

UNIVERSITÉ DE TECHNOLOGIE DE COMPIÈGNE

UTC

Laudatio

Laudatio

Professeur émérite

Klaus Mosbach

Département de biochimie fondamentale
et appliquée de l'Université de Lund (Suède)

Docteur Honoris Causa

de l'Université de Technologie de Compiègne

donnons un sens à l'innovation



Klaus Mosbach

Carrière académique

- Position actuelle : Senior Professor, Lund University, 2010 - présent.
- Professeur Emerite, Lund University, Suède, 1997-2010
- Professeur et co-fondateur du Département de Biotechnologie, Federal Institute of Technology, ETH, Zürich, Switzerland, 1982-1986
- Professeur de Biochimie, Lund University 1970-1997
- Professeur Associé, Lund University 1964-1970
- Docteur en Biochimie, Lund University, 1960

Fonctions

- Directeur du Center for Molecular Imprinting, Lund University
- Professeur, fondateur et Directeur de la Division of Pure and Applied Biochemistry, Lund University, Suède
- Professeur honoraire invité en biochimie, Université Catholique de Louvain, Belgique, 1995
- Professeur honoraire visiteur en biochimie, University of Bath, UK, 1993
- Professeur et co-fondateur du Département de Biotechnologie, Federal Institute of Technology, ETH, Zürich, Suisse, 1982-1986
- Professeur invité, Japanese Society for the Promotion of Science, Japon, 1978
- Professeur invité, University of Dallas, Texas, USA, 1973
- Professeur visiteur, Weizmann Institute of Science, Rehovot, Israel, 1970
- Professeur Humboldt associé au Max-Planck Institute, Munich, Allemagne, 1967
- Waksman-Merck Post-Doc Fellow, Institute of Microbiology, Rutgers University, USA, 1960-1962

Prix et distinctions (une sélection)

- MIP2010 Prize - In honor of founding the modern era of molecular imprinting, The Future of Molecular Imprinting, New Orleans, Louisiana, USA - 2010
- Martin Gold Medal du Comité exécutif de la Chromatographic Society, UK - 2000
- US National Gold Medal of Technology du Department of Commerce, USA par le Président Clinton (comme membre initial de Biogen Inc) - 1999
- Research Price du Swedish Fund for Research without Animal Experiments - 1993
- The Royal Swedish Academy of Engineering Sciences Gold Medal - 1990
- Scientific Prize en Enzyme Engineering du Engineering Foundation, NY, USA - 1985
- Scientific Prize de l'International Organization of Affinity Chromatography and Biorecognition (Pierce Prize) - 1985
- Arrhenius Medal - 1983

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Né à Leipzig, Allemagne, 26 Novembre 1932. Marié, 3 enfants

Laudatio

au **Professeur Klaus Mosbach**
par **Daniel Thomas, Professeur des Universités**

It is a great pleasure and also a great honour to hold this Laudatio at the occasion of the award of the title of a Doctor Honoris Causa by the University of Technology of Compiègne to Professor Klaus Mosbach, Senior Professor at Lund University, Sweden. This is a very special moment, not only because the person who will receive this distinction is one of the leading figures in Europe in the field of Biotechnology, but also because this title is one of the most prestigious distinctions delivered by French universities, the last time a Dr h.c. was awarded by this university dates back many years ago.

Ladies and Gentlemen, I'm now going to venture into the difficult task to present the complex personality of Professor Klaus Mosbach, whom I have had the privilege to know for many years. What is maybe the most prominent characteristics of Professor Mosbach is that he never wanted to follow a pre-defined path through his professional life, never wanted to dissolve in a crowd, or to accept any kind of dogma. His curiosity, his imagination, his persistence, his availability and his liveliness have made him one of the leading figures of his generation.

Klaus Mosbach was born in Leipzig, Germany, in 1932. His family later moved to Sweden, where he started his professional career. According to him, he was not sure in the beginning, whether to start a career as a concert pianist, or, the second option, in science. In fact, after finishing high school and working for some time in a pharmaceutical company, he discussed his future plans with the research director of the company, who had been studying music with Bela Bartok, the

famous Hungarian composer, about the chances of becoming a concert pianist. The director made him aware of the fact that a small country like Sweden might afford a maximum of three professional concert pianists. This greatly helped to finally take the decision to study natural sciences at the university. Nevertheless, Klaus Mosbach has always continued nourishing his love for music, and he is himself a pretty good pianist as I am told. The obvious choice for him at university was to study zoology because of his interest for ornithology. This was later spiked with some botany and, following his father's advice to make «the whole thing more solid», with chemistry.

Klaus Mosbach then enrolled in Ph.D. studies in the field of biochemistry, which combined the two areas, biology and chemistry. He chose as a topic symbiotic organisms, in particular lichens, that is, alga and fungus living together. In that process, stimulated by his father's work on developing various paints based on synthetic polymers, he for the first time got the idea to enclose lichen cells in a three-dimensional network of polymers, thereby keeping them alive and productive. This was back in 1966. The same he did with an enzyme, which he isolated from lichen. The general advantage of the approach is that the cells/enzymes are kept bound in the surrounding polymer and can be freely accessed by substrate and product via diffusion or forced convection. This was the beginning of his interest in the immobilization of cells and enzymes. Many other well-known scientists like Katchalski-Katzir from Israel, Chibata and Fukui from Japan, and myself at Compiègne University followed related approaches, and the area eventually developed into what we today call enzyme technology, an area of both industrial and medicinal interest.

The other major line of research that was developed in parallel in Klaus Mosbach's laboratory today is known as affinity chromatography and biomolecular recognition. As he found the aforementioned enzyme isolation to be a big hassle, he asked himself the question whether there wasn't a faster and more direct way of doing this. Having learned how to immobilize enzymes onto solid supports, he conceived the idea of first immobilizing a substrate or inhibitor of that enzyme to a matrix, which would then allow binding of that

particular enzyme specifically to its inhibitor. This technology has developed into the probably most widely used procedure to purify bio-molecules. Again, many well-known scientists have been active in this area, like Wilchek, Cuatrecasas, Anfinsen, Porath, and at UTC, Professor Vijayalakshmi. As a sideline of this work, he also looked into an area that is today known as biosensor technology, and more specifically developed the enzyme thermistor.

The general idea and know-how underlying the two areas, immobilization and in particular entrapment of cells and enzymes, and the understanding of the various bio-recognition events gained from affinity chromatography studies, made Klaus Mosbach think of the possibility of combining the two. The question emerged as to what would happen if an encapsulated molecule could be removed from the polymer matrix. Would this leave behind cavities of approximately the same shape and size as the originally bound molecule? If so, could these cavities later serve as specific binding sites to rebind the said molecule? This led to his current major area of scientific interest, the technology called molecular imprinting. Being one of the two fathers in this rapidly developing field, Klaus Mosbach has been the first to demonstrate, in 1993, that molecularly imprinted polymers can be used as synthetic antibodies, also called Plastic Antibodies, in immunoassays. This has given a great boost to the technology and has made it develop into a self-standing research area with many research groups involved all over the World. Again, one of the leading labs in the field is located at Compiègne University, the lab of Professor Haupt. In fact, as you may have realised, Klaus Mosbach's research in the field of Biotechnology has inspired or boosted the development of many similar activities at the University of Technology of Compiègne, which is one of the reasons why we have suggested to award him this title of a Doctor Honoris Causa of this university.

Although Professor Mosbach has spent the largest part of his scientific life at Lund University in Sweden, which he joined as a young associate professor in 1964 and where he is holding the position of a Senior Professor still today, he has also occupied positions at other universities. In particular, he has

founded the Department of Biotechnology at the prestigious Federal Institute of Technology in Zürich, Switzerland, in 1982, and has been its director for several years. In addition, he has been a visiting professor in famous institutions like the Weizmann Institute of Science in Israel, the University of Dallas, Texas, the University of Bath in the UK, and the Université Catholique de Louvain, Belgium. Klaus Mosbach has also been collaborating with numerous companies over the years, including Biogen, Hybritech, Eli Lilly, Igen, Hofmann la Roche. He has also founded his own company, Bioswede, and is holding numerous patents.

For his achievements, he has received many important distinctions, like the Martin Gold Medal from the Chromatographic Society, UK, the US National Gold Medal of Technology from the Department of Commerce, USA, presented by President Clinton, the Research Price from the Swedish Fund for Research without Animal Experiments, The Royal Swedish Academy of Engineering Sciences Gold Medal, the Prize in Enzyme Engineering from the Engineering Foundation, USA, the Pierce Prize on Affinity Chromatography and Biorecognition, the Arrhenius Medal, and others.

However, one of Klaus Mosbach's main achievements is that he has been able to pass on his expertise and know-how to fellow scientists and future generations. He has published several volumes of the prestigious series Methods in Enzymology, together with many other books, book chapters and a very large number of research papers. More importantly, he has created a «school» - indeed, many of his former Ph.D. students and post-docs are today university professors or company leaders all over the World.

I will finish by underlining once more that Professor Klaus Mosbach is a great visionary, one of the scientists who have had a determining impact onto an entire research field, that of Biotechnology, which he both has inspired from a fundamental research point of view, and boosted in terms of applied research and valorisation. Moreover, owing to his charismatic personality, he has inspired future generations on a much broader level, well beyond science.

Programme

Discours d'Alain Storck

Président de l'UTC

Intermède musical

Honneur et remerciements au

Professeur émérite Klaus Mosbach

du Département de biochimie fondamentale
et appliquée de l'Université de Lund (Suède)

Intermède musical

Discours de clôture par Bernard Beignier

Recteur de l'académie d'Amiens

Chancelier des universités

Cocktail

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