FOSTERING RESPONSIBLE RESEARCH WITH GENOME EDITING TECHNOLOGY: The Need for a Permanent Forum: The Main Goals for ARRIGE.

Recent advances in editing the genome, particularly using CRISPR-Cas9, is unquestionably a technological "revolution" as demonstrated by the rapid expansion of the scientific literature and the continuing emergence of applications and innovative methods, including some potentially safer than CRISPR-Cas9, such as methods editing the RNA or the genome without cutting it.

Considering the huge potential impact on multiple aspects of our societies, from human health to the environment, and the high economic stakes, several Academies and institutional Ethics Committees have already tried to anticipate and address the ethical, legal and social implications (ELSI : the NIH speaks of ELSI https://www.genome.gov/10001618/the-elsi-research-program/) raised by these new technologies. Interestingly, numerous convergences already can be found in the many reports and recommendations published during the last 3 years on the subject, but no process has yet been set-up to clarify how to translate these convergences into actions, and to maintain the continuous analysis of ELSI issues along with new scientific advances and technical applications. All the reports appear to agree on the need to engage all the stakeholders including the general public, but most remains to be done in this area. Therefore, experts in these techniques have a responsibility to the Society in order to devise a regulatory framework and promote the responsible use of genome-editing (GE) technologies.

The present proposal results from several converging initiatives. First, we refer to the reunion of a group of European stakeholders that originally met in Paris in March 2016, wrote some guidelines (including advocating a European Steering Committee) and began a series of joint meetings with African, Latino-American and Indian colleagues. Among shared conclusions were the need to think more ahead when enacting new legislation. It is crucial that we anticipate the next directives these issues are likely to engender rather than react every time, with years of delay, once a technology is out there, already widely used and raising unregulated issues. We should foster a governance risk-management approach, taking into account the many uncertainties. We also converged on the need for inclusive debate on “acceptability and desirability” extending to the civil society and not only limited to safety issues, potential health risks and health benefits. We need transparency to expose what science is doing, what science could do and what science should not do. But we also know that science is not the whole picture and we will have to deal with the race towards the market of some applications, the constraints of some patent fights or the development of the “Do It Yourself” movement.

The aforementioned European initiative is only one among many. We obviously recognize and value the reports produced by high-profile colleagues such as the US National Academy of Sciences or European Academies EASAC. We are also aware of the efforts and requests expressed by patient associations such as EURORDIS. Some of us also participated in OECD initiatives on gathering regulators of genome editing for advanced therapies.

It is now time to join our efforts to team-up and to consider these needs, to call for the building of an international association gathering scientists, research institutions and sponsors, regulators, representatives of the economic sectors potentially impacted by new genome editing tools (health, agriculture, environment..), media, and the general public including patient associations and NGOs.

The goals of this association, which we propose to name “Association for Responsible Research and Innovation in Genome Editing”, ARRIGE, should be to promote a global governance of GE. To do so we first need to ask “What should we steer?”, meaning to define the field of questions that need to be tackled; “How can we steer?”, in other words to define realistic goals to actually assist the process of governance. As an example with safety and security, to provide researchers with framework and guidance in assessing; and finally “Whom should we steer?”, and it should be both the agencies and the public alike. People participating in ARRIGE should provide guidance with the proposal of a toolbox containing specific questions to be addressed. Such a toolbox will be of interest for researchers and regulators, but also for public engagement initiatives and could become a strong reference. ARRIGE should be the place where, on the basis of an open field, open science and open discussion, debates would take place on the basis of what has already been done. As an international association ARRIGE membership should be grounded in the voluntary choice to do so and the engagement and investment of its partners to achieve our goals.

After a one-day meeting in Paris on November 13th 2017, a mailing list was launched (crispr.esc@cnb.csic.es) which rapidly gained over 100 subscriptions of persons world-wide who are interested in our proposal. A web page containing this initial document, our White Paper, the presentations used in our last meeting in Paris and most reports and statements available on the subject can also be found there (http://wwwuser.cnb.csic.es/~montoliu/CRISPR/ethics/).

This now leads us to a call for **a meeting on March 23rd, 2018 in Paris** to set up the structure of **ARRIGE**.

This new association will exist only if you join and bring your expertise, your commitment and expectations about the responsible use of GE.

Consequently, the March 23rd meeting will open a new era: **join us to contribute**.