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How to implement ARRIGE?

Animal Issues

Filipa Ferraz de Oliveira

ARRIGE – Paris March 23rd 2018

Ethics challenges in genome editing technologies



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To CRISPR or Not to CRISPR

The Social Debate on
Genome Editing:



- Entailed intense and passionate ethics discussions
 - ***Great hopes to the improvement of human health***
 - ***Good possibility to the balance of Food Supply***
 - ***New risks to the Environment***

Ethics challenges in genome editing technologies



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Ethics is not a Police force

Instead of:
'what can I do?'

It should be:
'What should I do?'
'How do I do it?'



Ethics challenges in genome editing technologies



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When researching in animals:

- Is genome editing leading to the use of more, or fewer animals in research?
(affecting the cost, efficiency and versatility of research)
- Will the use of CRISPR-Cas9 be consistent with 3Rs principles?
(reduction and refinement)
- Will CRISPR-Cas9 increase the use of genome editing in larger animal models?
(pigs modified for xenotransplantation)

In the Directive 2010/63/EU



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What is already Legislated?

- creation of Genetically Altered (GA) Animals
- breeding of harmful phenotype lines
- genotyping if invasive and not for the purposes of identification
- GA use (as per any live animal use)
- keeping / breeding for scientific purposes to comply with the Directive, including the obligation to apply Refinement (e.g., in breeding, care, accommodation practices)



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In the Directive 2010/63/EU



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Which are the main Issues - the 3Rs?

- establishment of GA line and the related phenotype
- prospective and actual level of severities of GA lines
- sharing of information to downstream users on the phenotype
- methods of genotyping – best practice and refinement from invasive to non-invasive
- methods of creation - efficiencies ; animal numbers; best practice and Refinement
- breeding/maintenance: issue of significant surplus culled annually – space for significant Reduction
- use of cryopreservation as a means to reduce waste
- confusion on when project authorisation required
- confusion over accurate statistical reporting

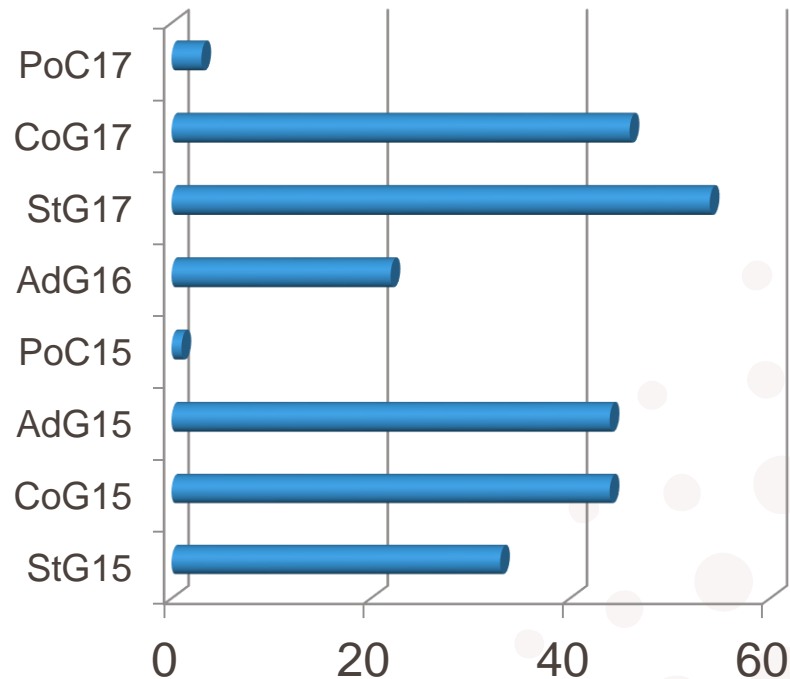
Ethics challenges in genome editing technologies



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CRISPR-Cas9 in ERC research projects – 2 years after

CRISPR-CAS Funded projects in ERCEA



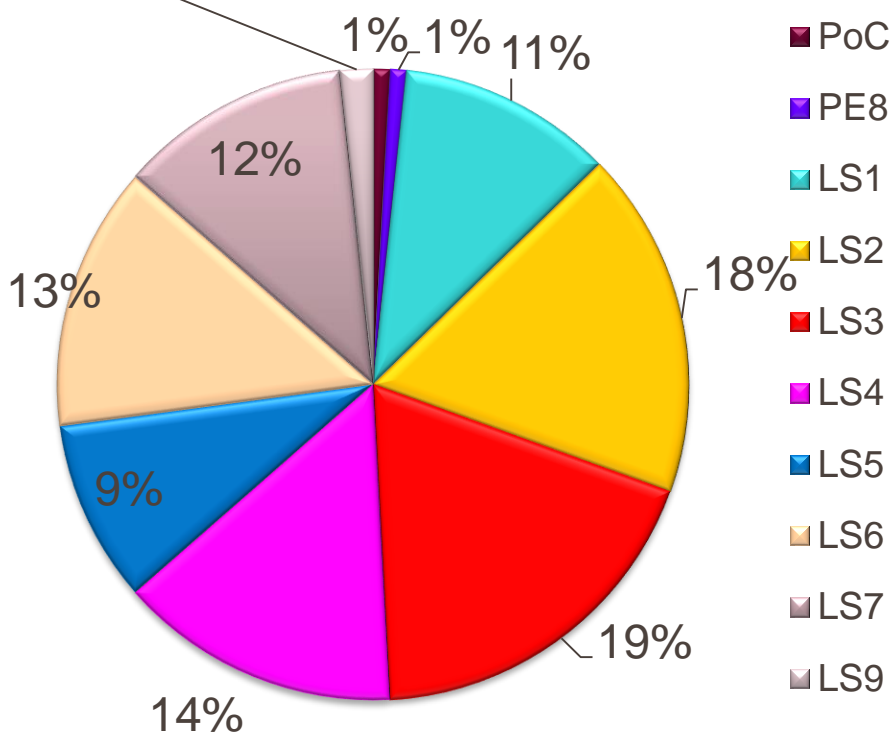
CRISPR-Cas9 in ERC research projects



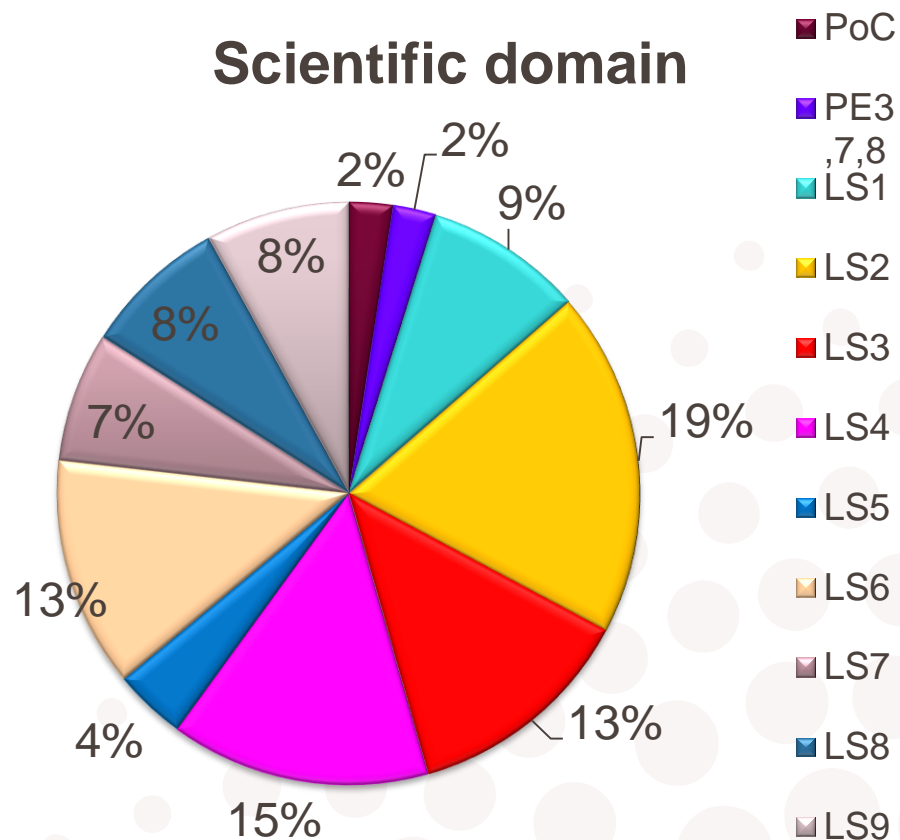
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Scientific domain



Scientific domain



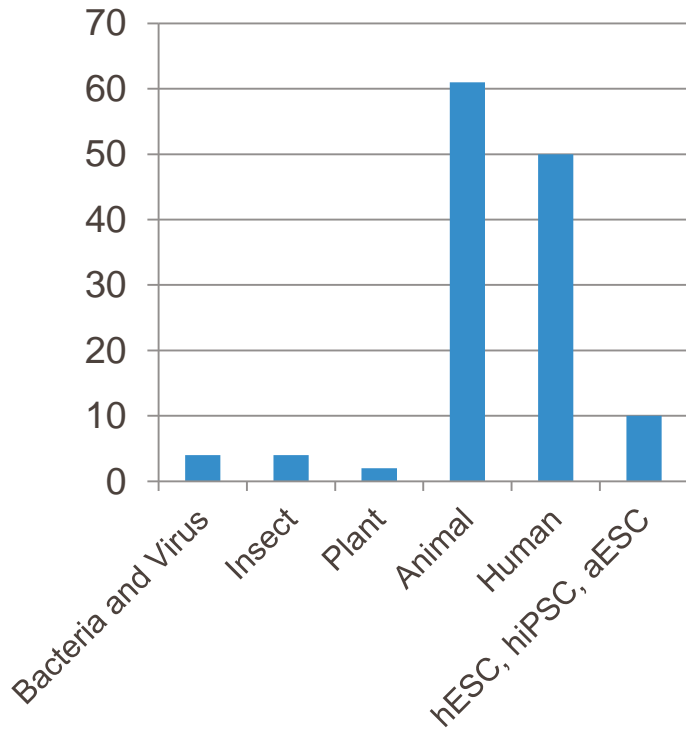
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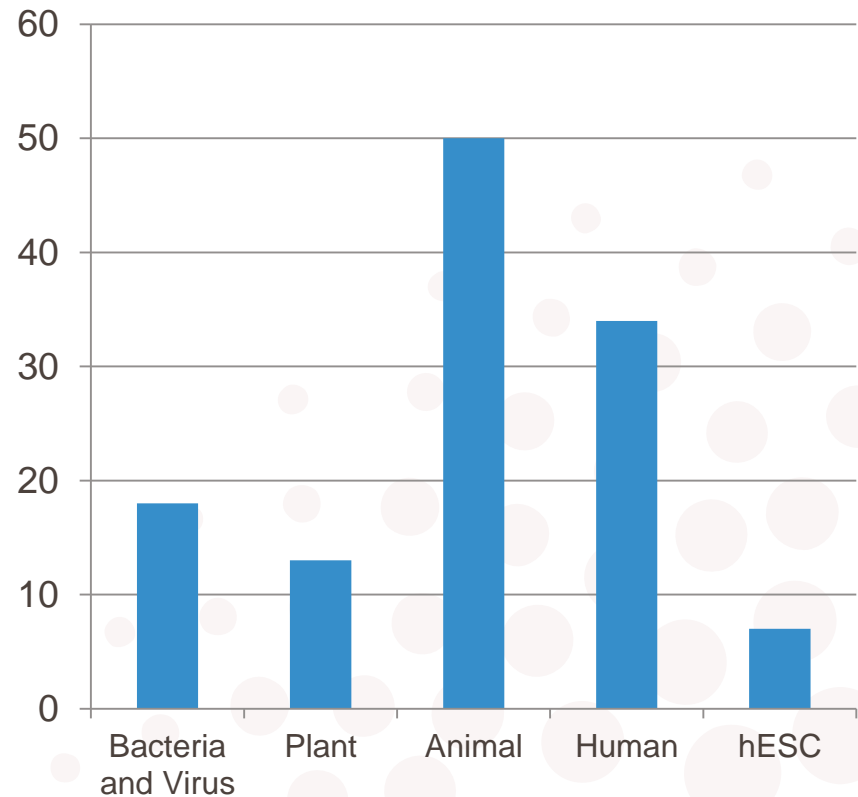
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Type of cell involved



Type of cell involved





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THANK YOU...

QUESTIONS?