

Small Scale Bio-production: Beyond the Flask.

The BioPark Hertfordshire, Welwyn Garden City, AL7 3AX: Tuesday, November 24, 2009

"Once you can produce it in a flask, what next? The focus of this meeting will be on techniques for the bioproduction of usable quantities of biologic materials, specifically recombinant proteins, monoclonal antibodies, cytokines viruses and other secreted cellular products from eukaryotic cells. Topics covered will include expression systems, mammalian vs. insect vs. other, constitutive vs. transient expression, cell culture medium considerations and culture devices for scale-up that can be used in any laboratory. This meeting should show the fastest pathway from discovery to proof of principle and the production of 100 mgs to several grams of product"

Meeting Chair: Dr John J.S. Cadwell, President and CEO, FiberCell Systems Inc, USA

This meeting has CPD accreditation

- 9:00 – 9:45 **Registration**
- 9:45 – 10:00 **Introduction by the Chairs:** Dr John J.S. Cadwell, President and CEO, FiberCell Systems Inc, USA
- 10:00– 10:30 **Production in hollow fiber**
Vincent Dewar GSK-
- 10:30 – 11:00 **Talk title to be confirmed**
Professor Robert Edwards, Durham University, UK
- 11:00- 11:10 **Speakers photo**
11:10 – 11:30 **Mid-morning break**
- 11:30 – 12:00 **Talk title to be confirmed**
- 12:00 – 12:30 **Moving from the flask to proof of principle - what regulatory questions do I have to answer?**
Dr Colin Love, BioVex UK
- 12:30–13:30 **Lunch and Poster Viewing**
- 13:30 – 14:00 **Talk title to be confirmed**
- 14:00 – 14:30 **Coproduction of biopolymers consisting of Medium chain length 3-hydroxyalkanoic Acid and Exopolysaccharide by *Pseudomonas* CMG607w of marine origin**
Nazia Jamil Department of Microbiology and Molecular Genetics, University of the Punjab, Lahore-54590, Pakistan
- 14:30 – 15:00 Selected oral abstracts
- 15:00 – 15:30 **Afternoon Tea/Coffee and Last Poster Viewing**
- 15:30 – 16:00 **Gram Quantity Production of Monoclonal Antibodies and Recombinant Proteins in a Hollow Fiber Bioreactor System**
Dr John J.S. Cadwell, President and CEO, FiberCell Systems Inc, USA
- 16:00 – 16:30 **Talk title to be confirmed**
- 17:00 **Chairman's summing up.**

Full Abstracts

"Coproduction of biopolymers consisting of Medium chain length 3-hydroxyalkanoic Acid and Exopolysaccharide by *Pseudomonas* CMG607w of marine origin"

Nazia Jamila, Nuzhat Ahmedb, David H. Edwardsc, Hilary K.Youngc and Geof M. Gaddc,

aDepartment of Microbiology and Molecular Genetics, University of the Punjab, Lahore-54590, Pakistan, bCentre for Molecular Genetics, University of Karachi, Karachi-75270, Pakistan, cDepartment of Molecular and Cellular Medicine, University of Dundee, Dundee DD1 9SY, Scotland, UK.

Background

Bioplastics or polyhydroxyalkanoates (PHAs) are a special type of biomaterial. They are polyesters, produced by a range of microorganisms, cultured under different nutrient and environmental conditions. When the carbon substrate is in excess to other growth limiting nutrients like nitrogen, sulfur, phosphorus or oxygen (Madison and Huisman, 1999; Kim and Lenz, 2001; Reddy *et al.*, 2003), many microorganisms can accumulate PHAs as intracellular energy yielding and carbon storage granules. These polymers are accumulated in the form of mobile, amorphous, liquid granules of lipids that provide these microorganisms nutrients under stress conditions (Barnard and Sander, 1989; Sudesh *et al.*, 2000).

Objectives

Characterization of *Pseudomonas* CMG607w for the production Exopolysaccharides and mcl-PHA.

Methods

1. Extraction and Purification of biopolymers from *Pseudomonas* CMG607w.
2. PCR based strategy to identify *PhaC synthase* operon.

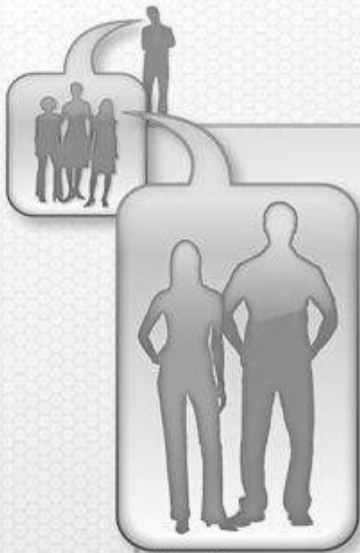
Results

Bioplastic (medium chain length polyhydroxyalkanoate) was extracted and purified from CMG607w bacterial strain isolated from sediment of Layari River out fall to Arabian sea. PHA synthesis was substrate depended in CMG607w. In presence of sodium gluconate mcl-Pha was synthesized at the rate of 42% cell dry mass. Under highly enrich conditions, co production of polysaccharide and blends of PHB/PHA were observed. PCR base strategy was used to amplify *Pha* biosynthesis operon from chromosomal DNA. In CMG607w *Pha* biosynthesis operon has *PhaC1ZC2D* (polymerase1, depolymerase, polymerase2 and hypothetical protein) genes orientation. Conserved sequences were observed in *polymerase C1* and *C2*. All gene of *Pha* operon was cloned and sequenced. *Pha* biosynthesis operon of CMG607w has 98% homology to *Pseudomonas aeruginosa* PAO1 (AE004919). GenBank accession numbers for polyhydroxyalkanoates synthase operon nucleotide sequences are from AY596787 to AY596795.

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