



Targeted Photodynamic Therapy (*t*-PDT) to light up Brixen/Bressanone Symposium

London, September 2008: One of Britain's leading photochemists, Professor David Phillips OBE will present PhotoBiotics' latest research on targeted photodynamic therapy (*t*-PDT) to scientists and clinicians at the **7th International Symposium on PDT and PhotoDiagnosis in Clinical Practice**, to be held this year in **Brixen/Bressanone, Italy, on 7-11 October**.¹ A founder member of PhotoBiotics, Professor Phillips says, "We have now demonstrated huge selectivity gains in targeting tumours for destruction by *t*-PDT, compared with conventional methods. Bringing its benefits to the attention of clinicians, by exposure at this symposium, will be an important step toward making *t*-PDT a clinical reality."

In conventional PDT, diseased tissues containing light-activated drugs are illuminated with cold laser light. This converts nearby oxygen into a highly toxic form that destroys any cells in close proximity. To date, PDT has successfully treated head and neck, prostate and skin cancers; and compared to other cancer treatments, PDT leaves little cosmetic scarring and no possibility of drug resistance. But being non-targeted, conventional PDT cannot deliver the drugs specifically to tumours. Also, because the drugs circulate in the body long after treatment, patients are left acutely light-sensitised to skin damage.

PhotoBiotics *t*-PDT is designed to solve all these problems. Light-activated drugs are combined with special tumour-seeking proteins called antibody fragments which carry them specifically to cancerous cells, while rapidly leaving the body before they can cause skin damage. Based on its initial highly promising results,^{2, 3} PhotoBiotics – a biotechnology spin-out company from Imperial College London – has filed four patents, is completing further pre-clinical studies, and will be taking its technology forward into clinical trials, expanding the use of *t*-PDT to many more therapeutic and diagnostic applications. In a recent report published by *BioWorld Today*, PhotoBiotics is one of the top 200 innovative companies leading a new wave of biotechnology development.⁴

Professor Phillips, who will be honoured with a Fellowship of Imperial College London next month, continues: "We have shown how to use tumour-seeking antibody fragments to deliver highly potent light-activated drugs safely and accurately to the site of a cancer. This minimises the risk of healthy tissue being accidentally damaged during the treatment process, while maximising the number of cancer cells that can be destroyed."

And there's an unexpected bonus, Professor Phillips explains. "Quite counter-intuitively, we've also discovered it's possible to attach many more of these drug molecules to smaller antibody fragments than can be linked to much larger whole antibodies, without destroying the useful targeting properties of the fragment itself. *t*-PDT is the way forward for PDT"

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Notes for Editors: Professor Phillips' talk to the Brixen/Bressanone symposium, entitled 'Towards targeted PDT', will be delivered on Friday 10th October at 15.15.

1. For more information on the Brixen Symposium, visit http://www.bio.unipd.it/PDT2008/pagine/Scientific_programme_26aug.pdf
2. 'Targeted photodynamic therapy with multiply loaded recombinant antibody fragments.' *International Journal of Cancer* 2008; **122**: 1155-1163.
3. 'Fluorescence characterisation of multiply-loaded anti-HER2 single-chain Fv-photosensitiser conjugates suitable for photodynamic therapy'. *Photochemical and Photobiological Sciences*. 2007; **6**: 933-939.
4. 'Innovations in Biotechnology 2008: Development-Stage Companies and Scientific Findings Leading the Way', *BioWorld Today*, June 2008. http://www.bioworld.com/servlet/com.accumedia.web.Dispatcher?next=S08438_6064.

About PhotoBiotics (see www.photobiotics.com)

Photobiotics is a spin-out company from Imperial College London developing novel biologically-targeted photodynamic therapeutic (t-PDT) agents to specifically target and destroy diseased cells far more effectively than the conventional PDT in current use, so significantly extending market penetration. Potential applications of this new technology include the diagnosis and therapy of cancer, restenosis following angioplasty, various proliferative skin conditions, or as 'irresistible antibiotics' and many more. PhotoBiotics is highly distinctive in possessing a unique integrated multidisciplinary capability involving chemistry; laser physics and biology (Please see the website).

About PDT

Conventional PDT has an established niche in the treatment of certain cancers and in age related macular degeneration (AMD), with product sales in excess of \$500m annually. However, conventional PDT's clinical development and use have been slow to evolve owing mainly to the novelty of the treatment regimen and to post-treatment systemic photosensitivity. The photosensitising agent remains in the system for up to six weeks post treatment in some cases, and when it reaches the skin, patients can become exquisitely photosensitive to ambient light even on cloudy days, leading to symptoms akin to acute sunburn in uncovered parts of the body. Photobiotics uniquely targeted approach to PDT will overcome the issue of photosensitivity without compromising efficacy, thus greatly extending the potential of this otherwise superior treatment modality.

About Professor David Phillips OBE (from the citation for his Fellowship of Imperial College London)

One of Britain's leading chemists, Professor Phillips joined Imperial College as Professor of Physical Chemistry in 1989 from the Royal Institution of Great Britain, where he was Wolfson Professor of Natural Philosophy and Deputy Director for 10 years. Prof Phillips served as Head of Imperial's Department of Chemistry from 1992 until 2002, during which time he championed multidisciplinary research, doubled the number of research students, introduced new Masters courses and led the Department to the highest possible Research Assessment Exercise rating of 5*.

Professor Phillips is a prodigious researcher, author of 583 publications, and co-founder of the spin-out company PhotoBiotics, which is developing targeted photodynamic therapy for cancer and other indications. His excellence as a researcher and university administrator notwithstanding, it was for services to science education, a field for which he has enormous passion – he has helped thousands of young people to look at science with new eyes - that he was awarded the OBE in 1999.

One of his first acts on arriving at Imperial in 1989 was to lead the establishment of the Schools Liaison Office, now known as Imperial Outreach, which over the years has grown into a highly successful team organising over 85 outreach activities each year. Professor Phillips himself is a regular teacher on these courses, giving highly popular demonstration lectures, and has reached an estimated 250,000 school students through his lifelong dedication to science communication. He is also Chairman and founding member of London Gifted and Talented, collaboration between Imperial College, the London Boroughs of Camden and Westminster and Exscitec that brings education enrichment activities to gifted pupils in schools in all 33 London boroughs. Following his retirement in 2006, he is now Professor Emeritus and Senior Research Investigator, and continues as a valued mentor to the Imperial College outreach staff, as well as being a member of the Scientific Advisory Board of Photobiotics.