



## Italian Centro3Rs commitment

### 1 year after the opening of the activities

*Anna Maria Bassi*



A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019



1



**Centro 3R**

**Who we are?**



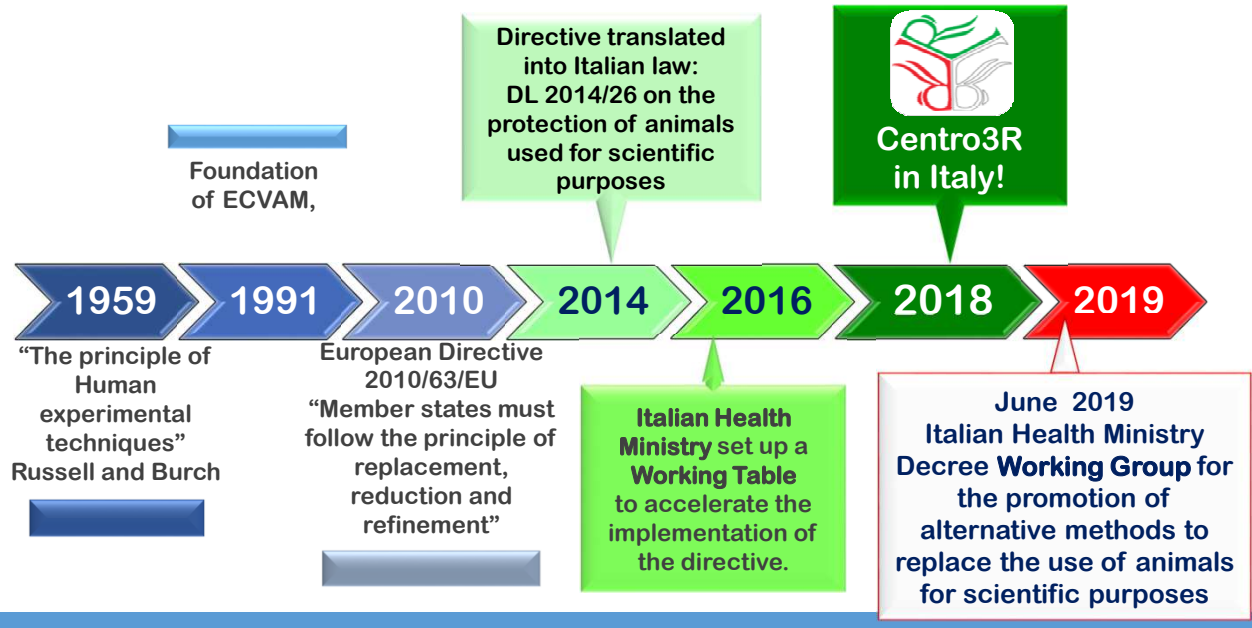
**An Italian not-for-profit platform  
for the promotion of 3R's Principles  
in scientific and teaching environments  
according to the EU Directive 2010/63  
for the protection of animals used  
for scientific means.**

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

2

# 3Rs TIMELINE IN EUROPE & ITALY



## Who are we?



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

Today Centro3R boasts some 300 members



## FOUNDING UNIVERSITIES



**Arti AHLUWALIA**  
**Director**  
Professor of  
Bioengineering at  
University of Pisa



**Anna Maria BASSI**  
**Vice-Director**  
Professor of  
Pathology  
University of Genova



## Who we are?

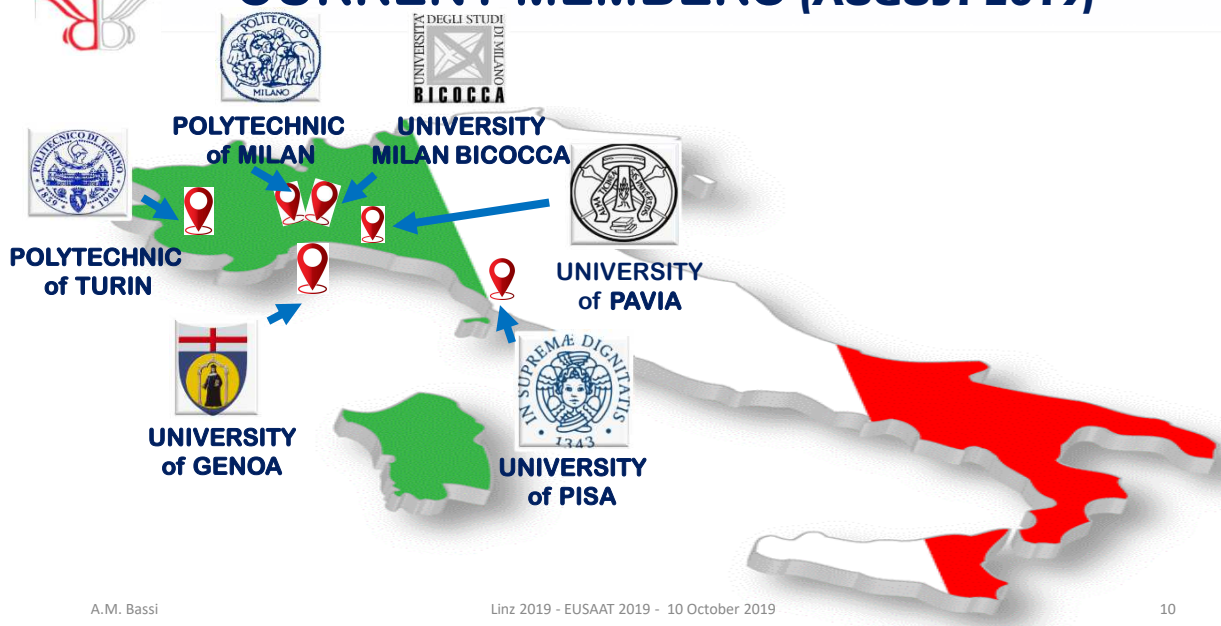


March 2018: Centro3R was spearheaded by the Universities of Pisa and of Genoa

Today Centro3R boasts some 300 members from 6 Italian Universities/Polytechnics



## CURRENT MEMBERS (AUGUST 2019)



A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

10



## 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

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

13





## MULTIDISCIPLINARY COMPETENCE



BIOLOGY



COMPUTATIONAL  
MODELS



BIOMATERIALS,  
BIOREACTORS &  
BIOFABRICATION



AWBs



REGULATIONS  
LAW / ETHICS



TOXICOLOGY



PHARMACOLOGY



PATHOLOGY



VETERINARY  
SCIENCE



## SHARING MULTIDISCIPLINARY COMPETENCE



on the website  
[www.centro3r.en](http://www.centro3r.en)

in Newsletters

in regular  
meetings

on Active social  
media channels

[www.centro3r.it](http://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**



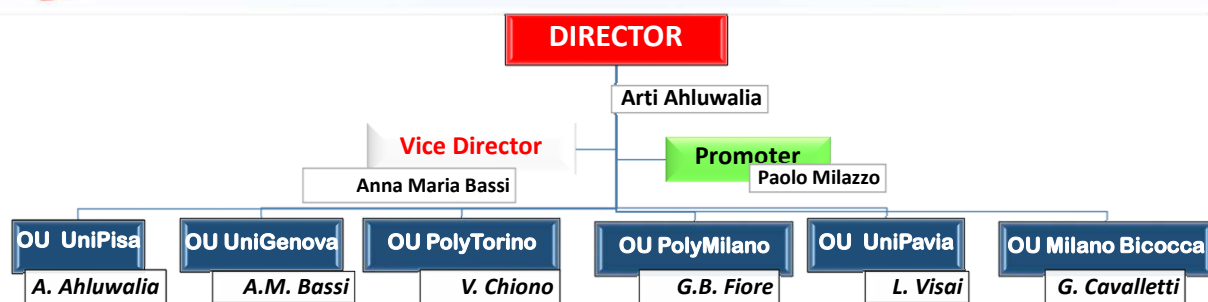
A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

21



## Centro3R's Board



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

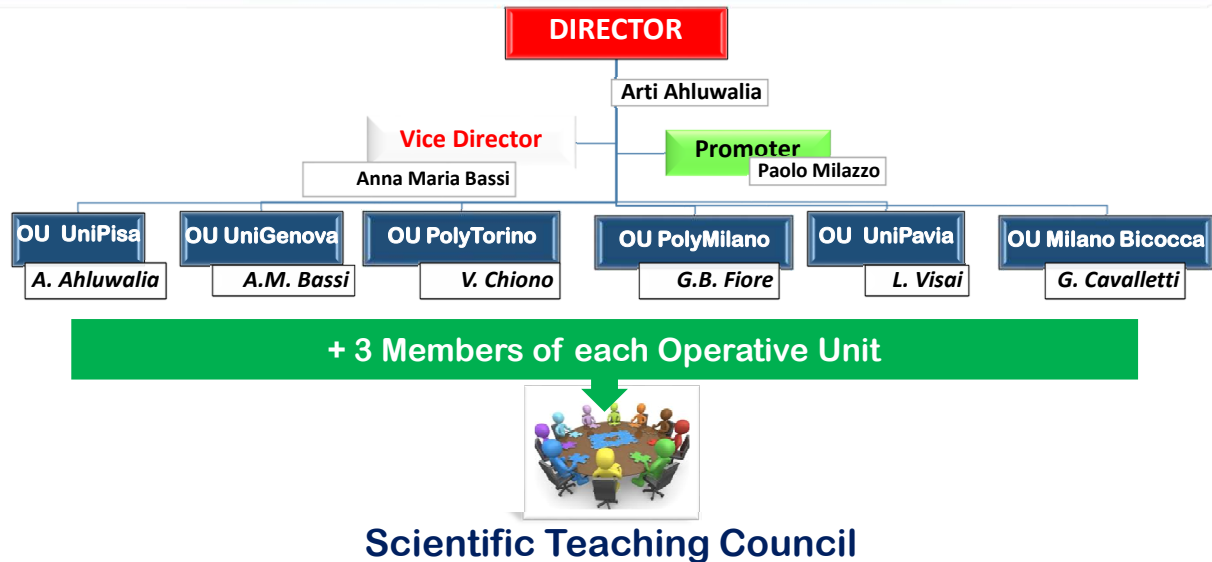
A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

22



## Centro3R's Board



A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

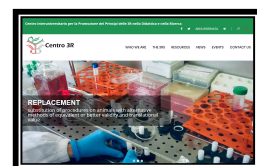
23



## 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



A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

24



## Teaching

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

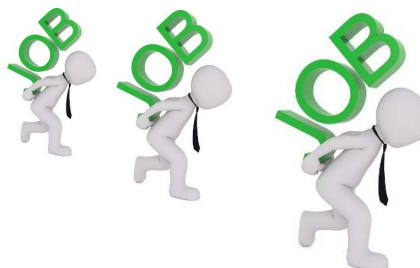
- **Pharmacy**
- **Biology**
- **Biomedical Engineering**
- **Veterinary Science - FELASA accredited**
- **1 PhD course**



## 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”**



## Advanced Course: Genoa, 29-30<sup>th</sup> November 2018

Hosted by  
**LARF-DIMES (University of Genoa)**  
**Centro3R**

**4<sup>th</sup> Edition**  
**Theoretical and Training**  
**Course**  
**LET'S GIVE A MEANING TO**  
**SUBSTITUTIVE METHODS**  
**TO ANIMAL TESTING**



**Updating course**  
**Genoa, 29-30 November 2018**

**20.3 Training Credits (ECM)**  
For the professional profile of Surgeons, Vets,  
Biologists, Chemists, Pharmacists and Biomedical  
Lab Technicians  
A.M. Bassi

**Contributing Sponsor**

**EuroElone**  
serving science through innovation

**IVTech**  
F - 20145 Cinisello B. (MI)  
Via S. Rocco 10  
Tel. 0362 590011  
www.ivtech.it

**The Stofora Company**  
UPM

**MatTek**  
40000  
10000  
10000  
10000

**tebu-bio**

Linz 2019 - EUSAAT 2019 - 10 October 2019

30



## 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 21<sup>st</sup> Century : substitutive approaches to animal testing for a **predictive medicine**

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019





## 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)** EpiIntestinal – 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

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019



- **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

32



## 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 *Epiintestinal*, the *Growdex scaffolds*, and *IvTech Bioreactors*.
- Discussion sessions → scientific network on advanced models



A.M. Bassi



Linz 2019 - EUSAAT 2019 - 10 October 2019

33



## 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

### 2° Annual Meeting 3Rs in Italian Universities



June 20 -21, 2019

Aula Magna  
Palazzo dell'Università di Genova  
Via Balbi 5



UniGenoa



UniPisa



PolyTurin



PolyMilan



UniPavia



UniMilan-Bicocca



110 participants



## 2° Annual Meeting 3Rs in Italian Universities



June 20 -21, 2019

Aula Magna  
Palazzo dell'Università di Genova  
Via Balbi 5



UniGenova



UniPisa



PolyTurin



PolyMilan



UniPavia



UniMilan Bicocca



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



Dibris

Disfor

DISTAV



Linz 2019 - EUSAAT 2019 - 10 October 2019

36

## CONTRIBUTING SPONSORS



**EuroClone**  
serving science through innovation



**IVItech**  
in-vitro technologies



**jove**



**MatTek** | IN VITRO  
LIFE SCIENCE  
LABORATORIES



**PRODOTTI GIANNI**  
the complete, your vision

A.M. Bassi



**tebu-bio**  
Innovative Lab Services & Reagents



**UPM BIOFORE**  
BEYOND FOSSILS

Linz 2019 - EUSAAT 2019 - 10 October 2019



**VODEN**

37



**2° Annual Meeting  
3Rs in Italian  
Universities**

Genoa, June **20-21, 2019**

## Welcome address

**Arti Ahluwalia,**  
Director of Centro3R,  
OU UniPisa



**Guido Cavalletti**  
OU Milano Bicocca

**Anna Maria Bassi,**  
Scientific responsible of Meeting  
OU UniGenoa

**Michela Tonetti,**  
Director of DIMES  
OU UniGenoa

**Stefano Balleari**  
Vice Mayor of  
Genoa

**Paolo Comanducci**  
Rector,  
University of Genoa



**2° Annual Meeting  
3Rs in Italian  
Universities**

Genoa, June **20-21, 2019**

## Keynote Speakers



**Arti Ahluwalia, Director Centro3R – OU UniPisa**

*Introductory and welcome remarks*



**Susanna Louhimies, DG Environment Bruxelles**

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



**Chantra Eskes - Swiss 3R Center**

*Implementation through research, education and communication*



2° Annual Meeting  
3Rs in Italian  
Universities

Genoa, June 20-21, 2019

## 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*



2° Annual Meeting  
3Rs in Italian  
Universities

Genoa, June 20-21, 2019

## 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*



2° Annual Meeting  
3Rs in Italian  
Universities

Genoa, June 20-21, 2019

## 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*

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

42



2° Annual Meeting  
3Rs in Italian  
Universities

Genoa, June 20-21, 2019

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



**Marco Agostino Deriu, OU PoliT**

*Computational molecular modelling in rational drug design and discovery*



**Gaetano Valenza, OU UniPisa**

*From statistical uncertainty to machine learning through in-silico models*

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

43



## Topic 5

### Application of Reduction and Refinement Principles in Animal Testing



**Raffaella Colombo, OU UniPavia**

*A new in vitro gastrointestinal system to evaluate the effect of exogenous molecules*



**Luigi Preziosi, OU PoliTo**

*How can Mathematical Modelling Support Cancer Research*



**Manuela Marcoli, OU UniGe**

*Centro 3R Organ and Tissue Sharing Project*



**Michele Conti, OU UniPavia**

*Biomechanical simulations and 3D printing for endovascular device testing*



**Gianluca Ciardelli, OU PoliTo**

*On the transferability of tissue engineering technologies to the design of tissue models*



**Giovanni Nicoletti, OU UniPavia**

*Platelet rich plasma enhancement of ex-vivo human skin cultures*

## Topic 7

### Disease Models Using Human Cells, Tissues and Organs



**Barbara Parodi, IRCSS San Martino Polyclinic Genoa**

*Biobanking and biomolecular resource research infrastructure: the Italian node*



**Simone Lapi, Biobank of Pisa**

*Pisa Biobank and Tuscany Regional Biorepository*



**Gianfranco Beniamino Fiore, OU PolyMilan**

*Advanced culture systems for ex-vivo vascular tissue conditioning*

## 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 Buralassi, OU UniPisa**

*Reconstituted epithelial corneal tissues for evaluation of drug delivery*

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

46

## Topic 9 Centro 3R's Commitment to University training



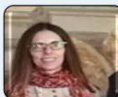
**Arti Ahluwalia, OU UniPisa**

*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*

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

47





## 2° Annual Meeting 3Rs in Italian Universities

Genoa, June 20-21, 2019



## Round Tables



A.M. Bassi



Linz 2019 - EUSAAT 2019 - 10 October 2019



48



## 2° Annual Meeting 3Rs in Italian Universities

Genoa, June 20-21, 2019

## Abstract and Poster Session Award for young researchers



A.M. Bassi



Linz 2019 - EUSAAT 2019 - 10 October 2019



49



## 2° Annual Meeting 3Rs in Italian Universities

Genoa, June 20-21, 2019



<https://www.centro3r.it/en>

### Full Abstracts



A.M. Bassi



Linz 2019 - EUSAAT 2019 - 10 October 2019

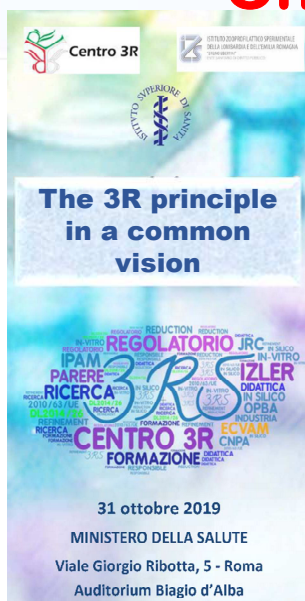
### Report



50



## Ongoing activities



A.M. Bassi

October 31, 2019

Workshop: the 3R principle in a common vision

*Coordination between*

- Centro 3R
- National Center of Reference
- IPAM
- PARERE

Linz 2019 - EUSAAT 2019 - 10 October 2019

51



## Ongoing activities

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

3Rs project



### 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.*

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

52



## Ongoing activities

**5<sup>th</sup> Edition**  
**Theoretical and Training**  
**Course**  
**LET'S GIVE A MEANING**  
**TO SUBSTITUTIVE**  
**METHODS TO ANIMAL**  
**TESTING**



**Genoa, March 2020**



**3 Annual Meeting**  
**3Rs in Italian**  
**Universities**

**Turin, 2020**



[www.centro3r.it](http://www.centro3r.it)



**centro3**

**#centro3R**



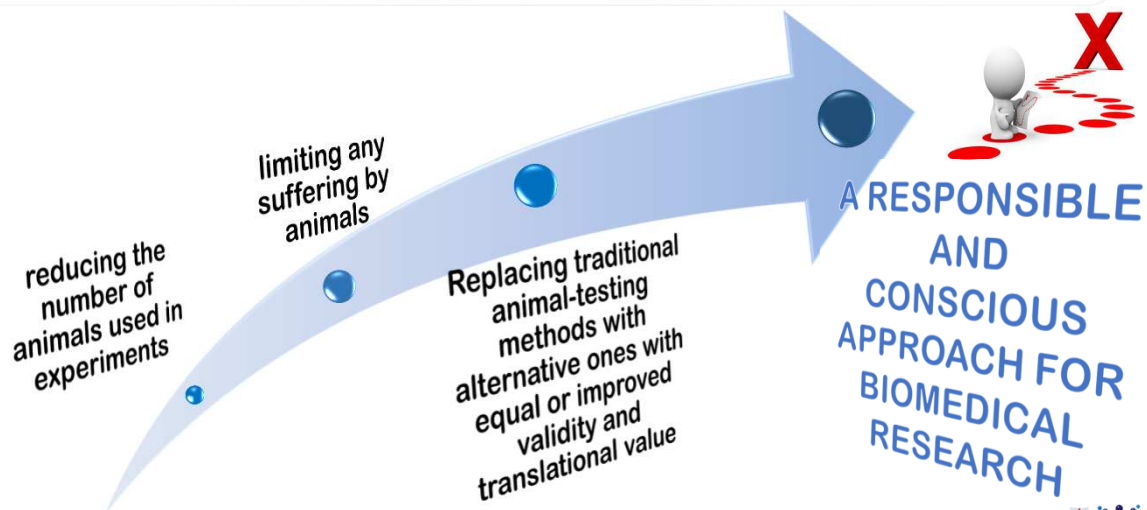
A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

53



## How can we reach the final goal of Directive 2010/63EU ?



A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019



## 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

A.M. Bassi

Linz 2019 - EUSAAT 2019 - 10 October 2019

55



**The promotion of 3Rs principles in scientific communities will be challenging task ....!**



<https://www.centro3r.it/en>



centro3



#centro3R