

Editorial

This special issue in Process Biochemistry is dedicated to Professor Dr. Wolf-Dieter Deckwer on the occasion of his 65th birthday and his retirement as Professor for Biochemical Engineering from the Technical University of Braunschweig, Germany. I am happy to be able to collect 16 papers contributed mainly by his former students, associates or colleagues from six countries. The content of the papers ranges from environmental biotechnology over cell physiology, biochemical reaction engineering, modelling, metabolic engineering to systems biotechnology, which well reflect the research interests and activities of Wolf-Dieter Deckwer in the last 20 years.

Professor Deckwer was trained as a chemical engineer at the Technical University of Berlin where he did his Ph.D. in 1973 and achieved the Habilitation (permission for teaching in German universities) in 1975 in an unusually short time period. He was then appointed as Professor for Technical Chemistry at the University of Hanover (1976–1981) and later at the University of Oldenburg (1981–1986). His research areas in chemical engineering were among others mostly related to multiple-phase reactions and Fischer-Tropsch synthesis in bubble column reactors. His extensive experience and knowledge in these areas was summarized in his well-known monograph “Bubble Column Reactors” (1992), first published in German as “Reaktionstechnik in Blasensäulen” in 1985. To honour his achievements in reaction engineering with bubble column reactors and his retirement there was a timely international conference on bubble column reactors in May 2006 in Germany which was organized by his former student and co-worker Prof. Dr. Adrian Schumpe and for which Professor Deckwer is the honorary chairman. Although he moved to another research area twenty years ago, he is still a very much consulted expert for Fischer-Tropsch synthesis which is gaining importance again.

I came to know Professor Deckwer in 1986 when he moved to Braunschweig to become head of the Division of Biochemical Engineering at GBF (German National Research Institute for Biotechnology) and Professor of Biochemical Engineering at the Technical University of Braunschweig. I was lucky to become one of his first PhD students at the GBF. Biochemical engineering at those days at the GBF had an euphoric mood and a very stimulating atmosphere. Several research programs such as integrated bioprocess development,

metabolic engineering of microbial and animal cell cultures, environmental biotechnology and chemicals from renewable resources which are still today relevant and some of which even gain more attention (e.g. white biotechnology) were carried out at GBF’s Biochemical Engineering Division headed by Wolf-Dieter Deckwer. He emphasized always the application of (chemical) engineering principles to biological processes, especially the quantitative, model-based and systematic approaches which are important components of the “new” and popular discipline systems biology. As a “reactor-man” who studied chemical and biochemical reactions and transport phenomena in different types of reactors for many years Wolf-Dieter Deckwer was among the few leading biochemical engineers who realized the importance of considering the “cell” itself as a bioreactor and pushed studies in this direction in the early 1990’s. I still well remember his enthusiasm and his almost demanding words “go ahead” in a morning of early 1991 when we discussed about the quantification and use of intracellular activities and fluxes of the tricarboxylic acid cycle as a criterion of oxygen supply control, reactor design and scale-up of a microaerobic fermentation process. I guess, this discussion and of course also a manuscript soon on this topic helped me to get one of the only few permanent scientist positions offered in his division during the whole 1990’s. This allowed me to concentrate on research and to pursue a scientific career under very comfortable conditions. Wolf-Dieter Deckwer is very generous and lasting in supporting young scientists.

Wolf-Dieter Deckwer is always open to new development in technology and has a broad overview. At the turn of the new century he quickly realized the importance of bioinformatics and functional genomics for bioprocess analysis and development. Freed of the many administration duties at GBF by then he set out with a dedicated research group to establish tools to study proteome and fluxome of bioprocesses and cooperate with bioinformaticians to work with genome sequence and functional genomic data. He also strongly propels the integration of systems biology into bioprocess development. In this connection I would especially like to mention that Wolf-Dieter Deckwer was one of the major initiators for the successful establishment of a DFG (German Science Foundation) special research program “From gene to products” at the

Technical University of Braunschweig. In this special research programme his group is doing very productive systems biology work with *Bacillus megaterium* for the production of recombinant protein(s).

Wolf-Dieter Deckwer is not only a fruitful scientist but also a respected teacher with students all over the world. As a mentor he has a very sharp scientific judgement and but gives his students and associates enough free room to develop their own ideas and even new topics. I am sure I was not the only Ph.D. student of him, who came up with a thesis at the end which had a very different topic from what originally written in the “thesis plan” at the beginning. He judges the work merely on the scientific merit and of course also on the output (almost = publications!). With a publication list of more than 400 peer reviewed scientific papers Wolf-Dieter Deckwer still has a high “affinity” to papers and writes these days even by himself papers from theses of his

former PhD students who went to industry and therefore had no time (or interest) for publication. In fact, Wolf-Dieter Deckwer has published in the last two years more first author papers probably than he did in the last twenty years.

Wolf, I wish you all the best for your undertakings, both in science and in the new phase of your life. I know you will stay with us in science and I deeply wish many more years of collaboration with you.

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