

# Beneficial Microbes: Food, Pharma, Aqua & Beverages Industry

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## Rajesh Sani

South Dakota School of Mines and Technology, USA

### An Overview of Thermophilic Bioprocessing of Solid Wastes to Biofuels

Management and complete disposal of 2G solid waste including lignocellulosic biomass is an ever increasing concern in current scenario. Available chemical and biological technologies have several shortcomings. For example, co-requirement of expensive pretreatment step, undesired synthesis of hazardous byproducts, and emission of toxic gases and effluents are few to list. Development of an ecofriendly technique which can be operated at low capital investment and produce bioenergy would be a real solution for the solid waste disposal. Thermophiles and their enzymes can play important roles in many kinds of bioprocessing. This talk will describe the limitations in existing 2G feedstock conversion technologies and possible ways to overcome those limitations using thermophiles and their enzymes. The influence of high temperatures on various existing 2G feedstock conversion processes and those that are under development, including separate hydrolysis and fermentation, simultaneous saccharification and fermentation, and extremophilic consolidated bioprocess will be discussed. Integrated decentralized thermophilic biofuel production employing hydrolytic- and fermentative-thermophiles in a single step consolidated process will also be discussed.

### Biography

Rajesh Sani is an Associate Professor in the Department of Chemical and Biological Engineering at South Dakota School of Mines and Technology, USA. His research includes extremophilic bioprocessing of lignocellulose-based renewable for biofuels and bioproducts and bioprospecting of extremophilic microorganisms for developing more efficient and cost-effective biofuel (bioenergy) production technologies. Over the past 10 years, he has been the PI or Co-PI on over \$10.5 million in funded research. He has one patent, five invention disclosures and published 50 peer-reviewed articles in high impact factor journals and has contributed in several book chapters. In addition, he has been a proposal Reviewer and Panelist for the Federal Agencies and also serves the Industrial Microbiology profession as "Biocatalysis Program Committee Member" of the Society for Industrial Microbiology and Biotechnology (SIMB), Technical Session Chair at the Annual American Institute of Chemical Engineers (AIChE) and SIMB, and is also an Associate Editor.

[Rajesh.Sani@sdsmt.edu](mailto:Rajesh.Sani@sdsmt.edu)

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