already receiving antimicrobials. We feel that it would have been better to screen urine samples received for culture for the presence of any antimicrobials in the sample to ensure judicious therapeutic intervention.

Recently, investigators at the Hamad Medical Corporation, Doha, Qatar, carried out antibiotic screening of 1 680 urine samples (employing *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923) that were being processed for culture. There were 2 494 culture-positive urine samples that included 388 samples with antibacterial substances. Among these samples were 345 sterile samples, 32 with insignificant growth samples, and 11 with mixed growth.[2]

Screening urine samples received at 3 Military Hospital in Bloemfontein1 would not be an insurmountable task. Antibacterial substance screening of urine samples was feasible even more than 40 years ago at the All India Institute of Medical Sciences, New Delhi, India,[3] where screening of 426 urine samples was done by employing the standard Oxford strain of *S. aureus*. There was demonstrable antibacterial activity in 127 samples, accompanied by bacterial growth in 63 samples. Isolates included *E. coli* – 28 isolates, *Klebsiella* species – 13, *Pseudomonas aeruginosa* – 10, *Proteus spp*. – 6, *S. aureus* – 3, *Alkaligenes faecalis* – 2, and *Streptococcus faecalis* – 1. A history of prior antibiotic use could be obtained in 25 cases only, though there was no relevant information in the laboratory requisition slips. It was also possible in 7 cases to identify the antibiotics being used by the patients. The isolates in the urine samples were resistant *in vitro* to the prescribed antibiotics. Even with an adequate amount of antibiotic in the urine, there was little benefit to the individual.

Obviously, any sterile culture report on a urine sample from a patient with a demonstrable antibacterial activity could be erroneous unless a subsequent urine culture is found to be sterile. Laboratory personnel would not ignore patients with rather low bacterial counts in any urine sample with concurrent antibacterial activity. Such isolates might represent either a declining population of susceptible bacteria or an ascending antibiotic-resistant bacteria population.

Last but not least, any expenditure for carrying out concurrent screening for antibacterial substances in all urine samples cultured at 3 Military Hospital in Bloemfontein[1] or elsewhere would be cost-effective, and will lead to better management of urinary tract infections and would ensure rational disease management.

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**Dr van Vuuren replies:** All urine samples included in our study were processed by the National Health Laboratories Services (NHLS) in Bloemfontein. In line with standard procedure, *Bacillus subtilis* ATCC 6633 was used to screen for the presence of antibiotics, and a leukocyte count performed on all urine samples sent for culture at the NHLS. If there is no growth of bacteria in the presence of antibiotics, significant numbers of leukocytes warrant further investigation.

As we excluded culture-negative samples from our analysis, we obviously cannot comment on the number of samples with no growth due to the presence of antibiotics. Apart from the possibilities mentioned in our article, antibiotic administration prior to sample collection may be another cause for negative cultures.

## Questioning the UCT Lung Institute

**To the Editor:** The enthusiastic account of the 10th anniversary of UCT's Lung Institute (Pty) Ltd in the June issue[1] raises many questions. Is medicine a caring profession or a business? Is it desirable that the replication of such initiatives be encouraged? Is it possible to replicate it even if one wanted to? Is the Institute sustainable in the light of its dependence on the exceptional ability and determination of a unique individual?

Judged as a business, the Lung Institute seems to be a resounding success. Starting 10 years ago with a little 'nest egg' and support from a pharmaceutical company, it is now a limited company with a budget, according to Professor Eric Bateman – founder and CEO – of R40 million a year.

Although it sounds as if he is proselytising, Professor Bateman says he is not, and I believe him. To enable others to follow would require that he instruct them in the finer arts of the business such as how the Institute is kept 'light on its feet' and circumvents burdensome bureaucracy, which he identifies as 'the enemy of enterprise'. Every successful businessman is entitled to his secrets, and no businessman in his right senses would deliberately open up his market to competition.

However much I admire the achievement, I find the self-promotion distasteful. There are several aspects of the arrangement that I don't understand, and one of them is of deep concern.

What I don't understand is what the university gets out of its wholly owned tax-free subsidiary for 'educational and charitable purposes'. There are presumably no dividends, because 'Surpluses are utilised for the activities of the institute in pursuant of goals'.[2]

How much does UCT earn from government subsidies from Institute publications in peer-reviewed journals? How does the Institute add value to the core university function of teaching? A few postgraduate researchers are mentioned, but what about a contribution to medical student and postgraduate registrar instruction and supervision?

What is of greatest concern to me is the fact that the Lung Institute and GINA[3] – the Global Initiative for Asthma, of which Professor Bateman has been appointed [sic] Chair of the Executive and Science Committees[4] – are both dependent for their existence on the pharmaceutical industry.[5]

For me it's like a nightmare come true. At about the time the Lung Institute was founded, John Le Carré, the noted author, was warning:

'But Big Pharma is also engaged in the deliberate seduction of the medical profession, country by country, worldwide. It is spending a fortune on influencing, hiring and purchasing academic judgement [sic] to a point where, in a few years' time, if Big Pharma continues unchecked on its present happy path, unbought medical opinion will be hard to find.'[6]

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***SAMJ* News Editor Chris Bateman replies:** The article was the result of a confluence of events. Firstly, several deans of medicine

had painted an alarming picture to the Parliamentary Portfolio Committee on Health of dysfunctional funding of tertiary institutions and, more importantly, the paucity of medical clinical research in this country; this remained fresh in my mind. Secondly, having reported on some exemplary application of the Lung Institute's research in the field, I decided that its 10th anniversary was worthy of coverage, given the context of which I'd recently become aware. The Institute's achievements speak for themselves. While the long-distance runner metaphor may have sounded 'enthusiastic', the facts made it a readily available journalistic tool to convey the message in an entertaining way. As for being 'distasteful', that's a matter of opinion and goes to a debate that Professor Klein has raised – which my article did not speak to. Lastly, and perhaps pertinently for the record (given the literary enthusiasm I displayed), a disclaimer was printed at the bottom of the article stating that I am in no way related to Professor Bateman. Professor Klein puts an entirely different set of issues on the table, and if my article 'raises many questions', that is in keeping with my job.

**Professor S R Benatar, Acting Chair, on behalf of the University of Cape Town Lung Institute directors, replies:** In response to Max Klein`s uninformed criticisms and questions about the Lung Institute based on a news report, we begin by recommending that he read the 10-year formal report of the Lung Institute's activities (http://www.lunginstitute.co.za).

As part of the extended Faculty of Health Sciences platform for teaching, learning and research, its mission is to serve the University of Cape Town, the Faculty of Health Sciences and the community. Its widely acknowledged significant contributions to all the above have earned its researchers many honours over the past decade.

Apart from its legal status, the Institute is no different from a large research grouping within an academic department. Its academic staff, whose work in the Institute is supported by their research income, have formal faculty appointments and contribute to teaching (all levels) within their departments. Several postgraduate students undertake projects in the Institute towards master's and doctoral degrees, funded by the Institute and supervised by Institute academic staff.

Although the Institute does not directly earn state subsidy, publications by its members with UCT appointments draw subsidy for UCT, as in any university department. In addition to retaining and benefiting from the very considerable outputs of highly motivated staff, without having to provide the overheads ordinarily required for a large research grouping, numerous collaborations with other university departments have generated successful joint grant applications, and support for postgraduates.

The Institute strikingly provides a platform for a wide range of socially responsive and public service activities. Senior Institute staff deliver regular unpaid clinical and consultation services in the Division of Pulmonology, the Department of Critical Care at Groote Schuur Hospital and Brooklyn and Brewelskloof TB hospitals, and at primary care clinics in the Western Cape.

Notable academic outputs include studies of the burden of lung diseases in South Africa, the testing of new drugs, diagnostics and vaccines for tuberculosis, and a reference allergy service. In the field of knowledge translation, an innovative, integrated practice manual for chronic and infectious diseases for use in primary care clinics has been developed, and is being adopted and rolled out in South Africa as well as in Malawi and Kenya. The Knowledge Translation Unit has trained more than 800 nurse trainers and more than 13 000 primary care nurses in the use of this integrated care guideline.

While an initial and welcome pharma donation received by UCT provided for constructing the building, we refute any misconception that the Institute is entirely dependent on the pharmaceutical industry. We acknowledge the challenges facing most academic institutions worldwide in their relations with industry, but the Institute's 10-year report provides evidence for the success of our endeavours to become increasingly independent from such support. For several years, income from grants and non-pharmaceutical sources has exceeded income received from research contracts with the pharmaceutical industry. The governing Board of Directors with a finance committee appointed by the directors oversees all aspects of Institute activities, ensuring that funds obtained through research contracts with pharma are raised and utilised transparently, with full accountability and in keeping with university policy.

## Origin of recurrent *Plasmodium vivax* malaria – a new theory

**To the Editor:** The phenomenon of long-term relapse is familiar to many persons who have contracted malaria, and to their doctors. Attacks of *Plasmodium vivax* malaria (so-called benign tertian malaria) in particular can occur after symptomatic illness has been absent in the patient for months or years. Recurrent clinical *P. vivax* manifestations have been thought to originate from a dormant liver form, the discovery of which[1] has become recognised as a classic landmark in the history of parasitology and tropical medicine. I correctly predicted the existence of the stage concerned (extrapolating from my rodent-associated research while a PhD student at Imperial College London) and coined the term 'hypnozoite' for it.[2] For the past three decades, medical students worldwide have been taught that hypnozoites give rise to malarial relapse. However, new findings indicate that there might well be a second cause of recurrent *P. vivax* malaria.

Parasites responsible for recurrence of benign tertian malaria are frequently genotypically different (determined by molecular techniques) from those that gave rise to the initial symptomatic bout of disease. In other cases, parasites are genetically similar.[3,4] The genotypes of sporozoites in inocula that are injected into the skin by mosquitoes are known to be diverse. Assuming that hypnozoites are directly sporozoite-derived (which they appear to be[5]), and that re-infection of any given patient has not taken place, the former (heterologous parasite) situation is therefore perfectly compatible with the hypnozoite concept of relapse.

I now suggest that there is a possible non-hypnozoite basis for the other (i.e. homologous parasite) phenomenon in at least some instances. Rodent malarial stages that might become latent for extended periods have recently been detected in splenic dendritic cells. These parasites are able to infect erythrocytes, and similar forms could be responsible for clinical human malaria that follows splenectomy for splenic trauma.[6] Plasmodial stages like those in rodents will obviously now be searched for in dendritic cells from human spleens. I speculate that such forms or other merozoites may also be the source of recurrent *P. vivax* episodes which are conventionally always ascribed to homologous hypnozoite activation. If a recurrent clinical *P. vivax* attack can indeed be the result of renewed asexual reproduction of merozoites following a period of dormancy, as I hypothesise, then this would explain why parasites isolated from peripheral blood samples in recurrent malaria have sometimes proved to be genetically similar to those that were responsible for the primary clinical infection.

It is easier to appreciate the feasibility of this straightforward explanation than to imagine what the mechanistic basis of a homologous hypnozoite relapse postulation for renewed parasitaemia might be. The latter nevertheless remains a possibility. However, why some sporozoites of a particular genotype would multiply in the liver