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The microbial world has given us many surprises including microbes that grow under extremely harsh conditions (122C at 40 MPa), novel metabolisms such as the uranium and perchlorate reduction, and novel chemicals that can be used to control diseases. We continually face new and difficult problems such as the need to transition to more carbon-neutral energy sources and to find eco-friendly chemicals and to find new drugs to treat disease. Will it be possible to tap into the seemingly limitless potential of microbial activity to solve our current and future problems? The answer to this question is probably yes. We are already looking to the microbial world to provide new energy sources, green chemicals to replace those made from petroleum, and new drugs to fight disease. To help us along these paths, we are deciphering how microorganisms interact with each other. We know that microbial populations interact and communicate with each other. The language that microbes use is chemical where small molecules are exchanged among different microbial cells. Sometimes, these chemicals suppress activities of competitors and could be used as antibiotics or may have other therapeutic uses. Other times, the chemicals stimulate complex responses in microbial populations such as fruiting body or biofilm formation. By understanding the conversation that microbes are having among themselves, e. g.



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## **Editorial Review**

### **About the Author**

Ramkrishna Sen is an Assistant Professor (Bioprocess Engineering) in the Department of Biotechnology, Indian Institute of Technology (IIT) Kharagpur, India. Before joining IIT Kharagpur, Dr. Sen served BITS, Pilani as an assistant professor and Cadila Pharmaceuticals Ltd., Ahmedabad as the Manager (R&D–Biotech). He successfully completed some industrial projects and launched modern biotechnology products. In IIT Kharagpur, he currently heads the ‘Bioprocess and Bioproduct Development’ group, consisting of 11 research scholars, 2 MTech and 2 BTech project students, who are actively involved in developing, optimizing, modeling and scaling up bioprocesses for the production and applications of marine biosurfactants, probiotics based nutraceuticals, water-repellant durable jute geotextiles and biofuels. Dr. Sen, being a biochemical engineer with industrial R&D experience had set his research priorities in broader areas of biotherapy and bioenergy. His Biosurfactant group is engaged in characterizing marine microbial surfactants for their potential commercial, healthcare (antimicrobial and anticancer) and environmental (including bioremediation and MEOR) applications. His Nutraceutical group is developing probiotic based nutraceuticals and also working on probioactive molecules like bacteriocin and antihyperglycemic EPS molecule with significant antioxidant activities (Patent Application No.: 594/KOL/2009) and industrial enzymes. Dr. Sen was also involved in developing a biofuel additive for diesel engine, which showed superior fuel properties and pollution characteristics (Patent Appl. No.: KOL /1373/2006). His group is recently involved in developing hydrophobic geotextiles, continuous processes for biodiesel production (sponsored by PfP Technology LLC., Houston, USA) and process integration for bio-ethanol (in collaboration with NEERI, Nagpur) production. Dr. Sen has international research collaborations with some foreign universities and has visited many foreign countries including USA, UK , Brazil, Portugal, Czech Republic, Malaysia, Australia, etc. He has a number of sponsored research and consultancy projects and several research/review articles and book chapters in high impact international journals and highly rated books in the field of biotechnology and biochemical engineering. He serves as a reviewer of 17 peer reviewed international journals and has edited this book being published by Landes Biosciences and Springer Science+Business Media, LLC. Dr. Sen was recently invited as one of the founding members of the recently launched Global Biorenewables (BioEnergy) Research Society (GBR Society) in Lisbon. His biography has been published in Who’s Who in Science & Engineering (2007) and Who’s Who in the World (2008).

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