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Happier, hornier, hairier

Those who searched for "that special Xmas gift" last month may have come across a "very special Xmas offer from US nutraceutical company Longevity Labs." The offer—cut-price access to the "health miracle" that is recombinant human growth hormone—promises a product that will provide "improved muscle strength, increased sexual potency, boosted energy levels, reduced wrinkle levels, enhanced emotional stability," and a memory like an elephant (we made up the elephant bit). Buried in the small print is a note that some recipients might get "sore joints and swelling". But with everybody swelling up on turkey dinners and plum pudding during the holidays, nobody will *really* notice, will they?

All this might not matter if it were not for the fact that Longevity Labs is one of 11 other companies currently offering recombinant human growth hormone for sale as a "lifestyle enhancer." Taking the marketing strategy further, perhaps they would consider a campaign to inform athletes of the tremendous performance benefits associated with this product. Better still, Amgen might consider a marketing campaign for erythropoietin aimed at professional cyclists before next year's Tour de France?

Of course, marketing products as "lifestyle drugs"—loosely defined as therapies that aim to address attributes associated with social or lifestyle problems—is nothing new. Increasingly, companies are persuading patients that nature has cursed them with a new disease that only their drugs can cure. Some have called this the medicalization of life. *The British Medical Journal* has called it "disease mongering."

Because the productivity of giant drug companies is none too high at the moment—the entire multibillion-dollar pharmaceutical industry succeeded in launching a mere one chemical entity against a novel target in 2001—many pharma companies have decided to forget about nasty, complex diseases and unmet medical needs and instead have come up with highly marketable lifestyle drugs. It is no secret that Merck's Propecia treatment for baldness, Roche's Xenical for obesity, Eli Lilly's Prozac for depression, and Pfizer's Viagra for male impotence are among the most successful blockbuster drugs in the industry today.

None of these blockbusters came about through shiny new high-throughput rational drug discovery platforms offered by biotechnology companies (unfortunately, these don't seem to work as quickly or efficiently as advertised). Instead, these drugs came the tried-and-tested way—through serendipitous clinical observation. Thus, Propecia was originally indicated to block the metabolism of testosterone to shrink the size of prostate, and was only later marketed for hair loss. And Viagra was originally tested as blocker of phosphodiesterase type 5 in cardiovascular patients and subsequently switched to erectile dysfunction when patients started getting frisky in trials. Indeed, Allergan's Botox (recombinant botulinum toxin A) is marketed both as a wrinkle reducer and as a treatment for migraine. The success of all these products confirms the demand for drugs that improve social life or make up for social inadequacies.

Selling sickness is obviously profitable. Worldwide sales of Viagra alone reached over $1.5 billion in 2001. But biotechnology companies should steer well clear of the pill-for-every-ill paradigm. There are plenty of real unmet medical needs that require new therapies. There are plenty of orphan indications that big pharma won't touch because the patient populations aren't big enough. And there are plenty of failed drugs that might be resurrected if the right group of patients were identified.

Back in the 1980s, recombinant growth hormone launched an entire industry. Since then, Genentech's growth hormone has alleviated the suffering of countless thousands of individuals with growth-hormone deficiency, Turner syndrome, and chronic kidney disease. Companies like Longevity diminish that achievement.

It's a gas

Despite the gloomy fact that last year was the worst in recent memory for the biotechnology industry, *Nature Biotechnology* is pleased to announce that innovation in some areas is as fresh and vigorous as it always was. At least, it is if you believe news released in December by the American Chemical Society.

Late last year, the society announced a special report to commemorate the 50th anniversary of the *Journal of Agricultural and Food Chemistry*. The report divulged exciting news about plans to create "green cows." No, no, not green-colored cows (the press release helpfully points out), but environmentally cleaner cows!

The big problem, it seems, is that all these cattle lowing in the mangers and fields have been chomping the cud and producing too much methane as a result of digestion and "belching" (thankfully no other bodily functions are mentioned in the release). Methane is *bad*, apparently, because it is "a major contributor to the greenhouse effect in the atmosphere (second only to carbon dioxide), which many scientists think contributes to global warming." Although the ACS supplied no figures to quantify methane emissions from cows, a quick search of the literature reveals an estimate from the US EPA that domestic livestock contributes 20% of the total methane in the atmosphere. At this stage, *Nature Biotechnology* remains uncertain as to the extent of the threat posed by bovine-derived gas to global meteorological systems.

Whatever the case, all is not lost (here's where biotechnology comes in). Researchers are apparently working around the clock to alter the digestive process in cattle, either by removing the microorganisms that produce methane from their stomachs or by creating microorganisms that can produce metabolic products other than methane. As the release puts it: "end result: green cows."

Here then, at least, is one application where agbiotech comes up smelling like daisies.