Introduction

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The Eighteenth Symposium on Biotechnology for Fuels and Chemicals continues to provide a forum for the presentation of research results and the exchange of ideas on advances in biotechnology for the production of fuels and chemicals. Although the emphasis is on utilization of renewable resources, the scope of the Symposium is broader than this and includes bioconversion of fossil fuels and syngas and the new area of conversions in nonaqueous environments; these areas were discussed in Session 5 and in a Special Topic Discussion Group at the Symposium. In addition, recent developments in bioremediation were well represented in Session 6 and in the poster session.

The Symposium involved both the development of new biological agents (such as enzymes or microbes) to carry out targeted conversions as well as bioprocess development. The first area covered improvements in enzymes as well as fundamental insights into substrate–enzyme interactions and photosynthesis. The latter area focused on converting one material into another using biological agents through combinations of chemical engineering, biological sciences, and fermentation technology. This area also refers to an overall processing involving at least one biologically catalyzed step in combination with other physical and/or chemical processing operations. Agricultural crops, such as corn and corn fiber as well as woody biomass and lignocellulosic wastes, are emphasized for process feedstocks and their pretreatment investigated.

This area is gaining increased interest as some processes are moving to commercialization. Along with continuing advances in ethanol production, both from corn and from lignocellulosics, technology for lactic acid production by fermentation processes is being improved and commercialized. Papers were also presented on other potential products including fumaric acid, succinic acid, methane, enzymes, glucuronic acid,

and biodiesel. Industrial issues and needs for commercialization were addressed in a new Session 4 that proved exciting, provocative, and well-attended. The International Energy Agency cosponsored a special discussion on "Technoeconomic Modeling of Lignocellulosic Conversion to Ethanol" during the meeting.

The papers in this volume were drawn from the 37 oral and 103 poster presentations made to the approximately 180 attendees in Gatlinburg, TN. Overall, we believe the Eighteenth Symposium continued the tradition established by its founder, Charles D. Scott, of providing both technical and informal interactions between representatives of industry, academia, and the government research laboratories during the sessions, banquets, and tours, including a tour of Oak Ridge National Laboratory.

The Eighteenth Symposium was sponsored by the U. S. Department of Energy's Biofuels Energy Systems Division and the Biological and Chemical Technology Research Program (DOE), Oak Ridge National Laboratory, National Renewable Energy Laboratory, Idaho National Laboratory, Lockheed Martin Energy Systems, Inc., A. E. Staley Manufacturing Company, Archer Daniels Midland Company, Bio-Technical Resources, L. P., Chronopol, Inc., ConAgra Grain Processing Companies, Enzyme Bio-Systems, Ltd., E. I. DuPont de Nemours and Company, Grain Processing Corporation, Raphael Katzen Associates International, Inc., Weyerhauser Company, American Chemical Society's Division of Biochemical Technology.

Organization of the Symposium was as follows:

Organizing Committee

Brian H. Davison, *Cochairman, Oak Ridge National Laboratory*
Charles E. Wyman, *Chairman, National Renewable Energy Laboratory*
Bill Apel, *Idaho National Engineering Laboratory*
Rakesh Bajpai, *University of Missouri-Columbia*
David Boron, *U. S. Department of Energy*
Ting Carlson, *Cargill, Inc.*
James A. Doncheck, *Bio-Technical Resources, L. P.*
Mark Finkelstein, *National Renewable Energy Laboratory*
Donald L. Johnson, *Grain Processing Corporation*
Raphael Katzen, *Raphael Katzen Associates International, Inc.*
Lee R. Lynd, *Dartmouth College*
Valerie Sarisky-Reed, *U. S. Department of Energy*
Jonathan Woodward, *Oak Ridge National Laboratory*

Session Chairpersons and Cochairpersons

Session 1: Thermal, Chemical, and Biological Processing
Mark T. Holtzapple, *Texas A&M University*
Robert Torget, *National Renewable Energy Laboratory*