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CHAPTER 1

# Prologue

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**I**t is an honour and a pleasure for me to be asked to write a few lines about the theme of this book. I was lucky enough to take part in the meetings held on 1-3 December 2004 under the heading "Third Future Trends Forum Meeting", and to hear the excellent papers and discussions which, as you can appreciate yourself from this book, were of such great importance and significance. I would go so far as to say that the Fundación de la Innovación Bankinter has taken a bold and pioneering step in holding a meeting on a theme whose social and economic repercussions will only be seen in the future—albeit the immediate future—such as personalized medicine.

It is well known that a pharmaceutical product may often be highly beneficial for most users, but sometimes prove not to be of utility for a certain number of consumers. This apparent riddle has now been solved by the giant steps that have been taken in genetics, particularly the Human Genome Project, which has clearly established the great similarity between all the inhabitants of this planet while at the same time showing that no two people are exactly the same. For this reason, pharmacogenomics—the study of the individual response to pharmaceuticals—is of key interest.

It costs approximately one billion dollars to develop a new pharmaceutical product, since it requires intensive study of the pharmacokinetics, pharmacodynamics and multiple interactions, and calls for participation by as large as possible a number of subjects. None of this, however, can prevent the possible appearance of problems when the drug is administered to a specific patient, with resulting economic losses. As a result, we are in increasing need of a system of personalized medicine. The idea might seem like the stuff of science-fiction, but happily this is not the case: technology advances in leaps and bounds and it is expected that it will soon be possible to determine the genome sequence of any individual for less than €1000. Perhaps by the time this book is published, that will already be the case.

Naturally this type of technology, and for example the possibility pointed to recently in the work of three different American universities, of quickly identifying the "SNPs" (single nucleotide polymorphisms) in a genome simply and effectively, will be of great help to us in understanding individual responses to treatments with pharmaceuticals. Naturally, personalized medicine will also create many social problems which we must address, related to insurance and more importantly, to the ethical problems raised by genetic knowledge at an individual level. Nonetheless, the benefits will be greater than these problems and they will ultimately be solved.

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