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LETTER TO THE EDITOR

Use of genetically modified microbes for human health

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Sir,
The publication by Ott et al. (1) restates the important, and topical, use of microbes in treating
disease, in this case lymphoid immunodeficiencies. However, not everyone agrees that recombinant
bacteria should be used in humans, and one particular submission to this journal called for a
ban of such uses, a viewpoint that we wish to now strongly challenge (2).

The primary concerns, quite rightly, are safety and avoidance of overt environmental release. However,
we believe that there are very good reasons for continuing to develop novel recombinant probiotic
technologies. In a precedent-setting case, the insertion upstream and downstream of thyA flanking a
series of hIL10 expression cassettes in Lactococcus lactis MG1363 (3) was sufficient for the Dutch
regulatory agency to permit human trials with this organism. The results showed expression of human
interleukin 10 (IL-10) and no detectable environmental release of the organism occurred. This was
due to the requirement for thymidine or thymine for
growth and survival (4).

Bacterial genetic alterations occur all the time in
nature, often precipitated by the action of humans,
as exemplified by overuse of antibiotics. Genomic
sequencing has shown that Lactobacillus species hold
no major virulence properties, and this is leading to
the creation of recombinant strains that may poten-
tially prevent HIV, enhance host cell deficiencies,
treat inflammatory disease, and provide oral vacci-
nation routes for the prevention of viral and bacterial pathogens (5,6).

Collectively, scientists and regulators must explore
to ways to balance safety and environmental exposure
with the benefits that recombinant organisms might
provide. Whether the end target is immunodeficien-
cies or other diseases, particularly those causing
enormous suffering and death around the world,
the use of recombinant lactobacilli or avirulent
‘pathogens’ should be permitted if sufficiently strin-
gent preclinical testing has been performed and
adequate surveillance systems are in place. Such
rational steps, and reasoned arguments, differ mark-
edly from the approach taken by Cummins and Ho
(2), whose use of words such as ‘rogue’, ‘nasty’, and
‘warfare’, and an unknown definition of probiotics
instead of a generally agreed upon definition (7,8) –
appear to focus more on sensationalism than on
common sense.

References
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2 G. Reid et al.


