



## PANELISTS DEBATE

### **John ANDREWS, Contributing Editor, *The Economist***

Let me get onto this question of ethics. You are making such advances in science and medicine. At some point, there must already be ethical boundaries. If I put it in a journalistic way, are you worried about designer babies, Dr Bréchet? This almost gets into the realm of eugenics.

### **Christian BRÉCHOT, President of the Institut Pasteur, France**

There are really several tiers to be considered. Yes, we are very worried, and I believe that we should be worried. As soon as you start, again, you have for example technologies such as the famous CRISPR Cas technology, which is very popular. You have the possibility to have reprogramming of embryonic cells. These pose some fundamental questions that we must address, and that is one point.

However, regarding what I presented, we already have a major concern and for me, this is a key issue. How are we going to secure all this data and the access to this data? This is a general question, obviously, which is nothing new or special to the Pasteur Institute or to other institutes. However, we now have easier ways to generate this data and to transmit this data, and we know that we must transmit this data.

I believe that we have to sit with several parts of society and decide how we want to determine for example whether some data should remain the property of individuals. Some data might be the property of the state. Some data might be shared. Now the good point is that my understanding, although I am not an expert, is that you have technologies which should allow us to do so. This is a general answer, because I believe that we are at the dawn of this, but it is a very important concern.

### **John ANDREWS, Contributing Editor, *The Economist***

Let me put almost the same question to Sheik Mohammed. In Britain, for example, there is quite a serious body to deal with ethical issues on medicine, especially medical research. I cannot remember the name of it. I wonder if Qatar has the same thing.

### **Sheikh Dr. Mohammed BIN HAMAD AL-THANI, Director of Public Health, Ministry of Public Health, Qatar**

In the State of Qatar, we are aware of ethical and legal issues that arise in the practice of medicine and biomedical research. The Ministry of Public Health (MOPH) has developed a systematic model to govern the ethical conduct of research in Qatar through the establishment of the Human Health Research Department. We have successfully developed the Qatar National Research Ethics Committee. We have also developed a system for Institutional Review Board registration at each research center, where we look into committee members' qualifications, ensuring they are highly educated, and have the appropriate research ethics training. The key ethical issues are those involved in obtaining informed consent from patients and research subjects, the moral dimensions of organ donation and transplantation, the ethics and laws relating to stem cell research, confidentiality, and Islamic perspectives of medical ethics. These issues present new ethical dilemmas, which require a robust legal framework to protect patients, practitioners and communities. The Qatar National Research Ethics Committee at the Ministry of Public Health offers a set of guidelines that assist investigators and Institutional Review Boards in the design and conduct of genomic research to ensure the safety and well-being of participants.

**John ANDREWS, Contributing Editor, *The Economist***

Madame Zhu, I have the same question. The genome is no longer a mystery. Now, you were talking about the Internet of life. Where do we go eventually? If you are going faster than Moore's Law, we are really into absolutely unknown territory, which may or may not be terrifying. It may be wonderful.

**Yan-Mei ZHU, Executive Vice-President of the Beijing Genomics Institute**

Every kind of technology is a double-sided war, but the human genome project started to digitalise life. It translated the ATCG to 1010, so life is digital. 20 years ago, nobody believed that, but now, it is time. I would like to give a comment to you regarding gene editing. This year, there was a case of children in the United States, which were completely cured of sarcoemia with gene editing. We are talking about ethics, but I think ethics is a kind of product relationship. You decide productivity.

I think some years ago, marriage could not happen outside one tribe, but now it is forbidden to marry within three generations. That is a good example where ethics need to be changed. I think it is a good time, because health and longevity is everybody's dream. We love innovation, but innovation for what? I think it is time to ward off diseases, reduce diseases and collaborate with Qatar and other Middle Eastern countries. I believe it and I think it is much better than industrial time.

**John ANDREWS, Contributing Editor, *The Economist***

Dr Bréchet, you used the phrase 'personalised medicine'. Does that not mean that in the end, the wealthy will get the medicine that they need and the poor will not? This is because of the pharmaceutical companies. If the medicine is personalised, then presumably the market will be smaller and therefore the price will be higher.

**Christian BRÉCHOT, President of the Institut Pasteur, France**

This is also an interesting question. I am not so sure about this. Before taking the position as president of the Pasteur Institute, I was vice-president of a company involved in *in vitro* diagnostics. We had this discussion regarding diagnostics and pharma. In principle, pharma would not like to reduce the market, because you decrease the number of patients eligible to receive the drugs. It is true that there then might be a tendency to have an increase in the price.

However, on the other hand, you target those patients who need the drug. There is a very important point when you speak of precision medicine, which is also to determine those who will have side effects. On balance, you really have to take into account all the results. That is my first answer to the question. It is not only about determining the efficacy, but also tolerance. This is worth taking into account by the health systems, regarding the cost.

The second point is about progress in point of care, in good diagnostic tests. The capacity to have communication everywhere in the world about the results will allow many more patients to benefit from this personalised medicine. For me, the main problem with precision medicine or personalised medicine or whatever is the quality of the results which are generated. When you have the Beijing Genome Institute, you know you have reproducible results. However, we will have a worldwide bulk of information and if that is not correct, then you arrive at precision medicine which is totally imprecise.

**John ANDREWS, Contributing Editor, *The Economist***

I am going to ask one last question, for Sheikh Mohammed and for all of you. We talk here of governance, and the implication is that this is collaboration between states on a global level. However, if you look at the headlines, then I

think one might argue about who is the most effective body in medicine for the masses at the moment. These are perhaps the Bill Gates Foundation or the Clinton Global Initiative. Is this a failure of governments that the space is actually being taken by private individuals?

**Sheikh Mohammed BIN HAMAD AL-THANI, Director of Public Health, Ministry of Public Health, Qatar**

One of the aims of the private Bill & Melinda Gates Foundation, launched on 2000, is to enhance healthcare in the world with a budget exceeding USD 50 billion. The Foundation is working closely with a new international coalition called the Global Alliance for Vaccines and Immunization (GAVI) which includes the World Health Organization WHO. The Children's Vaccine Program uses the money for a sustained global vaccination effort to address the challenges facing vaccine development and delivery in developing countries. We hope the Foundation extends the collaboration with WHO to other global healthcare sectors.

The Clinton Health Access Initiative (CHAI) is a separate non-profit organization from the Clinton Foundation which is a non-profit organization founded on 1997. The CHAI focuses on saving lives of millions of people living with HIV/AIDS in the developing world. The main problem is that they do not consider other global health areas and there is no effort to collaborate with WHO.

WHO works with all Member States to support their national health development processes. It promotes the achievement of the highest sustainable level of health of all people. A Health Assembly is held annually in Geneva, in Switzerland, to set policy and approve budgets and programs of work. The budget of the WHO is about USD 4 billion (less than 10% of the budget of Bill & Melinda Gates Foundation). The moment we believe that success requires combining effort between private sector and governmental sector, smart planning, and transparent governance, we will achieve our common global goals.

**John ANDREWS, Contributing Editor, *The Economist***

That is fascinating. Do you agree, Dr Bréchet and Madame Zhu?

**Christian BRÉCHOT, President of the Institut Pasteur, France**

I agree. Bill and Melinda Gates are extraordinary people, when you have discussions with them. They have done a fantastic job and we have to recognise this. However, on principle, if we speak of governance, this is a problem.

**Yan-Mei ZHU, Executive Vice-President of the Beijing Genomics Institute**

Genes are the code of life, the language of life, but regarding nature, maybe God gave us the language, so we should use that. That is my dream.