Tekst 5

Is the biotechnology revolution a myth?

by Robert Matthews

1 You might think these are revolutionary times for medical science. Now that the human genetic blueprint has been decoded, wonder cures for lots of diseases are coming on stream. Even genetic diseases have become treatable. That, at least, is the impression created by years of upbeat media coverage. But the reality is very different. Far from "decoding" the human genome, scientists have yet to establish how many genes it contains, or even what genes do. Gene therapy has so far failed to cure a single person of any major genetic disease.

2 Paul Nightingale of the University of Sussex and Paul Martin of the University of Nottingham are the authors of a new study of this "golden age" of medical science. According to them, the idea that we are living through some kind of "biotech revolution" is a myth propelled by the need to raise money. They have assembled evidence to separate the bio-hype from the reality.

3 The results, published in *Trends in Biotechnology*, are sobering. They reveal that while there have been huge advances in scientific knowledge about the processes of life, these insights have failed to translate into effective therapies. Nightingale and Martin found that so far just a dozen drugs based on biotech insights have emerged that are clearly better than existing treatments. They call for a more realistic approach to biotech, which abandons the assumption that breakthroughs in science inevitably

lead to effective and money-making therapies.

4 Yet the Association of the British Pharmaceutical Industry (ABPI), while admitting that exaggerated claims have been made in the past, insists that the slow emergence of new drugs reflects the fact that gene-level pharmacology is still a new science. It often takes a decade or more to turn insights into marketable drugs.

5 So, is the sad level of pay-off just temporary or does it signal more fundamental problems? The early indications from the research into the human genome suggest that scientists have radically underestimated the size of the challenge they face. In 2000, scientists were stunned to find the human genome contained an estimated 35,000 genes, far below the 100,000-plus expected for the most complex organism on earth. Last month that estimate fell further, to fewer than 25,000.

6 Comparisons with genomes of other organisms have revealed surprises, such as the lack of correlation between the complexity of life-forms and the size of their genomes, and the genetic similarity of

humans and other organisms: barely 300 genes separate mice from humans. Clearly, genes work in far more complex ways than previously thought.

7 Last month, the Lawrence Berkeley National Laboratory, California, showed that deleting large sections of junk DNA from mice seems to have no effect on their development, reproduction or lifespan. Such findings hardly suggest scientists are about to "crack" the human genome code, still less that it will lead to money-spinning cures for major diseases.

8 At the start of the 20th century, physicists believed they possessed the insights needed to predict everything from the position of planets in the future to next year's weather. Then they discovered how effects that were once dismissed as irrelevant can put limits on attempts to predict the future. A century later, life scientists could be facing a similar lesson.

Financial Times

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1p **22** What is the main point made about medical science in paragraph 1?
- **A** It gets too much attention in the papers.
- **B** It has undergone some radical changes recently.
- **C** It is not as advanced as is often suggested.
- **D** It is unlikely to become profitable.

"the idea … is a myth" (paragraph 2, second sentence)

1p **23** How does paragraph 3 relate to this statement?
Paragraph 3
- **A** contradicts it.
- **B** sums up its consequences.
- **C** supports it.
- **D** tones it down.

"The results, published in *Trends in Biotechnology*" (alinea 3, eerste zin)

1p **24** Welk positief resultaat heeft biotechnologisch onderzoek opgeleverd, volgens Paul Nightingale en Paul Martin?

"The results, published in *Trends in Biotechnology*" (alinea 3, eerste zin)

1p **25** Wat is volgens Paul Nightingale en Paul Martin het bewijs dat biotechnologisch onderzoek weinig resultaat heeft opgeleverd?

1p **26** Which of the following summarises the opinion of the ABPI (paragraph 4)?
Biotechnological research
- **A** deserves none of the criticism offered.
- **B** has not produced any useful medicines so far.
- **C** needs more time to prove its practical worth.

2p **27** Geef voor elk van de onderstaande beweringen aan of deze wel of niet in overeenstemming is met de inhoud van de alinea's 5-7.
1 De mens heeft veel meer genen dan enig ander organisme.
2 Het decoderen van het menselijke genoom zal veel geld gaan opleveren.
3 Het menselijke genoom bestaat uit veel minder genen dan men aanvankelijk dacht.
4 Wetenschappers begrijpen nog niet volledig hoe genen werken.
Noteer het nummer van elke bewering, gevolgd door "wel" of "niet".

"A century later, life scientists could be facing a similar lesson." (last sentence of the text)

1p **28** What lesson is meant here?
- **A** One should never doubt one's own theories.
- **B** Seemingly unimportant factors may play a very important role.
- **C** The present cannot be understood without taking the past into account.