

# IMCB Invited Speaker



Speaker : **Prof. Caroline S. Harwood**  
*Gerald and Lyn Grinstein Professor of Microbiology,*  
*University of Washington, USA*

Date : 18 September 2012 (Tuesday)

Time : 11:00AM - 12: 00 PM

Venue : Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Host : Prof. Lianhui Zhang

## Seminar :

### **Non-growing photosynthetic bacteria as biocatalysts for hydrogen gas production**

The anoxygenic photosynthetic bacterium *Rhodospseudomonas palustris* has potential as a biocatalyst for hydrogen gas production using its nitrogenase. Cells induced for nitrogenase and deprived of nitrogen gas catalyze the synthesis of pure hydrogen. We have developed mutants in which nitrogenase is insensitive to inhibition by ammonium, thus allowing the possibility of using agricultural and industrial waste streams as feedstocks for hydrogen production. In addition, we have determined that illuminated cells that are not growing divert a large proportion of available electrons from electron-donating compounds like acetate or thiosulfate to generate hydrogen. Energy from light drives this process and such cells do not need to use any of the electron-donating compounds that they are supplied for their own growth. *R. palustris* can survive in a starved, non-growing state and produce hydrogen gas for periods of months. Transcriptome studies and biomass determinations give some clues as to how cells manage to exist in a state of non-growth for long periods of time.

## About the Speaker :

Dr. Caroline (Carrie) Harwood received her Ph.D. in microbiology at the University of Massachusetts and completed postdoctoral work at Yale University. She has held academic appointments at Cornell University and the University of Iowa. She joined the Department of Microbiology at the University of Washington in 2005 and we elected a member of the US National Academy of Sciences in 2009.

Dr. Harwood is interested in understanding how bacteria integrate diverse environmental signals and diverse metabolic modules to function at the whole cell level. Her laboratory relies heavily on genome sequencing, mutant construction and analysis, and transcriptome analysis. Current topics of interest are bacterial starvation-survival, hydrogen production, biofilms and bacterial photosynthesis.



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