

1. Group Leader: Prof. Dr. XU Jian Tel: 86-532-80662651

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Web: <http://www.BioenergyChina.org/fg/>

RESEARCH INTEREST

- A) Cellulosic Biofuels
- B) Algal Biofuels
- C) Metagenomics and Single-cell Genomics

2. Group Leader: Prof. Dr. LIU Tianzhong Tel: 86-532-80662735

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Research Focus

- 1. Screen of oleaginous algae strains and its evaluation;
- 2. Photobioreactor design and algal mass culture;
- 3. Bio-refinery technology of energy microalgae;
- 4. Carbondioxide fixation and utilization with microalgae for high-valued products;
- 5. Green processing of macro-algae.

3. Microbial Resources Group Prof. Dr. LI Fuli

Tel: 86-532-80662655

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Microbial Resources group specializes in screening, identifying and exploiting microbes with potential use in bioenergy production. We focus on the projects of stress tolerance mechanism of yeast, mechanism of butanol formation in Clostridia and metabolic pathways of algae lipid synthesis and the key enzymes of lipid accumulation.

4. Energy Plant Group Group Leader: Prof. Dr. ZHOU Gongke Tel: 86-532-80662732

Email: zhougk@qibebt.ac.cn

Web: <http://www.bioenergychina.org/ep/> Dr. ZHOU Gongke is a laureate of "CAS Hundred-Talents Program". His research interests mainly focus on the functional genomics analysis of the biomass formation in energy plants. He is one of the recipients of the Natural Science Award (the 2nd place) by Ministry of Education of China in 2004, and the Science and Technology Progress Prize (the 2nd place) by Gansu Province in 2002. He has published more than 48 peer-reviewed papers; most of them are published in Plant cell, Plant physiology, Plant cell physiology, Molecular Plant, BMC Plant Biology, PLoS ONE, and Phytchemistry Research Focus Biomass is of the critical importance to ascertain the sustainable sources of renewable energy; of the various biomass resources, bioenergy plants contribute the majority of biomass production worldwide.

5. Metabolomics Group Research Activities Group Leader: **Prof. Dr. CUI Qiu** Tel: 86-532-80662706 E-mail: cuiqiu@qibebt.ac.cn

The central theme of his research focuses on key features and bottlenecks in the degradation of lignocellulosic materials, such as screening and structure/function analysis of cellulosomal and noncellulosomal enzymes, rational protein engineering, and directed evolution of cellulases or designer cellulosomes, and genetic engineering of lignocellulolytic microorganism and microalgae.

6. Biosensing Group Group Leader: Prof. Dr. LIU Aihua Tel: 86-532-80662758 Email: liuah@qibebt.ac.cn

A great interest of our group is to obtain functional biomaterials with specific structures or catalytic activities by microbial engineering and protein engineering strategies. For example, we design and construct whole-cell biocatalyst by microbial (bacterium, yeast) surface display, and efficiently screen specific ligands by phage display. By integrating biomaterials with unique nanostructures, we aim at developing novel approaches, microarrays, biofuel cells and sensing devices to monitor and evaluate bioenergy process, industrial quality control, environment detection, health care, and food safety.

7. Metabolic Engineering Group Group Leader: **Prof. Dr. LU Xuefeng** Tel: 86-532-80662629 Email: lvxf@qibebt.ac.cn

Dr. LU's main research interest focuses on photosynthetic production of biofuels and biochemicals from CO₂ by genetic, enzymatic and metabolic engineering in cyanobacteria. In recent years, he published more than 20 papers in top journals such as Biotechnology Advances, Journal of American Chemical Society, Journal of Biological Chemistry, Metabolic Engineering and Energy & Environmental Sciences.

8. Enzyme Engineering Group Group Leader: Prof. Dr. LI Shengying Tel: 86-532-80662676 E-mail: lishengying@qibebt.ac.cn

Research Focus Bioengineering of biosynthetic enzymes and pathways for microbial production of biofuels; Fungal cellulases; Exploring novel biocatalysts from diverse biosynthetic systems of secondary metabolites through genome mining and biochemical characterization; Industrial strain improvement.

9. Biohydrogen and Biogas Group Group Leader: Prof. Dr. GUO Rongbo Tel: +86-532-80662708 E-mail: guorb@qibebt.ac.cn

Research Focus Our research targets are to improve biogas production efficiency, to provide solution for problem in biogas production from solid biomass, such as industrial and agricultural biomass waste or food residue, our research mainly focuses on: Hydrogen and methane production by two phase anaerobic fermentation process; Biogas production from corn straw (maize stover); Biogas production from algal biomass; Isolation of the functional microbes from community of anaerobic degradation; Dry anaerobic fermentation technology; Co-digestion of different substrates; Hydrogen production by microbial fuel cell (MFC).

10. Bio-based Chemicals Group Group Leader: Prof. Dr. XIAN Mo Tel: 86-532-80662768 E-mail: xianmo@qibebt.ac.cn
My research focuses on biosynthesis of bulk chemicals from renewable resources using biocatalysis and chemical catalysis related to creating genetic altered microbes, enzymes and chemical catalysts. 80 peer-reviewed papers have published in the journals such as JACS, PNAS, JOC.
11. Bio-inspired Polymers and Functional Materials Group Group Leader: Prof. Dr. WAN Xiaobo Tel: 86-532-80662740 Email: wanxb@qibebt.ac.cn
Research Focus Synthesis of novel organic and polymeric material for organic thin-film transistors; Developing novel synthetic methodology for organic and polymeric materials; Synthesis of bio-mimetic organic and polymeric materials for better nano-structure control and novel functions.
12. Advanced Organic Functional Materials & Devices Group Group Leader: Prof. Dr. YANG Renqing Tel: 86-532-80662700 Email: yangrq@qibebt.ac.cn
Research Focus Organic solar materials (OSCs) and device fabrication Fluorescent biosensor Organic microporous polymers
13. Thermo-chemical Conversion Group Group Leader: Prof. Dr. WU Jinhu Tel: 86-532-80662761 Email: wujh@qibebt.ac.cn
Research Focus Energy & Chemicals Related Coal/Biomass Gasification and Syn-gas Purification Syn-gas Synthesis for DME and Gasoline/Diesel Biomass Catalytic Pyrolysis & Oil Upgrading for Bio-liquid Fuel and Chemicals Biomass Torrefaction & Pelletization for Solid Fuel Biomass/Coal Based Thermo-Chemical Conversion and Multi-production System Environmental Related CO₂ Capture and Storage via BioChar CO₂ Emission Investigation in Energy Sector RDF Thermo-Chemical Conversion & Energy Utilization
14. Hydrogen Storage & Novel Nanoporous Materials Group Group Leader: Prof. Dr. ZHAO Xuebo Tel.: 86-532-80662729 Email: zhaoxb@qibebt.ac.cn
Research Focus Currently, Prof. Dr. Zhao's group mainly work at the preparation of novel nanoporous metal organic frameworks and their application in hydrogen and other gas storage and mixture gas separation. They also attempt to develop effective methods for the separation of hydrogen isotopes based on Kinetic Quantum Sieving Effect. Generally, main research field include: 1. Preparation, chracterization of novel nanoporous materials 2. Hydrogen adsorption and storage in functionalized nanoporous activated carbons and MOFs 3. Kinetic isotope effect for H₂ and D₂ quantum molecular sieving on nanoporous materials 4. Separation of pure hydrogen and deuterium gas 5. Development of novel ion liquid for hydrogen storage 6. Development of novel nanoporous membrane
15. Green Chemo-catalysis Group Group Leader: Prof. Dr. MU Xindong Tel: 86-532-80662723 E-mail: muxd@qibebt.ac.cn

Web: <http://www.greenchemcat.com/> Dr. MU is a professor of CAS-QIBEBT, where he leads the Green Chemo-catalysis Group.

The research focuses include biomass pretreatment, the effective separation and valuable utilizations of the main components of lignocellulosic biomass (i.e. cellulose, hemicellulose, and lignin) Research and development of novel catalytic processes for the efficient conversion of biomass and coal-based chemicals, which principally involves dehydration, hydrolysis, hydrogenation, etc. The design and fabrication of nano hybrid biomimetic materials and their applications in energy conversion and environmental areas, which includes: 1) Design of nanostructured biomimetic catalysts, 2) biomass-derived nano hybrid material development and their application in separation

16. Heterogeneous Catalytic Conversion Group Group Leader: Prof. Dr. LI Xuebing Tel: 86-532-80662757 E-mail: lixb@qibebt.ac.cn

His main research interest is heterogeneous catalytic conversion of substantially available raw materials to modern energy products. He is also extensively exploring the reaction mechanisms, micro-kinetics and catalytically active surface structures. In recent 5 years, Prof. LI has more than 20 publications at academic journals

17. Modeling and Simulation Group Group Leader: Prof. Dr. YAO Lishan Phone: 86-532-80662792 Email: yaols@qibebt.ac.cn

In 2010, Dr. YAO joined QIBEBT as the leader of the modeling and simulation group. 1. Enzyme catalysis Enzyme catalysis plays an essential role in life processes and biotechnology applications. Enzymes accelerate reactions by orders of magnitude through reducing the activation barrier. We are interested in understanding how enzyme structure and dynamics contribute to the catalysis by employing NMR and computational methods. 2. Protein design Protein design provides great opportunities to create novel enzymes, therapeutics and vaccines. We are interested in modifying the amino acid sequence of a protein to alter its property or function by combining the state-of-art computational method and molecular biology techniques.

18. Principle Investigator: Prof. Dr. LAN Zhenggang Tel: 86-532-80662630 Email: lanzg@qibebt.ac.cn

RESEARCH FOCUS

Photoinduced reactions play essential roles in solar energy conversions. After photo-absorptions, molecular systems can experience a series of complex reactions on electronically excited states, such as nonadiabatic transitions, vibrational relaxations, electron transfers and energy transfers. Our task is to understand various aspects of excited-state phenomena within the framework of theoretical and computational chemistry. By combining the development of theoretical methods and the simulation of various excited-state processes, we wish to understand physical mechanism of photoinduced reactions of molecular systems in the gas phase and in condensed phases, particularly key reactions relevant to solar energy conversions (photovoltaics or photosynthesis).