

Date: Sun, 21 Jul 2002 14:11:42 -0500
From: "Abigail Salyers" <abigails@uiuc.edu>
Subject: skewed priorities

I have not contributed to AgBioWorld during the past year because as president of the 42,000 member American Society for Microbiology, my attention was focused on real infectious disease problems. Frankly, plant biotechnology is one of the few bright spots in the human health safety picture, so it seemed safe to ignore it. I was just communicating with the staff at ASM about a huge infectious disease setback, the isolation of the first known fully vancomycin resistant strain of *Staphylococcus aureus*, a warning of infectious disease disasters to come, when an acquaintance sent me a copy of a manuscript by Netherwood et al, which was getting a considerable amount of media attention in Europe. This manuscript purports to show that DNA from GM plants gets into intestinal bacteria. In the U.S., this report would have been dismissed immediately as incomplete science (at best) and junk science (at worst). The authors reach their conclusion based on a weak PCR signal that picked up the epsps gene detected in a subcultured mixed culture from the fluid from an ileostomy patient. The "control" was fluid from the same patient starved for about a day before being given as substantial dose of soy protein products containing GMs soy flour. No signal was found in a bacterial fraction from normal people with an intact colon. This should have raised an immediate question that the authors apparently did not consider: Was the signal they were detecting coming from a soil bacterium that either contaminated the flour preparation or the ileostomy bag. Recall that the epsps gene is a bacterial gene isolated originally from a soil bacterium.

Ileostomists have been an extremely valuable and generous group of people who have participated willingly in many studies designed to determine what dietary materials get through the small intestine. But as a human model system, they have some limitations. One is that people whose small intestine has been fused to an opening to a hole that allows them to expel intestinal fluid into a plastic bag. A bacterial population that is associated specifically with that unusual physiology develops and has not been well characterized. It can include bacteria from the external environment, including bacteria from soil, that would not normally be able to survive in the intestines of people who have intact colons. The data presented in the manuscript may simply reflect this feature of ileostomy patients, especially in view of the fact that no such signal was found in feces from people with intact colons.

My real problem with this study, however, arises from a deeper concern. Who cares whether DNA from plants is entering bacteria? Also, keep in mind that if one gene is getting in, presumably all plant genes, GM or not, are getting in as well. So this is not exactly a new phenomenon. More to the point, since the concern expressed about GM plants is focused on the antibiotic resistance genes they carry and the concern that these might get into intestinal bacteria, you might ask why the authors did not focus on the resistance genes. The answer is simple. The genes cloned back in the 1970s for use as marker genes in cloning vectors are so widespread that they would have had a background that swamped any signal they could detect. Does this suggest a simple conclusion? Even if the rare case of marker genes from transgenic plants did get into bacteria, so what? This would be the infectious disease nonevent of the century.

Who is paying for these studies? Are they living in the 21st century? In

the US, it would be difficult or impossible to get money for a study like this one because we take into account that against a background of over 100,000 deaths due to hospital-acquired infections in the US alone, many of which are caused by antibiotic-resistant bacteria (which, incidentally, got resistant the old-fashioned ways - through mutation or acquiring genes from other bacteria) who would invent non-existent safety problems to study?

I once explained this European hysteria about GM plants to a science writer in the following. Imagine that you are in your home and hear noises. Looking out the window, you see a gang of thugs in the process of breaking through your front door. You run to the phone and call the police. A recorded message tells you that the police are unable to respond to your problem because they are attending a workshop on what their response would be if space aliens landed in your town. Think about it.

+++++