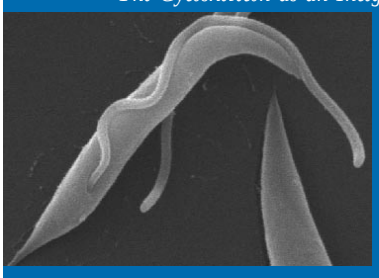
Eukaryotic microbes: something for everyone

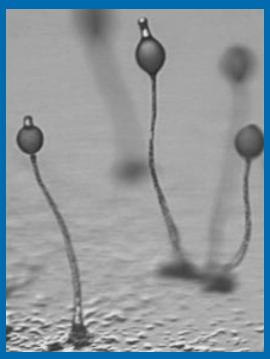
Clive Price

The types of eukaryotic micro-organisms are many and broad-ranging. Clive Price, Convener of the new SGM Group set up to promote this field, describes their significance and what the group hopes to achieve.

Eukaryotic microbes are of major economic importance to the modern world. On the positive side we have vast food and beverage industries founded the world over on the properties of humble yeasts; bread and alcohol, nothing could be more fundamental to human life. Filamentous fungi are widely used in the production of food additives and medicines, in the form of antibiotics. More antagonistically fungi represent increasingly important human pathogens and have long been recognized as the most serious crop plant pathogens. Other eukaryotic microbes are the culprits in several major forms of human and animal infectious disease, including malaria (*Plasmodium*), sleeping sickness (*Trypanosoma brucei*), Chagas disease (*Trypanosoma cruzi*) and leishmaniasis.

In addition most, if not all these organisms serve as important models employed in basic research into the genetics, biochemistry and cell biology of eukaryotes. This clearly constitutes a very broad church that has led to difficulties in terms of promotion and representation of common interests, both scientific and professional, and which is reflected in the number of very successful, but relatively small and often ad hoc societies or interest groups. Many members of the SGM working with microbial eukaryotic systems felt that their interests had been poorly served within the SGM for a considerable time, whilst believing that the SGM could and should provide an appropriate home for them. These concerns were accepted by Council and duly led to the creation of a new group in September 2001. It is not the intention that the SGM should subsume other smaller groups, rather that it is well placed to provide a strong voice in professional matters, ranging from concerns over funding in research and education to recruitment and career structure. The main remit of the Eukaryotic Microbiology Group will be to organize meetings of general interest to that constituency. However, it will be important to identify areas of interest with other groupings within the Society which will emphasize biological commonalities between prokaryotes and eukaryotes. Several immediately suggest themselves: DNA metabolism, the evolution and function of organelles (mitochondria and chloroplasts), fundamentals of quorum sensing and signal transduction. Another area of broad interest is the cytoskeleton which forms the grist for the first SGM eukaryotic symposium, *The Cytoskeleton as an Integrator of Cell Function* to be held on 19–20 September 2002 at the University of Loughborough. There is an exciting list of international speakers covering a wide range of topics and organisms, from bacteria to man. We hope to see many people there to launch the new enterprise (see the enclosed programme booklet for details and a booking form).





Another important role for the group will be to forge links with Societies and interest groups outside of the SGM. A start has already been made in this direction as the second group symposium for UMIST 2003 is being organized by Al Brown and Saul Purton in conjunction with the British Mycological Society and the British Society for Medical Mycology. This meeting will cover four broad biological areas (a) genome organization/sex; (b) pathogenicity; (c) cell signalling; and (d) regulatory mechanisms. In particular it will focus on the insights garnered from post-genomic approaches to these problems (transcript/profiling/proteomics/metabolomics). Discussions are already under way for a meeting covering epigenetic inheritance to be held at Trinity College, Dublin, in 2004 and in due course all of the areas discussed above will be covered. It is important that members recognize that the committee is always open to suggestions of suitable topics for future meetings.

The articles assembled in this edition of *Microbiology Today* provide a flavour of some of the subject areas within eukaryotic microbiology. How do pathogens arise and what differentiates them from their benign relatives? How do fungi respond to nutrient availability and their environment at the level of gene expression? Why are blood-borne pathogens so persistent and difficult to treat? What are the evolutionary relationships between organelles in protists and signalling systems in slime moulds? Why and how do prokaryotes and eukaryotes respond to the presence of DNA damage? These articles will provide general answers to these important questions and serve as primers for those readers whose imagination is captured.

The accompanying illustrations depict various eukaryotic microbes discussed above on the basis that it is a good idea to be able to recognize your neighbour, both friend and foe alike. For the future, we would like to see this group expanded and for its voice to be more strongly represented both within and without the SGM.

● *Clive Price is Convener of the Eukaryotic Microbiology Group. He may be contacted at Biological Sciences, Institute of Environmental and Natural Sciences, Lancaster University, Bailrigg, Lancaster LA1 4YQ, UK.*
Tel. 01524 593137
email c.price1@lancaster.ac.uk

LEFT:
Dictyostelium discoideum.
PAULINE SCHAAP

BELOW:
Candida sp. (upper) and *Saccharomyces cerevisiae* (lower).
PHOTO SGM (UPPER); JAMES BOYNE AND CLIVE PRICE (LOWER)

FAR LEFT BOTTOM:
Trypanosoma brucei.
PHOTO FLAVIA MOREIRA LEITE AND KEITH GULL