



## EDITORIAL

## Antibiotic resistance and genetically modified plants

Is 'rare' rare enough to be acceptable?

Increasing microbial resistance to antibiotics is a well-established threat to human health and so there is a need for a global strategy to combat this increase (1). In the past, attention has mostly been paid to create a holistic strategy for usage of these drugs in prophylactic and therapeutic human and veterinary medicine.

It is well known that in creating genetically modified (GM) seeds and plants, antibiotic resistance genes are commonly used as marker genes for the selection of transformed plant cells. In parallel, concern has been addressed about whether horizontal genes transfer (HGT) of these genes from the plant material to environmental microorganisms can take place, thereby – in the next step – compromising the therapeutic value of antibiotics in human and veterinary medicine. In a report funded by the European Union (EU), it was concluded that the acquisition of new genes, such as antibiotic resistance genes from plant to environmental bacteria, might be possible. Therefore, it was recommended that only genes coding for antibiotics not used in human and veterinary medicine should be allowed when making GM seeds and plants (2).

In a very recent article (3), it was claimed that 'giving the genetically low mechanistic probability of horizontal transfer of non-mobile DNA in complex environments such as soil or the gastrointestinal tract, HGT will initially be present at an exceedingly low frequency in the overall bacterial population. It may therefore take months, years or even longer for the few initially transformed cells to divide and numerically out-compete non-transformed members ...'.

In this journal, you will find an open letter from Dr Mae Wan Ho, entitled 'Horizontal transfer of GM DNA widespread. Why is almost no one looking?' (4), in which she challenges the philosophy behind the above-mentioned article. She draws our attention to recent

scientific work done in China demonstrating a specific plasmid, used to make GM plants and coding for very potent beta-lactamases, in six Chinese rivers.

If the Chinese findings are correct, the burning question is: Where do we go from here? We should realize that the presence of resistance genes in GM crops represents a much larger burden to the microbial world than all prophylactic and therapeutic use of antibiotics. In addition, the history of antibiotics contains many examples of antibiotic resistance at first reported as 'rare events' and then rapidly becoming worldwide nightmares. Thus, in this context, a 'rare event' is certainly not rare enough to be neglected. In the millennium-report mentioned above (1), the then-General Director of World Health Organization underlined the importance of having a global strategy when combating the increase in antimicrobial resistance. It goes without saying that GM plants and seeds containing such genes have to be included in this strategy.

*Tore Midtvedt*  
Editor-in-Chief

### References

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