A clear indication that a development in the life sciences has attracted public attention is when it adorns the cover of one of the world’s leading news magazines. On August 2015, the Economist published an extensive headline report on gene editing with a special focus on CRISPR. The magazine invoked a new “age of the red pen” with the prospect of “editing humanity” and “genetic enhancement”. The Economist is not alone in its enthusiasm: Some observers are even calling CRISPR a “game changer” for genetics research since PCR [1]. If indeed it is a “game”, it began with the publication of CRISPR/Cas experiments on non-viable human embryos, which raised the very real prospect of germ line modification [2], and it has evoked strong and unforeseeable responses from the public. The stakes were further raised with a call from various scientists for a moratorium on CRISPR/Cas editing of germ line cells, leading to the International Summit on Human Gene Editing in Washington, DC, USA, in December 2015.

But what exactly is the game about? The story about CRISPR/Cas is not primarily a scientific competition about the best methods or the most promising approaches to editing genomes. In fact, as with other emerging biotechnologies, the debate on gene editing is located at the interface between science, technology, and society [3]. This has important implications for the focus, conduct, and possible outcomes of the discussion. First, it means that gene editing technologies, similar to other emerging biotechnologies, offer tremendous potential to generate new ideas, methods, and—in the long run—applications to meet urgent societal challenges and needs. Second, these techniques are perceived as having the potential to challenge and sometimes blur attitudes, social values, and cultural beliefs. Third, there is a complex—more implicit than explicit—negotiation process between science and society taking place regarding which technique should be developed and used and for which reason this should or could be done.

The current debate on gene editing could perhaps be understood as a wager between science and society: One side—mostly scientists—is trying to guess and cater for the possible reaction of the other side, while the other side—mostly the public—is trying to discern the underlying intentions and goals of the other. In the aftermath of the Chinese publication on editing human embryos, it were scientists who laid the wager, arguing that it would be necessary to ban the use of CRISPR for modifying the human germ line [4,5]. However, the wager itself perhaps missed the wider point. The question to answer is not whether or not we need a moratorium on CRISPR/Cas and on which kind of cells; rather, it is about how to shape and conduct a democratic debate and find a broad consensus about the general aims of research. Accordingly, the wager about the scope of the general aims of gene editing is canvassed within two major issues.

First, it is not very clear which kind of cells—both “natural” cells, but also “artificial” cells such as induced pluripotent stem cells—should be regarded as somatic and which as germ line cells. At this point, it becomes clear that current technologies blur the previously strict dichotomy of somatic and germ line cells, as somatic cells can be reprogrammed into pluripotent stem cells and further into gametes [6]. This does not necessarily mean that maintaining these categories is completely nonsensical. But the important point to consider is to which cells any ban or strict regulation of gene editing using CRISPR or related technologies should apply: embryonic cells, gametes, pluripotent stem cells, iPSC-derived gamete cells? If we were to honestly admit that there is no strict separation between somatic and germ line cells, we could start thinking about alternative approaches to tackle the underlying problem—which is to prevent the inheritance of edited genes by future descendants—such as developing technologies and methods that inhibit the transfer of a genetic modification to offspring. This would also be in line with the recommendation by Article 13 of the so-called Oviedo Convention—the only international, legally binding instrument that addresses human rights in biomedicine [7].

Second, we are currently discussing CRISPR from an unpromising perspective because the strict focus on which kind of cells should or should not be edited is not a viable strategy. Instead, the debate needs to be embedded into a larger societal context. Different surveys in the USA and the EU show that the public does not worry too much about particular technologies or scientific advances, but instead pays attention to the general goals of science and any of its applications. This public attitude could be interpreted as a granted loan of trust, since citizens are aware that research pursues long-term goals and that its impacts may go much further than could be foreseen at the moment. This loan is granted because citizens, who are aware that they have little
influence on scientific and technological developments, instead require technical, legal, and political control mechanisms to prevent abuse and reduce the risk of unforeseeable damaging consequences. Beyond any possible public support for gene editing of human embryos in order to develop new therapeutics, there is nonetheless some kind of diffuse discontent and unease about crossing an ethical line into germ line modification [8]. This is not because such cells are seen as something miraculous or some kind of a holy grail, but because the crossing of a symbolic line is interpreted in the sense that germ line modification highlights the ambiguity of becoming something or giving something the opportunity to become something in a specific manner. In other words, the question of applying CRISPR is therefore more a political and cultural one than a question of technical difficulty [9].

Something interesting is talking place as a consequence of this public unease: The call for a moratorium has evoked a public debate about the accession to gene editing in general. Returning to the metaphor of the wager, the moratorium has raised the stakes at win all or loose everything. At risk is that a new and powerful technology will have great difficulty finding public acceptance if a critical part of the public respond with a call for a broad ban on gene editing in general. Yet, such a “call all hands” approach also creates an opportunity of cooling down a currently heated debate, and of diminishing the stakes in the wager. Instead of rehashing this risky game with every new technology, the current debate about CRISPR can trigger a more general discussion about how to build a sustainable frame for responsible research within emerging biotechnologies.

The statement of the International Summit on Human Gene Editing in December 2015 could be interpreted as a backtrack from the initial high-stakes wager. Unlike the original call for a moratorium in March, it no longer maintains a need for a ban but proposes to “reach a broad societal consensus about the appropriateness of the proposed application” [10]. Of course such a statement cannot call off the wager. But it might help to cool down the heated debate to rationally discuss the actual aims that society and science would like to pursue by using gene editing and re-entangle the various issues involved in the debate. Bearing the Oviedo Convention in mind could be very helpful in this regard: The important issue is not whether a scientist is working with somatic or germ line cells but the aim which he or she is pursuing. Any regulation of gene editing techniques would then depend on the respective context and aim, not solely on the presumed ontology of the cell or tissue.

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References

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