING SCENARIO

Title: SUSTAINABLE SCIENCE: The 3Rs
Author(s) Maela Del Grammastro – Fausto Senia
Summary
This learning scenario leads to the knowledge of the 3R principles, of how these principles have been at the basis of the development of a European legislation on the use of animals in experimental laboratories and how important they are for science in order to focus on the development of alternative methods in respect to using animals in clinical trials.

Ongoing activities

5th Edition
Theoretical and Training Course
LET’S GIVE A MEANING TO SUBSTITUTIVE METHODS TO ANIMAL TESTING
Genoa, March 2020

www.centro3r.lt
How can we reach the final goal of Directive 2010/63EU?

- Reducing the number of animals used in experiments
- Limiting any suffering by animals
- Replacing traditional animal-testing methods with alternative ones with equal or improved validity and translational value

A RESPONSIBLE AND CONSCIOUS APPROACH FOR BIOMEDICAL RESEARCH

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Personal considerations

- Encourage training programs as strategic objective for an updated unspoilt panorama of innovations
- Promote and support the use of non-animal test methods and testing strategies by end-users in the industry, regulators, and academics/students for more reliable results on chemical risks for human and environment
The promotion of 3Rs principles in scientific communities will be challenging task ....!