



# FORECAST CRITIQUES

## Critical Assessments of Recent Forecasts

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### BIOTECHNOLOGY: FUTURE BENEFITS AND RISKS

Since new techniques for altering genetic material and cells were first developed in the 1970s, forecasters have been sharply divided over the future promise of biotechnology. On one hand, some proponents have heralded biotechnology as the cornerstone of the next great industrial revolution, promising rapid development of inexpensive drugs, vaccines, crops and other applications. On the other hand, certain biotechnology critics have painted an alarming portrait of the potential risks of genetically-engineered organisms in the environment.

This *Forecast Critique* reviews key claims of both sides of the biotechnology debate.

**While most scientists urge proceeding with caution, dire warnings of ecological disaster have been largely discounted by the scientific community.**

#### 1. Laboratory work has proved safe.

Initial concern about the new biotechnologies focused on the safety of recombinant DNA experiments with the bacterium *E. coli* in the laboratory. Some communities sought to restrict biotechnology research during the mid-1970s. In response, the National Institutes of Health developed biotechnology research guidelines in 1976, which were revised in 1980 to address commercial-scale production of recombinant organisms. These guidelines have evolved over time and are still in place today.

#### 2. The vast majority of biotechnological applications do not involve the release of organisms into the environment.

One of the more contentious issues posed by the new biotechnologies is the potential for negative ecological effects due to the planned introduction (or "deliberate release") of genetically-engineered organisms into the environment. Public attention to this issue (discussed below) tends to overshadow the fact that most biotechnology applications do not involve any type of environmental release.

Seventy-five percent of biotechnology investment is devoted to pharmaceutical industry applications, which are at least as safely derived as chemically-derived drugs are.

#### 3. The risks associated with introducing genetically-engineered organisms into the environment are similar to those posed by unmodified organisms or organisms modified by other means.

For centuries, humans have employed selective breeding methods to recombine genetic material in