

# 10b

## Comments on Korthals: New public responsibilities for life scientists

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First of all I would like to comment on some of the factual considerations with regard to the new revolutionary developments in the life sciences, viz., the booming field of genomics, which forms the basis for this paper. Secondly, some remarks will be made on “Role theory of responsibility” and finally there will be some comments made on the main message of the paper, namely: “New public responsibilities for life scientists”.

### Factual considerations

Genomics and related fields such as proteomics and nutrigenomics, are booming areas indeed. However, to state that because of the enormous potentials, genomics (and nutrigenomics) is one of the key sciences and technologies for the coming decades to improve food security and food quality and safety, may finally turn out to be an exaggeration.

It should be noted that until the 19th century almost nothing was known about the composition of all the different kinds of food and the nutritional requirements of the human being. The present insight into the nutrient composition of food and the nutritional requirements of man are the results of impressive scientific developments in fields like human physiology, food chemistry, biochemistry and cell biology, which took place in the last century. Think about our present in-depth knowledge on the physiological functions of essential nutrients, such as carbohydrates, proteins, lipids, amino acids, vitamins and minerals. Important deficiency diseases became understood and appropriate guidelines could be provided to consumer populations in order to prevent such diseases. In the meantime it has been shown that the onset of many other, mainly chronic, diseases, such as forms of cancer and atherosclerosis is also influenced substantially by diet and nutrition. Also in these cases the adjustment of nutritional behaviour and the modification of the dietary composition have beneficial effects on the overall incidence of such diseases.

The suggestion now is that the genomic age will lead to revolutionary improvements in the prevention of nutrition-related disorders, in addition to the achievements that have already been made. For instance, that each consumer will have his or her gene passport “enabling the unique tailoring of future diets” as stated recently by a journalist of the New York Times (quoted by Korthals in this volume). However, the genetic background of health and disease later in life is very complex in the sense that it is expressed through the interaction of a complex of genes. This makes the predictive value of ‘genomics’ very low on an individual basis. There are only few cases where a disease or disorder is related to one or a few dominant genes

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or chromosomal aberrations, for instance Down's syndrome or haemophilia. Certainly 'genomics' will lead to important improvements in the ability to identify individuals with deficient or anomalous genetic properties, but these will be rather exceptional. Therefore it is most likely that advice to future consumers will mostly be addressed collectively rather than individually.

In my opinion the statement in the paper that "the sharp distinction between food and medicine will fall apart" is also questionable. The era of genomics is just another step ahead in food and nutritional sciences.

### **Role theory of responsibility**

However, my comments are of no concern for the remarks made by Korthals on the position of researchers in this field. For professionals the boundaries between industry, university and policy were already blurred in the pregenomic age. For decades they have already jumped from one sector to another, and the quality of the communication between scientists and consumers is far from perfect. Therefore Korthals's plea for a reconstruction of the public responsibility of scientists stands.

I think it is interesting to note Korthals's views on role responsibility. He states that there are at least two issues that may make role responsibility questionable.

The first is that the role of a life scientist or engineer in an organization or society is not always clear. He argues that concerns of certain roles (like safety) should override other aspects (like profit and management). I can give you an example from my own discipline, toxicology, to illustrate this point. Normally in pharmaceutical and chemical companies the toxicologist in chief directly reports to the board of directors. If the risk assessment turns out to be negative within the context of the anticipated use of the product, the board will generally accept the negative advice given by the toxicologist. A colleague of mine was in such a position in a multinational company. He had a respectable position until there was a major change in the management structure. Shortly thereafter he refused to approve a newly developed product because he felt its use would pose a human-health risk. He was overruled and had to retire from his position. Fortunately such events are very unusual. Apparently at that time role responsibility was not taken seriously by the management of this company.

The second issue which may make role responsibility questionable relates to the position a scientist has with regard to the goals of the organization, its research agenda, its research priorities and its research design. Here Korthals correctly states in my opinion, that scientists have some responsibility to society as well. Also in this case I can refer to some personal experience. In 1966 we were the first ones in Utrecht to report the presence of PCBs (polychlorinated biphenyls) in wildlife tissues. It appeared that we were just second in the world. A Swedish scientist was the first to publish the discovery of these compounds in the *New Scientist*. We wrote to three chemical producers of PCBs asking their scientists for detailed scientific background information. Number one, a German company, did not reply. The second, a French company, replied that what we had found must have been artefacts, because it was supposed to be most unlikely that PCBs would turn up in wildlife samples. However, the third, an American company, responded adequately. Two of their responsible scientists came to our department to discuss our findings and were immediately convinced. A few years later this American company was the first company to stop voluntarily with the production of PCBs. Apparently only in the American company scientists had the mandate to discuss the scientific merits of the problem freely with people outside the company, thus overriding the immediate commercial interests.

### New public responsibilities for life scientists

Two issues are mentioned under this heading in Korthals's paper. The first one refers to research priorities, the second to what I would like to call the containment of the different scientific duties a scientist may have; The Berlin Wall between doing research, giving advice etc. as described by Korthals.

He states that within the framework of setting priorities life scientists should participate in public debates by giving both information and normative guesses about the possible benefits and losses of the new development. I would prefer 'costs' instead of 'losses'. I feel this already happens in many respects both generally in panels and through the media. But it could be improved. For instance, scientists could improve their abilities to communicate with the media. In the US the Foundation for American Communications (FACS) has published a media guide for academics which is very helpful (Rodgers and Adams 1994). But improvements could also be made within regulatory frameworks. A few years ago a panel of governmental scientists from the UK, Sweden, Denmark and The Netherlands proposed a framework for an integration of risk analysis and trust that comprises the involvement of expert panels as well as citizen's panels as shown in Figure 1. The scheme has not yet been approved officially but the principles are increasingly applied informally in various countries. This model deserves to be given a wider application to stimulate debates between scientists and the public in other fields of science as well.

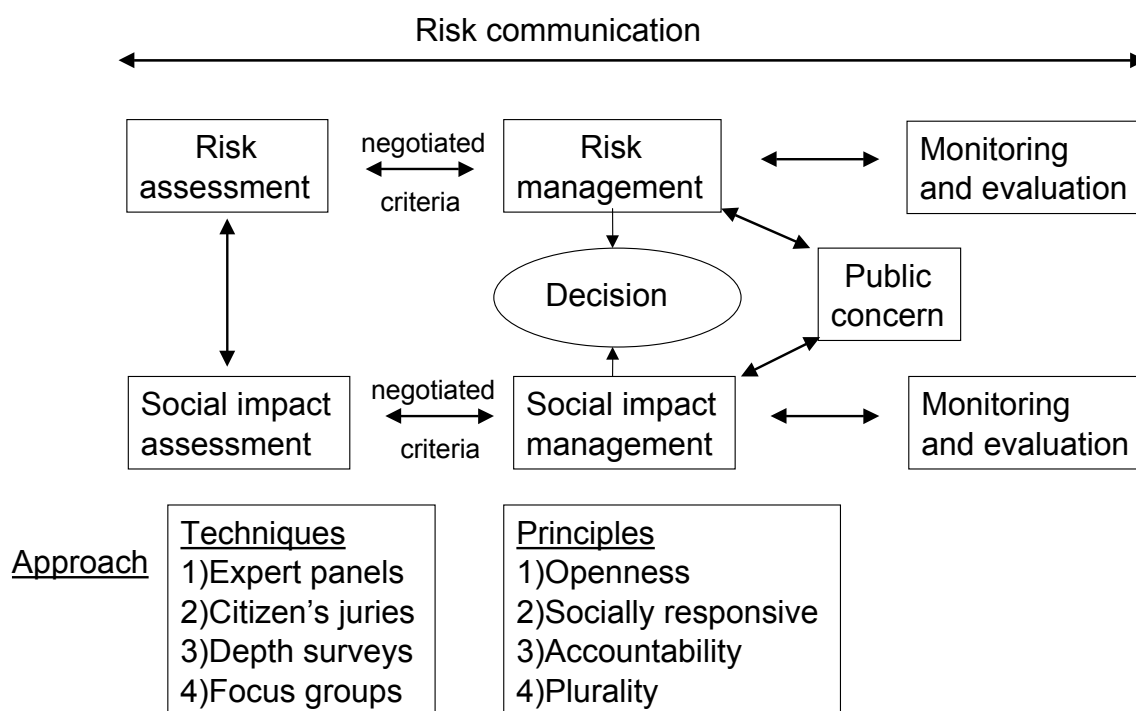


Figure 1. Integrated risk analysis and trust (slightly modified version of the scheme presented by Barling et al. 1999)

However, irrespective of the model chosen the public responsibility of the scientists will mainly remain a matter of personal integrity. If they cannot meet the appropriate standards in this respect they should not be allowed to cross Korthals's Chinese Wall.

## References

- Barling, D., De Vriend, H., Cornelese, J.A., et al., 1999. The social aspects of food biotechnology: a European view. *Environmental Toxicology and Pharmacology*, 7 (2), 85-93.
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