

# The rising cost of modern medicines – seeds of hope



**O**ur medicines are getting more expensive to produce, particularly protein-based pharmaceuticals that are made by fermentation. For example, the anti-cancer drugs herceptin and erbitux (two therapeutic antibodies) have been rejected by the UK's National Health Service on the grounds of cost-effectiveness. Such problems are compounded by the increasing complexity of new medicines, e.g. we need to develop multicomponent vaccines or cocktails of antibodies to do battle against our most challenging diseases – TB, HIV and malaria – but this multiplies the production costs. We also face increasing demand for medicines addressing new medical needs both in developed and developing countries. What hope is there for the future as we face these mounting constraints?

Plants may provide an answer. Plants can be used to produce recombinant protein medicines such as vaccines and antibodies, both inexpensively and on a massive scale. A field of tobacco plants could produce as much antibody in a year as ten conventional fermenters, but at a fraction of the cost and with virtually no up-front investment. Plant-derived pharmaceuticals offer hope for the future of medicines in Europe, but their impact in the developing world may be even greater. Developing countries are plagued by diseases that barely register in the West, with the result that little R&D investment is forthcoming. Infectious diseases kill millions every year, but because those most at risk are impoverished, there has been little incentive for drug companies to invest in novel vaccines and therapies.

Inexpensive plant-derived pharmaceuticals could provide a life-line in the developing world by allowing low-cost entry into R&D.

Pharma-Planta is a consortium of 40 academic and industrial organizations in Europe and South Africa which is funded by the EC as part of the Sixth Framework Programme. Pharma-Planta aims to develop a plant-based production platform for protein-based pharmaceuticals (antibodies and vaccines) in Europe and to enter an HIV-neutralizing monoclonal antibody into human clinical trials. Pharma-Planta is also working to establish freedom to operate for its products to be used in developing countries, and the participating scientists have all agreed that new intellectual property arising from the project should be licensed free to developing countries for humanitarian use.

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