

Biomedical research in the time of covid-19: testimony and reflections of an Erasmus student.

I'm Mario Nappi, a 28 year old Italian Erasmus student. I graduated in Molecular Biology in October 2019 and decided to start my postgraduate Erasmus in Norway in January. I started it at the medical faculty of the University of Oslo, in the research group of prof. Johan F. Storm. I met my supervisor during a lecture and deepened his work while writing my thesis. I therefore decided to start a research internship in this group as I was deeply interested in the research lines they proposed, and I started to carry out experiments aimed at understanding the physiological basis of sleep using mouse models. I was also following the CAREIN course, an animal handling course, aimed at obtaining the FELASA A + B certificate. Following the lockdown caused by Covid-19, which started on March 13 in Norway, I decided to stay in Norway for fear of being able to contract the virus during the trip and to infect my family once I returned also motivated by the hope of being able to resume my research before the end of the Erasmus period.

Many of my colleagues and peers have instead made the choice to return to their country of origin in advance. It has been estimated that around half of Erasmus students have returned to their home country early, and this give us the measure of the impact that lockdown has had on these forms of educational exchange.

To date, due to the lockdown and restrictions of research activities in universities, I have not been able to complete the experimental part of

my work and therefore to obtain adequate results for the study I am conducting. In addition, the CAREIN practical course has been canceled, and the assessment of my written test is still ongoing. In the case of a positive evaluation, I would only be able to obtain the FELASA B certificate.

From my point of view, it was very stressful to face the lockdown phase, as I was deeply depleted of social relationships and I was rightly prevented from continuing my work. This fact, however, initially made me feel that my days had been emptied of meaning. Soon I realized that I had to start spending it significantly, reinventing the way I also spent my time from home.

Due to the obligation of social distancing, many scientists have been forced to stay at home, posing the problem of how they can continue to take care of their animals and carry out their research. In Norway, as in the rest of the world, many laboratory activities involving animals in vivo have been compromised. An article in the journal Nature dealt with this, writing: "Some scientists are able to care for animals in their usual facilities, with animal-care workers taking extra precautions for social distancing. Others have taken animals home or re-released wild-caught specimens. And, sadly, many creatures have been, or will be, killed, particularly small animals such as mice. " (Cull, release or bring them home: Coronavirus crisis forces hard decisions for labs with animals; Nature, March 2020). The article, however, also reports a virtuous case, At the University of Milan, Italy, the activities did not have to undergo a

downsizing due to the imposition of the lockdown as the staff had adapted to work from before by following taking care animals by observing practices consistent with social distances. Despite this, this institute also had to slow down the experimental activity but was not forced to sacrifice animals.

This example suggests how to make animal care practices in animal housing more sustainable in the future. By recommending and implementing practices compatible with social distancing in the animal house offices, it is possible to prevent or mitigate the limitation of animal care activities in the event of new pandemics.

In addition to the social distancing, many laboratories that use techniques in large part of molecular biology have had to suspend their activity due to the lack of availability of PCR reagents, the same reagents that are used in diagnostics to carry out swabs on patients Covid-19 suspects. I consider it right that during the pandemic state all the availability of the reagents is devolved for diagnostic purposes, but I emphasize that this deficiency has cost a lot in this area, forcing these researchers to stop their projects, which have also been invested huge resources, causing both a loss both in terms of economic resources and in terms of potential knowledge.

As for the lessons, as knew, they have moved to digital platforms all over the world. I find it significant, however, to highlight that all those forms of education that do not lend themselves to the "online" mode were severely penalized and impoverished, as no alternative methods were

available during the lockdown to carry out this type of training. I am therefore interested in highlighting the need to develop innovative methods and tools also for “practical” forms of teaching, which are generally carried out in large groups. Many faculties, in particular scientific ones, are dotted with laboratory and training activities of various types, and this type of training is, in my opinion, absolutely essential in the training of the relevant professional figures.

In general I believe that, as is happening, it is right that most activities resume in a broader context of rules that prevent collective viral spread. In fact, I argue that the main lesson we can draw from this experience is the need to implement rules that prevent the spread of Coronavirus infection (or any other pathogen). These rules will help us prevent any further large-scale spread and only in this new context will we be able to continue to carry out the activities previously carried out, obviously, with too little attention.

Only in a context in which prevention has become the norm will it be possible to resume adopting the lifestyle we were previously used to. I believe that, paradoxically, to return to "normal", we'll have to behave differently than before.

This also applies to the Erasmus experience. It is right that the Erasmus experience is also evaluated in the perspective of a potential source of contagion between one country and another and that, as a European project, it is subject to the rules that apply to the movement of people between member countries.

In any case, I personally hope that the work activities in the laboratories will resume with the previous rhythms as soon as possible.

Continuing to work in biomedical research in my country will also be different. As said before, the lack of availability of reagents and the rules of social distancing will cause a slowdown and an impoverishment in the possibility of carrying out and carrying out a research project.