

Presentation

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In 2002, a debate took place in Catalonia as to whether we should change our research system. I participated in the European Parliamentary Technology Assessment (EPTA) conference held in Switzerland, where the Catalan branch was invited to become a member. At the time, we did not have a parliamentary assessment commission. It was only then that we learned about its importance in advising members of Parliament on all research-related laws discussed on a regular basis.

Thus, the Advisory Board of the Parliament of Catalonia for Science and Technology (CAPCIT), the Catalan branch of EPTA, was founded in 2008. CAPCIT is an example of the differences in the Catalan model for technology transfer. We strongly believe that we will only be able to emerge from the economic crisis in our country if we invest in a knowledge-based economy—one of the cornerstones of which is high-quality research. Of course, this is not the only criterion, but it is an absolutely necessary one. That is why, about 15 years ago, we implemented a new research policy in Catalonia. Its three basic guidelines are as follows: First of all, strong instruments must be put in place to attract and retain both talent and an open system of research. The best example of this is the Catalan Institution for Research and Advanced Studies (ICREA), created in response to the need to

seek new hiring formulas competitive with those of other research systems and to recruit to the Catalan R&D system top scientists capable of leading new research groups, strengthening existing ones and establishing new lines of research. Second, the country profits from a large-scale infrastructure for organizing science, consisting of a system of public, autonomous research centres. Third, this large-scale system must be at the disposal of our research community.

We think that the results over the past 15 years have been very good for a small country, such as ours: Catalonia contributes 1.5 % of the population of Europe and produces 3 % of Europe's total scientific production. We also attract 2 % of the 7th Framework Programme funds, and in terms of ERC grants per million inhabitants, Catalonia is third in the European Union (if Israel and Switzerland are included in an expanded list, Catalonia is 5th in the ranking). But having attained a high level of research, the Catalan system faces the enormous challenge of converting this knowledge to economic gain. In this debate, of course, the Government plays a role, but so does Parliament. Thus, working with CAPCIT, the Parliament needs to define the path to be taken by Catalonian research in a knowledge-based economy.

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Genomic technologies have the potential to transform the delivery of healthcare in Europe: (i) by providing vital insights that support the more accurate diagnosis of diseases and (ii) by informing therapeutic decisions, so that more patients receive the right treatment at the right time [1]. These two aims go hand in hand with preventive care, by extending our understanding of the risk of disease and helping us to quickly control new outbreaks of infectious diseases.

Preventive care is implicitly linked to prognosis and prediction. But, as a matter of fact, the challenge of improving outcomes through prognostic and predictive information is not new one in medicine. Indeed, it can be traced back to, at least, Hippocratic times. What has changed in the last few years, however, is the strength of our expectations from this accumu-

lated information. Until recently, it was assumed that we could identify prognostic factors for 'subgroups' of patients that would explain their different prognoses, while also recognizing common characteristics. Today, our expectations have been raised, and accurate prognostic judgments are expected on an 'individual patient' basis [2].

Personalized medicine is the term used to herald this incipient prognostic transformation of biomedicine. It refers to healthcare guided by detailed prognostic and predictive information that is formulated for each patient. Nonetheless, some scientists would argue that the era of personalized medicine has not yet arrived; instead we are only in an era of stratified medicine, because mainly what we are able to predict is the risk for a patient subgroup.

Of greater concern is that the benefits of biomedical science and clinical and public health research have not been made available to everyone. Personalized or stratified, if you will, medicine will essentially allow those in rich countries to create individually tailored drug regimens and behavioural modifications for overcoming predicted individual diseases risks, thus creating a new field of 'boutique medicine,' as Barry Bloom wrote in *Nature* more than a decade ago [3]. Yet, much of the knowledge derived from biomedical science and the resources to obtain boutique treatment and prevention to overcome these risks will simply not be available to 85 % of the world's population, i.e. the developing world. The benefits conferred by personalized medicine, together with considerations regarding sustainability, bioethics, social responsibilities, and the challenges or limits to forecasting in personal-

ized medicine were the topics discussed at the 2012 Annual EPTA Meeting in Barcelona, "From Genes to Jeans: Challenges on the Road to Personalised Medicine."

References

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