



Today's students are tomorrow's researchers

Lisa Andersson¹, Emma Svensk¹, Ebba Jennolf¹, Madeleine Le Grevés^{2,3}, Elin Nyman^{2,4} and Elin Törnqvist^{2,5,6}

1. Swedish 3Rs Center, Swedish Board of Agriculture, Jönköping, Sweden, 2. Swedish National Committee for the Protection of Animals Used for Scientific Purposes, Swedish Board of Agriculture, Jönköping, Sweden, 3. Department of Medical Cell Biology, Uppsala University, Uppsala, Sweden, 4. Department of Biomedical Engineering, Linköping University, Linköping, Sweden, 5. Department of Animal Health and Antimicrobial Strategies, National Veterinary Institute (SVA), Uppsala, Sweden, 6. Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden

The Swedish National Committee and its executive body, the Swedish 3Rs Center, are using several different approaches to reach out to students, both at younger and older ages. Through these initiatives we increase knowledge and understanding of animal experimentation as well as different types of animal-free methods.

Education for the upper secondary school

Together with 3Rs experts and teachers we have produced a web based learning material about research, animal experimentation, ethics, non-animal methods and the 3Rs for the upper secondary school. The material is in Swedish, publicly available and free of charge.

The material consists of three lessons that can be used separately or together. The lessons are largely based on self-education via text, film, images and tasks for individual reflection. The students also get the opportunity to reflect and discuss in groups. The material connects to the upper secondary school curriculum and contains clear instructions to the teacher on how to use it and which subjects it is applicable to. There is also extra material and a teacher's guide attached to each lesson.

Del 1 av 6

Vad är djurförsök?

När djur används i forskning kallas det för djurförsök och djuren kallas försöksdjur. Ofta används djuret som en modell för människan. Det kan till exempel vara vid läkemedelsutveckling. Tester som ska visa om ett visst ämne är giftigt och i grundforskning som undersöker sjukdomar eller andra biologiska processer.

Det kan också handla om veterinärmedicinsk forskning eller forskning på vilda djur, där djuret inte är en modell för människan. Även djur som används i undervisning kan vara försöksdjur.



Del 2 av 6

Cellbaserade metoder

Cellkulturer kan användas inom många olika områden. I grundforskning för att ta reda på hur någonting fungerar inuti cellen och i tillämpad forskning för att ta fram nya läkemedel eller ta reda på om ett särskilt ämne är giftigt för människor, djur eller miljö. Vi kan också odla celler för att producera vaccin eller andra biologiska produkter.

TRADITIONELLA CELLKULTURER	ORGANOIDER	ORGAN-PÅ-CHIP
I traditionella cellkulturer odlar forskaren en typ av celler i ett enkelt lager i en odlingskål. Ett sådant system har givetvis sina begränsningar – cellernas omgivning ser inte ut på samma sätt när celler växer in i en kropp som den gör i en odlingskål.		

Mikroskopering av celler i en traditionell cellodling. Foto: Mukesh Varshney



Writing competition

To generate further interest in the 3Rs, in working with our educational material and to increase the number of subjects where these questions could be discussed, we invited teachers in the upper secondary school to let their students take part in a writing competition.

The theme of the competition was "A world without animal experimentation" and the students were invited to submit short stories or poems. The competition was open during one month and yielded 216 entries. The ten best entries were reviewed by a jury consisting of an author, an expert in popular science communication, a journalist and a researcher. The winning student was granted with 15 000 SEK to the class.



Researchers' week

Every year, the European Commission initiates a science festival, Researchers' Week. In Sweden, this festival is called ForskarFredag and it is coordinated by the non-profit membership organization Public & Science.

During the festival, the 3Rs Center invites teachers from the upper secondary school to digital lessons with researchers. We talk about drug development, risk assessment, chemicals, animal experimentation, non-animal methods and the 3Rs. During the lessons the students listen, ask questions and work individually and in groups.



Education for future animal technicians

During the past years the 3Rs Center has organized digital workshops on stress reduced handling of rats and mice. The workshops contain presentations from the Swedish University of Agricultural Sciences and RISE, Research Institutes of Sweden, and has been given in both Swedish and English for animal technicians, researchers and others with an interest in this topic.

In Sweden, there are a number of courses in the upper secondary school directed towards future animal technicians. Teachers in these courses have requested the 3Rs Center to offer a modified version of the workshop to these students. In the adapted version we included a session on replacement of animal experimentation to give the students a broader view of the 3Rs. We also offered questions to be used for discussions in the class after the workshop.



By exposing students to perspectives on animal experimentation and the 3Rs already at a young age, we aim to foster a non-polarized dialog based on the premises of always choosing the best suited research method available. As often as possible we include all three Rs in our educational activities to broaden the view on research, animal experimentation, non-animal methods and on what the best available method may actually be.