VALÈNCIA DEBATE (Spain) 12/09/2012
CULTURAL CENTRE

1) Is synthetic biology a safe tool to deal with future challenges of an ageing population?

- There must be a huge previous work before launching this kind of device to the public in terms of knowing which is the concrete microorganism that could analyze the medicine in the blood and it must be highly known as non-pathogenic one.

- Looks like one of the problems shown there (in the movie) is the isolation of the old people, and I have had the feeling this technologies could boost the loneliness and isolation instead of solve it, so, it may be more useful to apply it to people who must be in quarantine due to a contagious infection or into a deep coma. In those cases, telecaring technologies (like the one in the movie) could be a solution.

- Synthetic Biology applied to the health is always risky. We cannot predict which is the behavior the bacteria are going to acquire, we cannot deal with live cultures; life goes and it is impossible to have the control over all the organisms. I won't trust in this kind of tools.

- The main problem would be to build good sensors to detect the drug into the blood.

- We must trust in statistics, as well as we trust in cars and there's a percentage of risk that might make them defective, we can trust in this kind of technology, I would.

- But cars as engineered systems aren't changing in the adaptive way, which is the clue that you need to be aware of trusting in biological systems.

2) Open source / Monopolies on life

- I disagree with open source in this context because it could bring such kind of situations were people recreate by themselves the device but it should not be seen as the opposition of monopolies of companies; I disagree as well with monopolies; the perfect situation would be when several companies are competing among them so they try to make it better. Maybe there would be necessary a control by an external organization, but it is true it doesn't mean it would be deprive of any interest.

- I don't think monopolies could be the solution to control the risks, there should be some mechanisms of control from outside and collaborations; a good solution would be half way between the patent and the absolute deregulation; regulation by quality controls and security, and overall, the regulation which must come from the scientific community. In the same way that it isn't necessary that a patent guarantees security, neither is the government; it is just necessary good communication and collaboration politics which would establish controls, and these could be the own users, knowing and being able to

understand what are they manipulating. Statistically, even if dealing with potentially changing systems, a close monopolist system would not be more trustful than an open one if risks are understood.

- In the analogy with free software we must think that people who are doing it really know how to work with computers, but here what you would just see is a watch and behind it there's a whole biological world which people would be unaware of.

- There's a lack of education in that context which should be mitigated if we want to use open source; the society as a whole might not be ready.

- The same is happening with new medicines; when they are launched and something goes wrong the company goes bankrupt, and it wouldn't happen if the product could be reached by everybody, but I understand that if companies regulate the use of it the safety would be improved.

- I don't understand why are you associating the open source concept with hacking.

- We aren't really doing it, we suggest that due to monopolies exist, hacking is produced, and thus the necessity of the open source system; if there weren't monopolies, maybe hacking wouldn't be a problem.

3) <u>Communication with mutated bacteria</u>

- We could simply trust in the programmed license, as it works in the film, but we know the company has arranged a statistical average period to say the cultures are ran out of date and as mutations are unpredictable, that fixed date doesn't make sense.

- It could be feasible if the device itself would let you know when the bacteria have lost the ability of detecting the character they are looking for, and that would be when the license expires. Despite being very hard to detect which is the mutation that makes the culture not answer properly, but, if this was possible, the license would be the indicator of that concrete mutation.

- An easier way to know if the device is working properly would be making a blank, asking the culture without giving blood to it to ensure it's working well and we can trust on it.

- People don't care what are they taking if it is curing them.

- But when talking about transgenic organisms the perspective changes and people don't trust them even if they have been the most tested systems when they are launched to the public. Even if they are quite young it isn't true there aren't good security controls about them. There does exist natural toxic products which aren't studied but the artificial ones are, but of course, there's not an ensurable zero risk from them. Technologies aren't good or bad, it always depends on the role they have and if they work or not. So far, the number

of deaths by transgenic food ingested is zero.

- I think when giving transgenic products to the public, a good assessment and enough information must be supplied, with common medication as well, but overall with transgenic products because we can't be completely sure there aren't risks just because now they haven't appeared yet.

- In terms of environmental risk, transgenic crops have produced much less damage to the environment than natural crops. And, people aren't afraid of transgenic products dealing with health, but those which are ingested. Most of the vaccines are made with transgenic organisms and people don't hesitate to use them. Fear of transgenic products just comes from the ones that are eaten.

- The point is not if the product is reliable or not, but if it is suitable or isn't. In the case of the film we should think in survival probabilities; if the probability of the old man to survive using that device is higher than the probability of not surviving without using it, it is suitable and should be launched to the society. In this context, we must trust in statistical numbers.

- These devices aren't machines, they aren't fixed. Making the analogy with the science fiction film Jurassic Park, where they managed to make female dinosaurs, and due to a small unpredictable change, some males appeared and started to reproduce among them; it comes to my mind the quote “Life goes in its way”, and we cannot control it. Synthetic biology deals with evolutionary life, and we must be aware of this. Maybe enlarging the life of the people should bring new problems as excess of population.

- Every technology launched to the market has that duality, it is not just synthetic biology that can be used in the wrong way.

- Science always can be used in the wrong way but that doesn't mean we should stop researching, that just mean bioethical organizations must also play their role.

- We are talking about science related to the health, it needs to be researched, new diseases appear constantly and we need to deal with them, we cannot stop because the tools we create might be used in the wrong way.

- Scientists create the tools and then companies use them for some purpose, but if that purpose isn't good, it doesn't mean scientists aren't guilty, because they have the first responsibilities as they are the ones who are able to create them. With all power comes responsibility.

ANALYSES

1) Is synthetic biology a safe tool to deal with the future challenges of an aging population?

– There must always be a large previous study before a synthetic biology tool comes out to society; statistics have an important role advising the likely potential risks and we need to take care that biological systems are always evolving and unpredictable risk can appear; moreover, aside consequences would arise in telecaring assessment due to instead of solving the isolation of the population aging it might increase it, but might be useful to deal other challenges like contagious infections in which telecaring could be beneficial.

2) Open source / Monopolies on life

- A good bunch of information about how the device works is always necessary when we refer to a new product. Monopolies and patents will look after themselves, and science should go away from them, but good controls are indispensable. Half way between patents and absolute deregulation would be the solution. Hackerism is produced because monopolies exist, and thus the potential solution would be an open source system among highly informed users.

3) Communication with mutated bacteria

- As mutation range is unpredictable the device should not have a fixed date established by the company to renew it. But if it was renewed once the device could let us know by itself that some mutation has taken place. Then we could trust in a good communication with the product without the risk of dealing with lying bacteria. Science has always the potential to create good and bad tool applications and thus, apart from bioethical committees, scientists always deal with responsibilities.

COMMENTS

Mostly all the people who came to this debate had a scientific background and it has been reflected in the way they have driven the discussion. What is curious to see is how most of the opinions came to a consensus as the debate was going on.