a prion fold. Hence, the beneficial effect of prions does not seem limited to yeasts; it may also be operating in multicellular organisms. For now, it is safe to say that the unexpected twists and turns in prion biology will keep researchers busy for years.

Michael Burwinkel, Nikola Holtkamp, Michael Baier
Project Neurodegenerative Diseases, Robert-Koch-Institut, 13353 Berlin, Germany (M Burwinkel, M Baier); and Institute of Neuropathology, Humboldt University, 13353 Berlin, Germany (NH)
baierm@rki.de

We declare that we have no conflict of interest.


Not-for-profit drugs—no longer an oxymoron?

Chinese cultivation of sweet wormwood (Artemisia annua) is set to increase ten-fold next year in an attempt to meet the rising demand for artemisinin, but this drug will still be expensive. The semi-synthetic agents, artemether and artesunate, are not perfect either. However, medicinal chemists and pharmacologists have continued to play around with these peroxidic antimalarials. Jonathan Vennerstrom and colleagues recently reported that a wholly synthetic trioxolane now offers “economically feasible and scalable synthesis, superior antimalarial activity and an improved biopharmaceutical profile”. Human studies with OZ277 (or RBx-11160) are only just beginning and the interest in this antimalarial candidate owes as much to the manner of its development as to its clinical potential.

In 2002, a Médecins Sans Frontières working group recorded a grave imbalance between pharmaceutical innovation and global burdens of disease. The traditional pharmaceutical industry’s research base had lost interest in tropical illnesses. These are not the rare “orphan diseases” as recognised by the US Orphan Drug Act—for example, visceral leishmaniasis kills an estimated 200 000 people every year. Nonetheless to attract big investment in research and development for profit, a disease has to afflict not just large numbers of patients but also those who can pay. Only 10% of the world’s disease burden is targeted by 90% of annual global spending on health research and development.

There has been no shortage of imaginative social-market solutions to this problem—including straight gifts such as the Mectizan Donation Program and discounted pricing—but most of the recent ideas take the form of public-private partnerships. These partnerships have flowered since the arrival of the International AIDS Vaccine Initiative in 1996. The Geneva-based Initiative on Public-Private
Partnerships for Health (IPPPH)\(^1\) knows of about 90. The partnerships and related schemes vary in structure, scale, and financing arrangements. Some focus on one disease or even one candidate product; several large alliances are concerned with the more equitable application of existing resources. Yet others, the product-development partnerships, foster basic research and are essentially innovative. Their overall philanthropic purpose apart, they do have something in common. Not one has seen a novel drug or vaccine through to registration or handed over a product if the affordability target is not being met.

Affordability is the key. Prominent examples of all types of partnerships tend to be in infectious and parasitic diseases, but they are required elsewhere. They also exist in contraception and are needed, for example, in noncommunicable diseases. In many instances, the partnership’s stakeholders (as opposed to shareholders) are involved with a portfolio of projects, 20 or more. The Medicines for Malaria Venture (MMV) has 21 projects.\(^4\) Not all of them will succeed but MMV is hopeful of getting one of its candidates through to launch before the original target of 2010. If the winner proves to be OZ277, the commercial partner would be the Indian firm Ranbaxy Pharmaceuticals, a successful manufacturer of generics. For three partnerships, Wheeler and Berkley have outlined the options for managing handovers in general terms.\(^3\) For instance, “reasonable profit” could be defined as cost plus no more than 10%; intellectual property rights could be enforced to allow for low prices; or companies could charge what they want in the industrial world and for private-sector prescriptions while accepting restraint elsewhere, a strategy perhaps more relevant to AIDS or tuberculosis than Chagas’ disease. These partnerships will need access to specialised skills in auditing manufacturing costs and may want to write in a clause allowing them to take back the product if the affordability target is not being met.

Can so many partnerships be sustained financially? Probably not. At a meeting organised by IPPPH in London earlier this year, attendees concentrated on the 20 or so product-development partnerships and suggested a minimum funding gap by the year 2007 of US$1·2 billion.\(^6\) Yet the partnerships have been highly successful fund raisers. They have attracted about $2 billion in the past 5 years,\(^7\) most notably from the Bill & Melinda Gates and Rockefeller Foundations, organisations to which international public health owes so much. Of the $568 million allocated to health by the Gates Foundation in 2003,
$100 million was given to the Program for Appropriate Technology in Health for the Malaria Vaccine Initiative; $30 million to the Foundation for Innovative New Diagnostics, in Geneva, which is one of the few ventures that specialises in diagnostics rather than drugs or vaccines; $83 million went to the Aeras Global Tuberculosis Vaccine Foundation; with $40 million for the Medicines for Malaria Venture. The Institute for One World Health is another beneficiary. Last month Oxfam noted the poor response from the international community to the flood crisis in Bangladesh. Perhaps donors cannot deal with several emergencies at a time and conflict-driven crises in Afghanistan, Iraq, and Sudan still need attention. The public-private partnerships have not yet experienced donor fatigue but even if the donor base broadens, as more and more organisations see the benefits of joining in, some sort of shakeout looks inevitable.

How success should be judged was another question raised at the London meeting. The profit to earnings ratios of a market-force world will not work for the social venture capitalist, however much these new partnerships borrow from classical business models in other ways. Future partners, making difficult choices about who to support, will look askance at soft endpoints and welcome some standardisation in the way results are recorded, but this should be done without suppressing the creativity and drive that characterise so many of these partnerships.

Private financing of public-hospital building has been criticised in the UK, but there has been praise for the reverse, the global use of social venture capital to fill in gaps left by the private sector in poorer countries’ requirements for affordable drugs, vaccines, and diagnostics. The experiments are not yet a decade old. The generous funding has not gone to anyone’s head. Managerial costs appear to be well controlled. Projects are rigorously selected from a mountain of proposals (eg, MMV received 107 ideas in its 2002–03 call for proposals but only seven made it to the partnership’s portfolio). A decade ago the notion of a research-based programme for new drug development that was not wed to the profit motive seemed absurd. No longer. Yes, some problems are emerging but they can be overcome.

David Sharp
c/o The Lancet
London NW1 7BY, UK
