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# CONFERENCE REPORT

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## Celebrating Dieter Seebach's Contributions to Science: A Bitter Sweet Occasion?

**Frontiers in Chemistry:  
The Spring Meeting 2004 of the Swiss Chemical Society,  
March 26 2004, ETH Hönggerberg, Zürich**

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**Abstract:** The 2004 Spring Meeting of the Swiss Chemical Society played host to a one-day symposium reflecting on Prof. Dieter Seebach's impact on modern day chemistry. A broad cross-section of science was discussed by the four speakers: Jean-Marie Lehn; Christopher T. Walsh; David A. Evans; and Peter B. Dervan, mirroring in some small way the diversity of Dieter Seebach's own research during the past 40 years.

**Keywords:** Aldol reaction · Antibiotics · DNA recognition · Self-organisation · Umpolung

The 2004 Spring Meeting of the Swiss Chemical Society had special significance this year. Professor *Dieter Seebach*'s tenure at the Laboratorium für Organische Chemie at ETH Zürich took on a new form in April last year when he was 'promoted' to the retirement floor of the new Hönggerberg building, under the new title of professor *emeritus*. It was, however, not the purpose of the meeting to mourn this event, but instead to celebrate his far-reaching contributions to science and in particular to chemistry. Indeed, the variety of work discussed by the four invited speakers appropriately mirrored the diversity of *Seebach*'s own re-

search interests over the years – from methodology and natural product synthesis to structural and supramolecular chemistry (with a biological angle often thrown in for good measure) [1][2]. Professor *Seebach* has enjoyed an illustrious career, highlighted by the 750-odd original publications bearing his name [3]. This prolific reporting of high quality research, much of which has appeared in the home-grown journal *Helvetica Chimica Acta*, justifies his presence on the ISI HighlyCited.com™ list of the 250 most cited researchers. A word synonymous with *Dieter Seebach*, 'umpolung', is now officially recognised in the scientific community, although *Donald Hilvert* (ETH Zürich) pointed out that in the English language "it is rarely pronounced correctly" [4]! More recently, the term *frustrates* was coined to emphasise the unpredictable properties of fluorine [5]. Despite this he remains reluctant to adopt commonly used (and arguably ambiguous) phrases such as 'chiral HPLC', preferring a more verbose description of a system that permits the separation of enantiomers: 'HPLC on a column

equipped with a chiral stationary phase'. It is his sharp attention to detail that concerns anyone discussing chemistry in his presence, but equally he instils a great deal of respect. As *Doktorvater* to 147 PhD students (with the last one in the making), he is a prolific 'parent'. His teachings and love of chemistry have been bestowed on countless co-workers over the years and, more importantly, will continue to be. Far from accepting with open arms the two promises of retirement – countless hours pottering in the garden and playing golf – *Dieter Seebach* continues to pursue his true passion: *chemistry*.

The meeting took place on an unusually sunny day in Zürich at the Hönggerberg campus of ETH. Co-organisers of the event, *Donald Hilvert* and *Erick M. Carreira* (ETH Zürich) should be praised for their foresight in starting the symposium at 10 am, thereby allowing for some early morning respite. The rumours of free coffee and gipfeli before the official start ensured a good turn out from the outset, in fact it wasn't long before the 'standing room on-

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A captivated audience: Jean-Marie Lehn at the helm

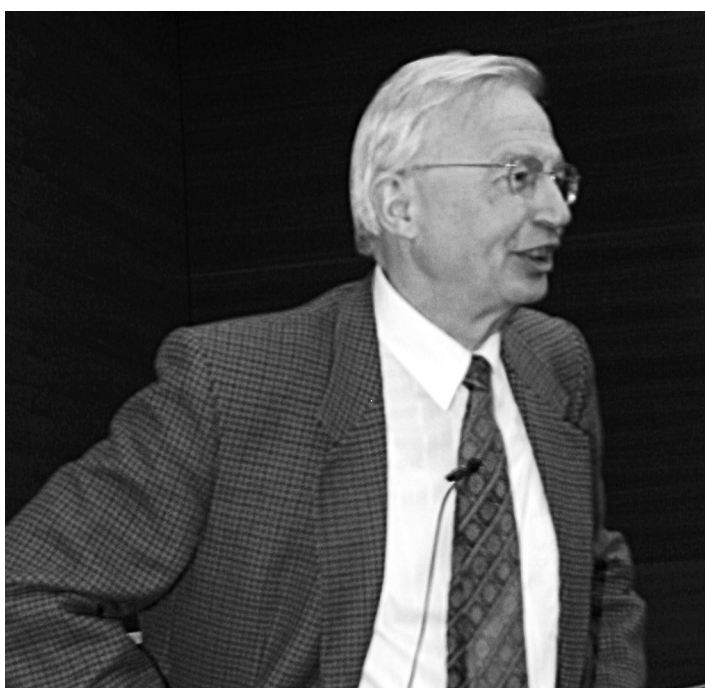
ly' scenario commenced. However, no-one was disappointed by the events of the day, which after a brief introduction by *Donald Hilvert*, were started by the Nobel Laureate *Jean-Marie Lehn* from the Université Louis Pasteur Strasbourg (France). As one of *Seebach's* 'oldest' friends, describing him as a "monument to organic chemistry", which was quickly rephrased to a "living monument...", *Lehn* gave a personal recollection of *Seebach* before commencing his lecture, entitled 'Self-Organisation by Design and by Selection' [6]. This provided the basis for an enthralling discussion on the assembly of supramolecular structures, an area of research closely related to *Seebach's* current interests on the structural properties of  $\beta$ -peptides (oligomers of homologated  $\alpha$ -amino acids) [7]. During the course of his lecture, *Lehn* explained how spontaneous formation of helices and other well-defined structures from simple molecular building blocks can be initiated by the

presence of transition metal ions – so-called metallosupramolecular chemistry.

A brief interlude followed, during which *André Merbach* (President SCS) presented the prizes and distinctions conferred by the Swiss Chemical Society [8]. The *Dr.-Max-Lüthi* medal went to *Cédric Clivaz* (University of Applied Sciences, Bürgdorf) in recognition of his diploma thesis 'Evaluation and Application of a Method to Investigate the Kinetics of Adsorption of Albumin on Calcium Oxalate'. Since *Clivaz* was unable to attend the meeting *Ruth Weber*, head of the Department of Chemistry, accepted the medal and award of CHF 1,000.– on his behalf. The highly coveted *Sandmeyer Prize* of CHF 20,000.– and a medal was presented to the research team of *Bernd Herzog*, *Dietmar Hügli*, *Hermut Luther*, *Elek Borsos*, and *Albert Stehlin*, who have developed two new and innovative high-performance UV absorbers for cosmetic sunscreens at Ciba Speciality Chemicals. A rare honour was be-

stowed upon two professors *emeriti* of ETH Zürich, *Jack D. Dunitz* and *Dieter Seebach*: both became honorary members of the Swiss Chemical Society. The subsequent free subscription aside, in accepting the certificate *Seebach* explained how his first collaboration after arriving at the ETH in 1977 was with *Dunitz* on the structure of organolithium compounds [9][10]. Appropriately, they now occupy neighbouring offices on the retirement floor!

The second lecture of the day, entitled 'Glycosyl Transferases in the Maturation and Tailoring of Antibiotics', was given by *Christopher T. Walsh* from the Harvard Medical School (US) [11]. A leading expert in enzymology, *Walsh* explained how in recent years the differences between his views and *Seebach's* on the direction of chemical research have decreased: the *Seebach Group's* research interests are no longer confined to the realm of traditional organic synthesis, but recognise the "chem-



Presenting some pretty pictures of supramolecules: Jean-Marie Lehn



Jack Dunitz and Dieter Seebach accepting their honorary memberships of the SCS from André Merbach.





A thoughtful Christopher Walsh during his lecture



David Evans: The master builder of complex molecules

ical logic of Nature". *Walsh's* lecture outlined key features in the biosynthetic pathways that result in glycopeptide antibiotics, such as vancomycin. This information enhances our understanding of bacterial resistance and permits access to novel derivatives through strategic manipulations to the biological assembly process.

The afternoon session was chaired by *Erick M. Carreira*, who introduced the third speaker, *David A. Evans* from Harvard University (US). Having paid tribute to *Inge Seebach's* culinary skills from the night before (no reference was made, however, to *Seebach's* 'modest' wine collection), he summed up *Seebach's* presence: "(He) casts a very big shadow". *Evans' talk*, which was initially entitled 'Studies in Asymmetric Synthesis' and was subsequently altered over lunch to address the so-called 'Oxidation State Issue', provided the backdrop for an educational appraisal of the problems associated with oxygenation patterns in natural product synthesis, drawing on examples from his own laboratories [12]. *Evans* rationalised that in embarking on the synthesis of complex molecules, care should be taken to minimise late-stage manipulations to oxygenated functional groups. The key role of the aldol reaction in achieving such a goal was finely demonstrated.

The final lecture of the day was provided by *Peter B. Dervan* from the California Institute of Technology (Caltech, US). He likened *Seebach's* new career position to a person who had been driving full speed at 180 km/h (naturally in a Mercedes-Benz) before being slapped with a (65th birthday) speeding fine. It is doubtful whether *See-*

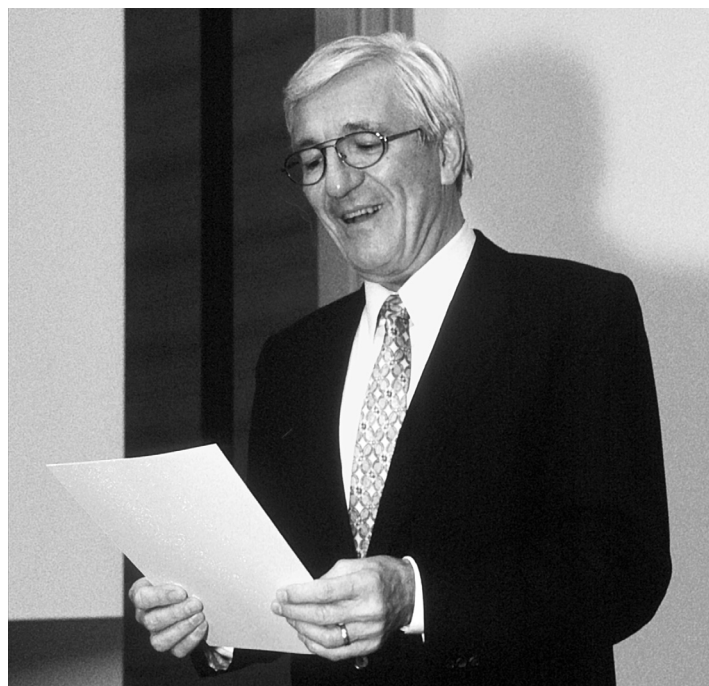
*bach* will adhere to suggestions to now slow down: several speakers suggested that 15 publications a year would be more than satisfactory! *Dervan's* lecture, entitled 'Molecular Recognition of DNA by Small Molecules', provided an insight into a cutting-edge area of current research [13]. Here, he discussed the design of small molecules such as polyamides which, by distinguishing between the four Watson-Crick base pairs, can bring about sequence-specific recognition of DNA. This research underpins the prospect for new medicines

through so-called transcription therapy.

In the closing remarks, *Dieter Seebach* offered personal recollections of the speakers. In 1965, whilst at Harvard University with *E.J. Corey*, *Seebach* first met *Jean-Marie Lehn*, who tried (unsuccessfully) to tempt him to Strasbourg. At the same time, *Christopher Walsh* was a final year undergraduate student at Harvard. Later the two were drawn closer together by *Seebach's* work on poly(hydroxybutyrates) [14]. The paths of *Seebach* and *David Evans* (who pointed out that he is *only* three years *See-*



Full of enthusiasm: Peter Dervan presenting his research



A symposium in his honour: Dieter Seebach

*bach's* junior – another symposium approaching?!) crossed in 1974 whilst *Evans* was at UCLA and *Seebach* on a sabbatical to Caltech. It was at this latter institution, at more or less the same time that *Peter Dervan* became acquainted with *Seebach*. Ever since these early days, this ‘Famous Five’ have remained close friends.

To mark his ‘retirement’, *Seebach* was given a collection of publications arising from the independent research of former co-workers. This six volume *Acta Discipulorum* was presented to him by a delegation of past colleagues at the end of the symposium.

Longevity at ETH Zürich has become a trend. Surely it will not be long before a further report appears paying homage to another milestone in *Seebach's* life.

Sincere thanks are due to the hard working organisers of this event, to the Swiss Chemical Society and the various financial sponsors for making this symposium a great success and a tribute to Prof. *Dieter Seebach*. On behalf of all the attendees and your co-workers past, present and future, we wish you, *DS*, continued success for the future.

#### Acknowledgements

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In depth: Christopher Walsh and Dieter Seebach discussing (chemistry?!)



Dieter Seebach and his colleague of 36 years, Albert Beck. Between them are copies of *Acta Discipulorum*, a collection of publications from the independent research of past co-workers.

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