

## **Pigmentation in *Staphylococcus aureus***

**Dr J.H. Marshall and Dr J.W. May**

These studies examined the nature, pathway and conditions of production of the main pigment of *S. aureus* – the Golden Staph.

In 1972 Marshall and Rodwell proposed the name staphyloxanthin for the main orange pigment of *S. aureus*. Then in 1982, in what has been described as pioneering work\*, Marshall and Wilmoth described the biosynthetic pathway for production of staphyloxanthin which was then shown to be a glucopyranosyl-triterpenoid-C30-carotenoid.

Post-graduate students:

Ph.D.: G. Wilmoth

M.Sc.: H.F. Dean and Helen Roessler

Research Associate: Dr E.S. Rodwell

Technical Officers: Rhonda Hosie; Joan Sloan

## **Growth, metabolism and physiology of fission yeasts of the genus *Schizosaccharomyces***

**Dr J.W. May and Dr J.H. Marshall**

These wide-ranging studies focussed particularly on *S. pombe* and covered such aspects as the pattern of growth of single cells, regulation of enzyme synthesis, uptake and utilization of specific substrates (e.g. glycerol, malic acid, glucose and fructose), the production of ethanol in batch and continuous culture systems, the mechanisms of xerotolerance, and the isolation and characterization of specific enzymes for catabolism of glycerol.

Of particular note was the discovery in *S. pombe* of a metabolic pathway not previously known to occur in yeasts, namely the catabolism of glycerol via dihydroxyacetone.

Ph.D.: N.M.b.Mahadi; R.Y.C. Kong; Ester Khosa and B.P. Ganthala

M.Sc.: G. Vasiliadis

M.Biotech.: Annette Blane; Alice Hayford; Ester Khosa; G. Mosford; Beth Spies;  
Maya Tedjowajono

Technical Officer: Joan Sloan

## **Microbial Taxonomy**

**Dr J.W. May and Dr P.D. Bridge**

In collaboration with post-graduate students, these investigations, using numerical and conventional methods, investigated the taxonomy and ecology of such diverse micro-organisms as:

(1) Luminous marine bacteria (J.M. Fitzgerald – Ph.D);

- (2) Yeasts isolated from cold-stored grape juice (M.H. Goodall – Ph.D.)
- (3) The fission yeasts – *Schizosaccharomyces* (Sivanayaki. Sittambalam – Dip.Micro.)
- (4) *Moraxella catarrhalis* and related gram-negative cocci (Sangeeta Singh – Dip.Micro.)

## **Phosphate Removal from Domestic and Industrial Wastewaters**

**Dr R.C. Bayly and Dr J.W. May**

The presence of excess amounts of the inorganic nutrients, phosphate and nitrate, in rivers and lakes may permit the undesirable and deleterious growth of plants, algae and cyanobacteria. One of the major sources of such phosphate is the effluent from sewage-treatment systems, particularly of the extended aeration configuration. In the 1970's it was found, initially by accident and later by design, that the presence of an anaerobic stage significantly reduced the concentration of phosphate in the effluent. At that time it was proposed that bacteria, in particular members of the genus *Acinetobacter*, were responsible for the effect by accumulating polyhydroxyalkanoate in the aerobic stage of the system and polyphosphate in the anaerobic stage just prior to separation of the biomass from the effluent.

In the mid 1980's, in collaboration with staff of the CSIRO Division of Chemicals and Polymers, an investigation was initiated into the metabolism, physiology and genetics of polyphosphate and polyhydroxyalkanoate production in *Acinetobacter* isolated from sewage-treatment systems showing high removal of phosphate. It was anticipated that such studies would permit better reactor design and operation.

One of the outcomes of these studies was the design and development of a completely aerobic system, operated as a sequencing batch reactor, which reduced the concentration of phosphate in effluent from conventional extended-aerobic treatment systems to levels well below internationally accepted levels

During the course of the project, collaborative studies were also undertaken with Dr V. Tandoi (Rome) and Dr M. Blonda (Bari) of the CNR Water Research Institute, Italy and with Professor R.J. Seviour and staff of the Biotechnology Research Centre, Latrobe University, Bendigo.

Postdoctoral fellows: Dr Annabelle Duncan, Dr Gavin Rees and Dr Paul Meyers

Postgraduate students:

Ph.D.: G.J. Dumsday; Elise Roper; M. Schembri and A.A. Woods.

Dip.Micro.: Ying Li; N.H. Pilkington and Jolanta Skurczynska

Technical officers: D. Diberadino and G. Vasiliadis.

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