

(Centre Suisse d'Electronique et de Microtechnique SA) including the former group of Paul-Scherrer Institute Zürich; the group of Applied Physics, University of Geneva; Pharmaceutical Chemistry, Department of Pharmacy ETHZ; Institute of Biomedical Engineering ETHZ; Institute for Robotics ETHZ; Institute of Animal Nutrition, University of Zürich. We also enjoy fruitful collaborations with governmental institutions such as the FAM (Forschungsanstalt für Milchwirtschaft) and the BVET (Bundesamt für Veterinärmedizin).

CCS works autonomously in collaboration with industry and companies. Salaries, running costs, and investments are entirely financed by collaborations and specific project funds. Support from collaborating companies (see homepage), from collaborating institutes and engineering schools as well as from the *Swiss Commission for Technology and Innovation* (KTI) and the *Swiss National Foundation* (NF) is gratefully acknowledged.

Received: July 28, 1997

- [1] a) W. Göpel, J. Hesse, J.N. Zemel, 'Chemical and Biochemical Sensors', VCH Verlagsgesellschaft, Weinheim, 1991/92, Vols 2/3; b) various authors, *Sens. Actuators, B* **1997**, 38/39; *ibid.* **1995**, 29/30; *ibid.* **1993**, 11; c) J.F. Liebmann, A. Greenberg, 'Environmental Influences and Recognition in Enzyme Chemistry', VCH Verlagsgesellschaft, Weinheim, 1988; d) M. Vanderlaan, L.H. Stanker, B.E. Watkins, D.W. Roberts, 'Immunoassays for Trace Analysis' American Chemical Society, Washington, 1990; e) P.G. Edelman, J. Wang, 'Biosensors and Chemical Sensors', American Chemical Society, Atlanta, 1992. f) F.W. Scheller, F. Schubert, J. Fedrowitz, 'Frontiers in Biosensors', Birkhäuser, Basel, 1997, Vol. I and II; g) R.F. Taylor, J.S. Schultz, 'Chemical Sensors and Biological Sensors', IOP Publ. Comp., Bristol, 1996.
- [2] a) U.E. Spichiger, 'Chemical Sensors and Biosensors for Medical and Biological Applications', VCH-Wiley, Weinheim (in press); b) O.S. Wolfbeis, 'Fiber Optical Chemical Sensors and Biosensors', CRC-Press, Boca Raton, 1991, Vol. I and II; c) J. Wang, 'Electroanalytical Techniques in Clinical Chemistry and Laboratory Medicine', VCH Publishers, Weinheim, 1988.
- [3] a) W. Lukosz, *Sens. Actuators, B* **1995**, 29, 37; b) K. Tiefenthaler, ASI AG, CH-8050 Zürich; c) A.J. Killard, B. Deasy, R. O'Kennedy, M.R. Smith, *Trends Anal. Chem.* **1995**, 14, 257; d) B. Liedberg, C. Nylander, I. Lundström, *Biosens. Bioelectron.* **1995**, 10, p. i; d) Pharmacia Biotech, Uppsala, Sweden.
- [4] a) R.F. Taylor, in [1g], p. 553; b) G.W. Schanz, 'Jahrbuch der Sensortechnik 1995/1996', Oldenburg, München, 1995.
- [5] Enzyme Nomenclature. Recommendations (1978) of the Nomenclature Committee of the International Union of Biochemistry. Academic Press, New York, 1979.
- [6] Blood Glucose Testing System Exac Tech, Medisense, Inc., Waltham, MA 02154.
- [7] C. Demuth, Swiss Federal Institute of Technology Zürich (ETHZ), Ph.D. thesis (in preparation).
- [8] W.D. Cornell, P. Cieplak, C.I. Bayly, I.R. Gould, K.M. Merz, Jr., D.M. Ferguson, D.C. Spellmeyer, T. Fox, J.W. Caldwell, P.A. Kollman, *J. Am. Chem. Soc.* **1995**, 117, 5179.
- [9] H.-D. Höltje, G. Folkers, 'Molecular Modeling', in 'Methods and Principles in Medicinal Chemistry', Eds R. Mannhold, H. Kubinyi, and H. Timmerman, VCH Verlagsgesellschaft, Weinheim, 1997, Vol. 5. see in [1] and [2].
- [10] see in [1] and [2].
- [11] R.F. Rekker, F. Mannhold, 'Calculation of Drug Lipophilicity', VCH Verlagsgesellschaft, Weinheim, 1995.
- [12] a) J.P. Müller, Swiss Federal Institute of Technology Zürich (ETHZ), Ph.D. thesis (in preparation); b) J.P. Müller, 'Entwicklung eines phosphatsensitiven bienzymatischen-amprometrischen Biosensors', diploma work, ETHZ, 1994; c) U. Korell U.E. Spichiger, *Anal. Chem.* **1994**, 66, 510; *Electroanalysis* **1994**, 6, 305; *ibid.* **1993**, 5, 869.
- [13] G.J. Mohr, F. Lehmann, U.-W. Grummt, U.E. Spichiger, *Anal. Chim. Acta* **1997**, 344, 215.
- [14] Swiss patent application Nr. 64/97, 'Modulares Sensorsystem für die Prozess-Messtechnik', January 14, 1997; J. Spichiger, J. Müller, U.E. Spichiger, *Chem. Rundschau* **1997**, 3, Seiten F&E; U.E. Spichiger, *Bio-world* **1997**, 4, 4; U.E. Spichiger, *Technische Rundschau*, HdA **1997/98**, 32.
- [15] U.E. Spichiger, E. Vaillo, European patent application 95890187,8-1219, 'Verfahren und Schichtstruktur zur Bestimmung einer Substanz', 1997.

Chimia 51 (1997) 793-794
© Neue Schweizerische Chemische Gesellschaft
ISSN 0009-4293

Le Centre de Compétence en Chimie et Toxicologie Analytiques. The Centre of Competence in Analytic Chemistry and Toxicology (CCCTA)

Jean-Luc Veuthey*

Abstract. This article presents concisely activities, goals and members of the Centre of Competence in Analytical Chemistry and Toxicology which was created recently in the Lake Geneva region.

1. Introduction

The Centre of Competence in Analytic Chemistry and Toxicology (CCCTA) was created on June 24, 1997 in Geneva, Switzerland. Today, it groups a dozen laboratories or institutes of the Lake Geneva

region involved in the analysis of drugs and medicines. The CCCTA is recognised from an administrative point of view by the different departments, universities and hospitals in charge of the laboratories. Members of the CCCTA have recently been appointed as the national reference

Correspondence: Prof. J.-L. Veuthey
Laboratory of Pharmaceutical Analytical Chemistry
University of Geneva
Bd d'Yvoy 20
CH-1211 Genève 4
Tel.: +41 22 702 63 36
Fax: +41 22 781 51 93
E-Mail: Jean-Luc.Veuthey@pharm.unige.ch

(Centre Suisse d'Electronique et de Microtechnique SA) including the former group of Paul-Scherrer Institute Zürich; the group of Applied Physics, University of Geneva; Pharmaceutical Chemistry, Department of Pharmacy ETHZ; Institute of Biomedical Engineering ETHZ; Institute for Robotics ETHZ; Institute of Animal Nutrition, University of Zürich. We also enjoy fruitful collaborations with governmental institutions such as the FAM (Forschungsanstalt für Milchwirtschaft) and the BVET (Bundesamt für Veterinärmedizin).

CCS works autonomously in collaboration with industry and companies. Salaries, running costs, and investments are entirely financed by collaborations and specific project funds. Support from collaborating companies (see homepage), from collaborating institutes and engineering schools as well as from the *Swiss Commission for Technology and Innovation* (KTI) and the *Swiss National Foundation* (NF) is gratefully acknowledged.

Received: July 28, 1997

- [1] a) W. Göpel, J. Hesse, J.N. Zemel, 'Chemical and Biochemical Sensors', VCH Verlagsgesellschaft, Weinheim, 1991/92, Vols 2/3; b) various authors, *Sens. Actuators, B* **1997**, 38/39; *ibid.* **1995**, 29/30; *ibid.* **1993**, 11; c) J.F. Liebmann, A. Greenberg, 'Environmental Influences and Recognition in Enzyme Chemistry', VCH Verlagsgesellschaft, Weinheim, 1988; d) M. Vanderlaan, L.H. Stanker, B.E. Watkins, D.W. Roberts, 'Immunoassays for Trace Analysis' American Chemical Society, Washington, 1990; e) P.G. Edelman, J. Wang, 'Biosensors and Chemical Sensors', American Chemical Society, Atlanta, 1992. f) F.W. Scheller, F. Schubert, J. Fedrowitz, 'Frontiers in Biosensors', Birkhäuser, Basel, 1997, Vol. I and II; g) R.F. Taylor, J.S. Schultz, 'Chemical Sensors and Biological Sensors', IOP Publ. Comp., Bristol, 1996.
- [2] a) U.E. Spichiger, 'Chemical Sensors and Biosensors for Medical and Biological Applications', VCH-Wiley, Weinheim (in press); b) O.S. Wolfbeis, 'Fiber Optical Chemical Sensors and Biosensors', CRC-Press, Boca Raton, 1991, Vol. I and II; c) J. Wang, 'Electroanalytical Techniques in Clinical Chemistry and Laboratory Medicine', VCH Publishers, Weinheim, 1988.
- [3] a) W. Lukosz, *Sens. Actuators, B* **1995**, 29, 37; b) K. Tiefenthaler, ASI AG, CH-8050 Zürich; c) A.J. Killard, B. Deasy, R. O'Kennedy, M.R. Smith, *Trends Anal. Chem.* **1995**, 14, 257; d) B. Liedberg, C. Nylander, I. Lundström, *Biosens. Bioelectron.* **1995**, 10, p. i; d) Pharmacia Biotech, Uppsala, Sweden.
- [4] a) R.F. Taylor, in [1g], p. 553; b) G.W. Schanz, 'Jahrbuch der Sensortechnik 1995/1996', Oldenburg, München, 1995.
- [5] Enzyme Nomenclature. Recommendations (1978) of the Nomenclature Committee of the International Union of Biochemistry. Academic Press, New York, 1979.
- [6] Blood Glucose Testing System Exac Tech, Medisense, Inc., Waltham, MA 02154.
- [7] C. Demuth, Swiss Federal Institute of Technology Zürich (ETHZ), Ph.D. thesis (in preparation).
- [8] W.D. Cornell, P. Cieplak, C.I. Bayly, I.R. Gould, K.M. Merz, Jr., D.M. Ferguson, D.C. Spellmeyer, T. Fox, J.W. Caldwell, P.A. Kollman, *J. Am. Chem. Soc.* **1995**, 117, 5179.
- [9] H.-D. Höltje, G. Folkers, 'Molecular Modeling', in 'Methods and Principles in Medicinal Chemistry', Eds R. Mannhold, H. Kubinyi, and H. Timmerman, VCH Verlagsgesellschaft, Weinheim, 1997, Vol. 5. see in [1] and [2].
- [10] see in [1] and [2].
- [11] R.F. Rekker, F. Mannhold, 'Calculation of Drug Lipophilicity', VCH Verlagsgesellschaft, Weinheim, 1995.
- [12] a) J.P. Müller, Swiss Federal Institute of Technology Zürich (ETHZ), Ph.D. thesis (in preparation); b) J.P. Müller, 'Entwicklung eines phosphatsensitiven bienzymatischen-amprometrischen Biosensors', diploma work, ETHZ, 1994; c) U. Korell U.E. Spichiger, *Anal. Chem.* **1994**, 66, 510; *Electroanalysis* **1994**, 6, 305; *ibid.* **1993**, 5, 869.
- [13] G.J. Mohr, F. Lehmann, U.-W. Grummt, U.E. Spichiger, *Anal. Chim. Acta* **1997**, 344, 215.
- [14] Swiss patent application Nr. 64/97, 'Modulares Sensorsystem für die Prozess-Messtechnik', January 14, 1997; J. Spichiger, J. Müller, U.E. Spichiger, *Chem. Rundschau* **1997**, 3, Seiten F&E; U.E. Spichiger, *Bioworld* **1997**, 4, 4; U.E. Spichiger, *Technische Rundschau*, HdA **1997/98**, 32.
- [15] U.E. Spichiger, E. Vaillo, European patent application 95890187,8-1219, 'Verfahren und Schichtstruktur zur Bestimmung einer Substanz', 1997.

Chimia 51 (1997) 793-794
© Neue Schweizerische Chemische Gesellschaft
ISSN 0009-4293

Le Centre de Compétence en Chimie et Toxicologie Analytiques. The Centre of Competence in Analytic Chemistry and Toxicology (CCCTA)

Jean-Luc Veuthey*

Abstract. This article presents concisely activities, goals and members of the Centre of Competence in Analytical Chemistry and Toxicology which was created recently in the Lake Geneva region.

1. Introduction

The Centre of Competence in Analytic Chemistry and Toxicology (CCCTA) was created on June 24, 1997 in Geneva, Switzerland. Today, it groups a dozen laboratories or institutes of the Lake Geneva

region involved in the analysis of drugs and medicines. The CCCTA is recognised from an administrative point of view by the different departments, universities and hospitals in charge of the laboratories. Members of the CCCTA have recently been appointed as the national reference

Correspondence: Prof. J.-L. Veuthey
Laboratory of Pharmaceutical Analytical Chemistry
University of Geneva
Bd d'Yvoy 20
CH-1211 Genève 4
Tel.: +41 22 702 63 36
Fax: +41 22 781 51 93
E-Mail: Jean-Luc.Veuthey@pharm.unige.ch

laboratory for drugs, narcotics, and their precursors by the Federal Office of Public Health (OFSP).

The partners of this Centre have, as a basic objective, the improvement and the circulation of scientific knowledge in both analytical chemistry and toxicology, as well as the development of analytical methods for the quantitative measurement and the identification of different analytes (active principle, metabolites, excipients, *etc.*) present in biological matrices (blood, hair, plants, *etc.*) or in pharmaceutical forms (tablets, sterile solutions, *etc.*). In this prospect, the objectives of the Centre are numerous and are reported in *Table 1*. This article briefly presents the synergy elaborated between the laboratories and the institutes of the CCCTA.

2. Members and Objectives of the CCCTA

Analytical chemistry is important, and even essential, for the laboratories and institutes of different backgrounds which make up the CCCTA (*Table 2*). Indeed, the CCCTA laboratories analyse together hundred of thousands of samples each year from laboratories of clinical chemistry in hospitals, of legal medicine institutes, of the cantonal chemist, of therapeutic follow-up and clinical psychopharmacology units. These laboratories are not only working with the most effective and reliable analytic methods but are also constantly engaged in the research and development of analytic techniques which enable them to cope with the new requirements imposed (*i.e.*, increased sensitivity, validation in accordance with more and more severe criteria, efficient quality control, ...). These tasks can be dealt with thanks to a close collaboration between all the members of the Centre.

University laboratories are more involved than regular laboratories in the development of new techniques. Indeed, considering their academic duties, the main objective of university laboratories is the research and development of analytical methods. Therefore, the laboratories of Lausanne and Geneva universities provide a research development in pharmaceutical analysis and phytochemistry which is well recognised on the international scene. An important synergy is thus created between academic and professional circles which helps to create and maintain a high level in analytical chemistry in French-speaking Switzerland.

Finally, in view of new international regulations and in order to provide a serv-

Table 1. Objectives of the CCCTA

- to intensify collaboration between member laboratories
- to improve the exchange of know-how and skills between members
- to improve and standardize the quality of the laboratories involved in the implementation of accreditations recognised by international organisms
- to run joint research programs (diploma, doctoral theses, national and international projects, *etc.*)
- to intensify collaboration between science and medicine faculties in universities, as well as collaboration between universities and institutes or private or public organisms
- to make known to the public the development of analytical chemistry at the regional, national and international levels
- to initiate cross-border collaboration
- to organize conferences, seminars and symposia
- to develop a training program for researchers, students, practitioners and technicians

Table 2. List of the CCCTA Members

Institute or laboratory	Address	Person in charge
Centre Suisse du Contrôle de Qualité	HUG, 1211 Genève 14	Dr. A. Deom
Chimiste Cantonal du Canton de Genève	22, quai Ernest-Ansermet 1211 Genève 4	Dr. C. Corvi
Institut d'Analyse Pharmaceutique	Université de Lausanne 1015 Dorigny	Prof. U. Kesselring
Institut de Pharmacognosie et Phytochimie	Université de Lausanne 1015 Dorigny	Prof. K. Hostettmann
Institut Universitaire de Médecine Légale	CMU 1211 Genève 4	Prof. T.W. Harding Dr. C. Staub
Institut Universitaire de Médecine Légale	21 rue du Bugnon 1005 Lausanne	Prof. P. Mangin
Laboratoire Central de Chimie Clinique	CHUV 1011 Lausanne	Prof. C. Bachmann
Laboratoire Central de Chimie Clinique	HUG 1211 Genève 14	Prof. D. Hochstrasser M. M. Fathi
Laboratoire de Chimie Analytique Pharmaceutique	Université de Genève, Sciences II, 1211 Genève 4	Prof. J-L. Veuthey
Unité de Biochimie et Psychopharmacologie Clinique	Hôpitaux de Cery 1008 Prilly	Prof. P. Baumann Dr. C.B. Eap
Laboratoire Suisse d'Analyse du dopage	21 rue du Bugnon 1005 Lausanne	Dr. L. Rivier
Unité de Monitoring Thérapeutique	Institution universitaire de Belle-Idée, 1225 Chêne-Bourg	Dr. E.A. Ballant-Gorgia

ice of quality, most of the members of the Centre are working for the implementation of an accreditation process (standards EN 45000 or equivalent).

More information regarding the running of the Centre, and the involved labo-

ratories and institutes, as well as the analyses and the research they are doing, is available on the Web at:
<http://expasy2.hcuge.ch/cccta>.