

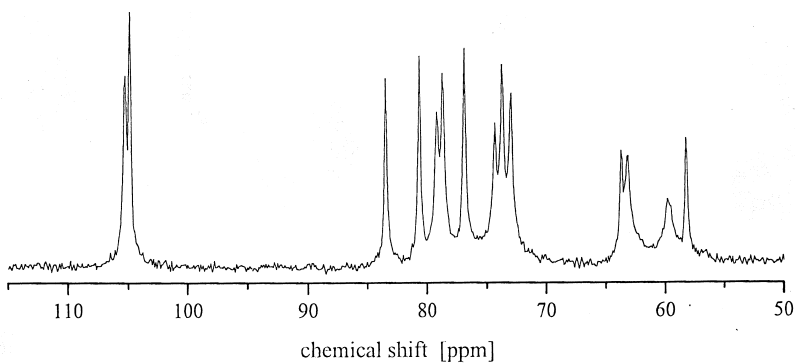
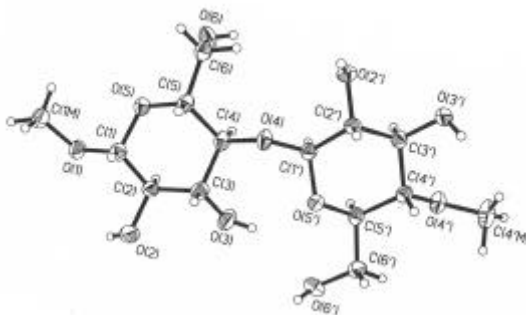
Report

1998-2000



Institute of Chemistry

University of Agricultural Sciences
Muthgasse 18, 1190 Vienna, Austria



CONTENTS

Preface	2
Organigram	4
Personnel	5
Lectures and Practical Courses	8
Doctoral and Diploma Theses	10
Research Activities	20
Scientific Projects	26
Cooperation Partners	33
Publications	36
Scientific Presentations	50
External Activities	72
Research Activities Abroad	72
External Teaching Activities	73
Habilitation Theses	73
Awards	73
Visiting Professor	74
Invited Speakers	74
Scientific Events	76
Other External Activities of the Members of the Institute	77
Acknowledgements	78
Impressum	79

The cover displays the crystal structure and ^{13}C CPMAS spectrum of a synthetic cellulose model compound.

Preface

The present Institute Report 1998 – 2000 encompasses a description of our activities over the past three years. It also reflects, not only the consequences of the rapid changes, at institute and university level, resulting from recent changes in legislation (i.e. the University Organisation Law – UOG 93, implemented by the BOKU in 1996, and University Study Law – UniStG 1997), but also the fruitful development of the individual members of our institute.

Amongst our staff members Erika Staudacher and Christian Obinger successfully acquired their habilitation and were appointed associate professors for Biochemistry (Ao. Univ. Prof.).

On the other hand, other careers came to an end: three key members of our institute retired, who had guided many generations of students: Renate Riedling who was our secretary for more than 30 years; Juliane Paschinger who devoted herself for more than 30 years to the education of students; and Robert Ebermann who was active in teaching and research for 42 years. Also, during 2000, the teaching contract of Guest Professor Frank Unger terminated after the maximum time of seven years. His duties for the degree course of agriculture were taken up by Erika Staudacher, Christian Obinger and Thomas Rosenau.

Leopold März was re-elected rector of BOKU for the period of 1999 – 2003. The translation of UOG93 into practical university life by him and his team continuously makes things easier and better for all institutes. For instance, since 2000 our institute has a global budget. This substantially facilitates the yearly budgeting of funds originating from the federal government and leads to their more effective use in these times of budgetary constraints. Due to the creativity of the rector's department of resources since 2001 we even can transfer a small part of our governmental budget into the next year! This is an epoch-making change for an Austrian university institute. Thus we are very much looking forward to further autonomy for the BOKU.

The Institute of Chemistry is heavily engaged in undergraduate teaching. Nearly every student of the BOKU, presently ca. 6500, has to pass a course in chemistry. Indeed, amongst chemistry departments in Austria, our working load is one of the highest.

Substantial changes in the curricula of all five degree courses of the BOKU have also occurred in the period 1999 - 2001. Internal university study commissions sought, in line with the new University Study Law (UniStG 1997), to improve the quality of the curricula, while make them more concise with the aim of shortening the average number of years students take to complete their degrees. Our institute is part of the Faculty of Food Science and Biotechnology and, as such, was fully involved in shaping the degree course of this faculty. For the curricula of the other four degree courses, we observed a general trend favouring the applied sciences over more basic subjects such as mathematics and natural sciences. Such changes are, though, problematic since it is probably impossible for students to gain knowledge about the basic sciences later in their professional careers. Possibly the pendulum will swing back in the direction of basic subjects in subsequent reforms of the curricula.

Despite the teaching load, it is pleasing to report that the research output of the institute, as measured in terms of the types of methods used, amount of acquired external funds, numbers of undergraduate, postgraduate and postdoctoral workers performing research and numbers of publications, is rising. In addition, the number of

researchers from other countries and the international profile of the institute increase. This is due not only to the heightened motivation of the institute's members as a result of moving in 1996 to the new and better equipped Muthgasse II building, but is also the result of two new large-scale co-operations with industry.

Specifically, in October 1998, the "Christian Doppler Laboratory for Pulp Reactivity", whose most important partner is the Austrian company Lenzing AG, was founded under the leadership of Prof. Paul Kosma, whereas in January 2001 the "Wood Composites and Chemistry Competence Centre Austria (WOOD Kplus)" a co-operation between Austrian universities and industry began its work. Barbara Hinterstoisser from our institute is conducting research on the modification of lignocellulosic materials for improved composites. In addition to these initiatives, the numbers of projects funded by the Austrian Science Fund (FWF), the European Commission and other agencies continue to grow.

Our main limitation, though, even after the move five years ago and despite limited research funds, is really one of space. We have carefully optimised the allocation of rooms but nevertheless most of the work of the "Christian Doppler Laboratory of Pulp Reactivity" is performed in spare laboratories of the neighbouring Centre for Applied Genetics.


State of the art instrumentation and methodology is an essential prerequisite for successful experimental research. We continuously have to renew and expand our pool of specialised instruments. Already mass spectrometry in the fields of biomedicine and trace element analysis are important parts of the department's research, but with the advent of functional genomics and proteomics such facilities must be expanded - together with increased capabilities in different fields of analytical chemistry and NMR for structural studies.

Another challenge in the next few years for Austrian universities will be the new employment laws, which have been recently enacted by Parliament. Now, postdoctoral scientists - other than those paid from research grants - will only be able to have a contract of four years, rather than the ten years under the old system, as an university assistant. Within this time they will have to scientifically establish themselves and have the publications sufficient for the subsequent application for an associate professorship. The effects of this change of the university career structure are to date uncertain, I am confident, however, that the traditional common-sense of our university will allow us to make the best out of these altered circumstances.

Acknowledgements

I would first like to thank all members of our institute for their continuing achievements in performing excellent teaching and research.

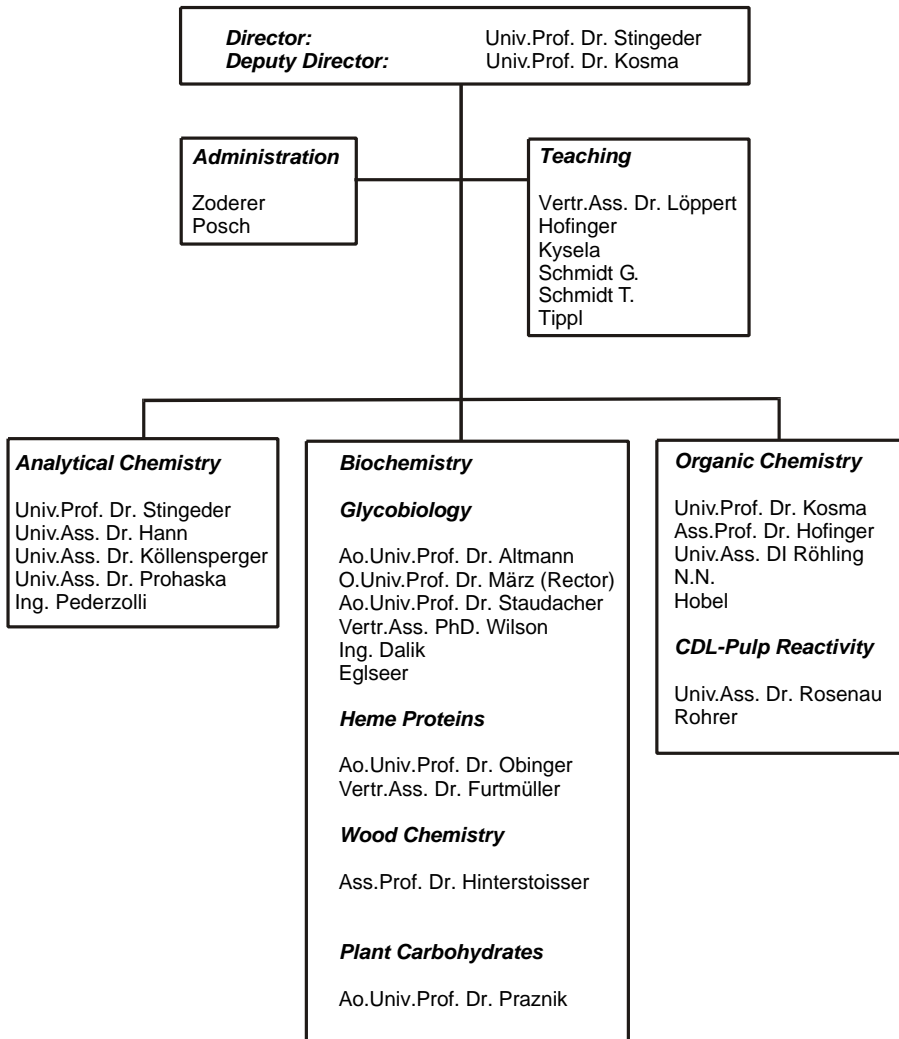
Also, on behalf of all members of the Institute of Chemistry, I would like to express our appreciation and gratitude to our university, our friends and research partners and all the agencies and institutions who have given financial support. We hope that their association with us will continue in the future.



Univ.Prof. Dr. Gerhard Stinger
Head of Institute

Organigram

ORGANIGRAM



Personnel

Director of Institute

Univ.Prof. Dipl.-Ing. Dr. Gerhard Stinger

Deputy Director of Institute

Univ.Prof. Dipl.-Ing. Dr. Paul Kosma

Full professor

O.Univ.Prof. Dipl.-Ing. Dr.Dr.h.c. Leopold März (presently Rector of the University of Agricultural Sciences)

Associate professors

Ao.Univ.Prof. Dipl.-Ing. Dr. Friedrich Altmann

Ao.Univ.Prof. Dr. Robert Ebermann, until 1999

Ao.Univ.Prof. Mag. Dr. Christian Obinger

Ao.Univ.Prof. Dipl.-Ing. Dr. Werner Praznik

Ao.Univ.Prof. Dipl.-Ing. Dr. Erika Staudacher

Assistant professors

Ass.Prof. Univ.Ass. Mag. Dr. Barbara Hinterstoisser

Ass.Prof. Univ.Ass. Dipl.-Ing. Dr. Andreas Hofinger

Ass.Prof. Univ.Ass. Dr. Juliane Paschinger, until 2000

Univ.Ass. Dipl.-Ing. Dr. Stephan Hann

Univ.Ass. Dipl.-Ing. Dr. Gunda Köllensperger

Univ.Ass. Mag. Renate Müller, until 1999

Univ.Ass. Dipl.-Ing. Dr. Thomas Prohaska

Univ.Ass. Mag. Dr. Michael Puchberger, until 2001

Univ.Ass. Dipl. Chem. Dr. Thomas Rosenau

Univ.Ass. Dipl.-Ing. Jürgen Röhrling

Vertr.Ass. Dipl.Chem. Dr. Richard Pongratz, until 1998

Vertr.Ass. Dipl.-Ing. Dr. Ursula Burner, part time, until 2001

Vertr.Ass. Dipl.-Ing. Dr. Paul Georg Furtmüller, part time, since 2001

Vertr.Ass. Dipl.-Ing. Dr. Christopher Latkoczy, until 1998

Vertr.Ass. Dr. Renate Löppert, part time

Vertr.Ass. Mag. Dr. Günther Regelsberger, part time, until 1998

Vertr.Ass. Iain B.H. Wilson BSc (Hons), DPhil, CChem, MRSC

Secretary

Petra Posch

Martina Zoderer

Technical Staff

Ing. Thomas Dalik

Gerald Ebner

Maria Hobel, since 1998

Ing. Alexandra Pederzoli

Ing. Verena Wagentrisl, on extended maternity leave

Practical Laboratory Staff

Alexandra Hofinger

Andrea Kysela, part time

Gernot Schmidt

Thomas Schmidt

Alexander Tippl, part time

Trainees

Susanne Eglseer

Martin Rohrer

Visiting Lecturers

O.Univ.Prof. Dr. Josef Leibetseder

Univ.Do. Dr. Bernhard Fischer

Ao.Univ.Prof. Dipl.-Ing. Dr. Karl Stich

Univ. Prof. Dr. Frank Unger (Guest Professor until 2000)

Ass. Prof. Dr. Juliane Paschinger

Dipl.-Ing. Manfred Schwanninger

Dipl.-Ing. Oliver Szolar

Demonstrators (Lektoren) 1998-2000

Dipl.-Ing. Ursula Burner

Dipl.-Ing. Paul Georg Furtmüller

Dipl.-Ing. Stephan Hann

Dipl.-Ing. Harald Leiter

Dipl.-Chem. Dr. Antje Potthast

Mag. Dr. Günther Regelsberger

Dipl.-Ing. Andreas Reiter

Dipl.-Ing. Manfred Schwanninger

Dipl.-Ing. Astrid Sevcik-Klößler

Dipl.-Ing. Mark Watkins

Dipl.-Ing. Norbert Wimmer

(Project) Personnel

M.Sc. Dr. Hassan Amer	ÖAD-Fellowship
Dipl.-Ing. Monika Bencúrova	FWF, Austrian Science Fund
Dipl.-Ing. Günter Bindeus	University of Agricultural Sciences, research grant; Austria
Dipl.-Ing. Sabine Bürgmayr	FWF, Austrian Science Fund
Gerald Ebner	Christian Doppler-Laboratory of Pulp Reactivity, Austria
Dipl.-Ing. Dr. Gustáv Fabini	FWF, Austrian Science Fund
Dipl.-Ing. Dr. Paul Georg Furtmüller	FWF, Austrian Science Fund, part time
Mag. Christa Jakopitsch	FWF, Austrian Science Fund
Dipl.-Ing. Walter Jantschko	FWF, Austrian Science Fund
Dipl.-Ing. Katharina Kanitsar	Research grant
Dipl.-Ing. Daniel Kolarich	Shared Cost Action (EU)
Dr. Thomas Lange	Marie-Curie-Fellowship (EU)
Dr. Elena Nicoletti	Christian Doppler-Laboratory of Pulp Reactivity, Austria
Mag. Johanna Nurmi	FWF, Austrian Science Fund
Dipl. Chem. Dr. Antje Potthast	Christian Doppler-Laboratory of Pulp Reactivity, Austria
Mag. Dr. Günther Regelsberger	FWF, Austrian Science Fund
Dipl.-Ing. Dr. Andreas Reiter	FWF, Austrian Science Fund, until 1999
Dipl.-Ing. Dubravko Rendic	Neose Technologies; (USA)
Dipl.-Ing. Jürgen Sartori	Christian Doppler-Laboratory of Pulp Reactivity, Austria
Dipl.-Ing. Gerald Schultheis	FWF, Austrian Science Fund
Dipl.-Ing. Manfred Schwanninger	Wood K plus (Public / Industry)
Dipl.-Ing. Susanne Siebenhandl	University of Agricultural Sciences, research grant; Austria
Barbara Stefke	Wood K plus (Public / Industry)
Dr. Tatiana Kirpenko	FWF, Austrian Science Fund
Dipl.-Ing. Mark Watkins	FWF, Austrian Science Fund, until 2000
Dipl.-Ing. Norbert Wimmer	FWF, Austrian Science Fund
Dr. Alla Zamyatina	FWF, Austrian Science Fund

Lectures and Practical Courses

The Institute of Chemistry takes part in the teaching of all five degree courses at the BOKU. The degree course in Food Science and Biotechnology (LBT) includes a broad education in chemistry. The other degree courses have mandatory lecture courses in General Chemistry and optional courses for some specialisations.

Presently more than 30 diploma and doctoral theses are supervised by members of our institute.

Lectures and Courses	Lecturers	Hours	Semester
MANDATORY COURSES			
605.018 Introductory Course			
to General and Anal. Chemistry for LBT	G. Stingeder / J. Paschinger	VO 2	WS
605.019 Introductory Practical Course			
to General and Anal. Chemistry for LBT	Inst. Personnel	UE 2	WS
605.020 General and Inorganic Chemistry for LBT	G. Stingeder /		
	T. Prohaska / G. Köllensperger	VO 4	WS
605.021 Analytical Chemistry for LBT	G. Stingeder / J. Paschinger	VO 4	1WS/3SS
605.023 Practical Course in			
Qualitative Inorganic Chemistry for LBT	Inst. Personnel	UE 8	SS
605.025 Practical Course in			
Quantitative Inorganic Analysis for LBT	Inst. Personnel	UE 8	WS
605.026 Organic Chemistry for LBT	P. Kosma	VO 3	WS
605.027 Practical Course in Organic Chemistry			
for LBT	Inst. Personnel	UE 2	1WS/1SS
605.022 Biochemistry for LBT	F. Altmann / C. Obinger /		
	E. Staudacher	VO 5	3WS/2SS
605.028 Practical Course in Biochemistry			
for LBT	Inst. Personnel	UE 8	4WS/4SS
605.029 Food Chemistry for LBT	F. Ulberth	VO 5	2WS/3SS
605.036 General and Inorganic Chemistry for LW	C. Obinger	VO 2	WS
605.039 Organic Chemistry and Biochemistry for LW	T. Rosenau / E. Staudacher	VO 3	SS
605.693 General Chemistry for KTWW/HW	B. Hinterstoisser	VO 3	WS
605.035 Organic Chemistry for HW	A. Hofinger	VO 2	SS
605.034 General Chemistry for HW	Inst. Personnel	UE 4	SS
425.028 Chemical Technology for HW	B. Hinterstoisser	VO 2	WS
Chemistry for LAP	A. Hofinger	VO 2	
OPTIONAL COURSES			
605.024 Environmental Analysis for LBT	Inst. Personnel	VO 2	SS

605.286 Bioorganic Chemistry for LBT	P. Kosma	VO 2	SS
605.627 Seminar in Biochemistry for LBT	Inst. Personnel	SE 2	WS
605.682 Biochemical Methodology for LBT	E. Staudacher	VO 2	WS
605.008 Protein Chemistry for LBT	B. Fischer	VO 2	WS
605.308 Glycobiology for LBT	F. Altmann / I.B. Wilson	VO 2	SS
605.275 Nutrition Sciences for LBT	J. Leibetseder	VO 2	WS
605.374 Chemistry and Analysis of Nutritional Additives for LBT	W. Praznik	VO 2	SS
605.550 Plant Biochemistry for LBT	K. Stich	VO 2	WS
605.737 Molecular Biology of Plants for LBT/LW	K. Stich	VO 2	SS
605.047 Wood Chemistry and Wood Analysis for HW	R. Wimmer / M. Schwanninger	VP 2	WS
605.038 Practical Course for LW	Inst. Personnel	UE 4	WS or SS

ADDITIONAL COURSES

605.031 Instrumental Methods in Analytical Chemistry	G. Stinger	VO 3	1,5WS/1,5SS
605.032 Practical Courses Analytical Chemistry III for LBT	G. Stinger	UE 4	WS or SS
605.037 Organic Chemistry for LAP	A. Hofinger	VO 2	SS
605.759 Selected Themes in Chemistry for KTWW	A. Hofinger	VO 2	SS
605.088 Practical Course KTWW	Inst. Personnel	UE 4	SS
605.016 Bioinorganic Chemistry for LBT	C. Obinger	VO 2	SS
605.660 Selected Themes in Plant Biochemistry for LBT	K. Stich	SE 2	WS
605.748 Selected Themes in Plant Molecular Biology for LBT	K. Stich	SE 2	SS
605.003 Seminar for Diploma Candidates for LBT	Inst. Personnel	DS 4	WS or SS
605.572 Seminar for Diploma Candidates for LBT	Inst. Personnel	DS 4	WS or SS
605.004 Seminar in Analytical Chemistry for PhD Candidates	G. Stinger	SE 2	WS or SS
605.803 Seminar in Bioorganic Chemistry for PhD Candidates	P. Kosma	SE 2	WS or SS
605.041 Seminar in Bioinorganic Chemistry for PhD Candidates	C. Obinger	SE 2	WS or SS
605.015 Seminar in Biochemistry for PhD Candidates for LBT	F. Altmann / E. Staudacher	SE 2	WS or SS

For more details look at <http://www.lzk.ac.at/lva/H605.html>

List of abbreviations:

DS Seminar for Diploma Candidates
SE Seminar for PhD Candidates
VO Lecture Course
VP Lecture and Proseminar
UE Practical Course
WS Winter Semester
SS Summer Semester

LBT Food Science and Biotechnology
LW Agriculture
KTWW Land and Water Management and Engineering
FW/HW Forestry (FW) and Wood Technology (HW)
LAP Landscape Architecture and Planning

Doctoral and Diploma Theses

Analytical Chemistry

Kanitsar Katharina

CE-ICP-MS for rhizosphere research

Doctoral thesis since 2000

Supervisor: Gerhard Stingeder/Gunda Köllensperger

Nurmi Johanna

CE-ICP-MS for metal complexation studies

Doctoral thesis since 2000

Supervisor: Gerhard Stingeder/Gunda Köllensperger

Schultheis Gerald

Isotope ratio measurements by ICP-MS

Doctoral thesis since 2001

Supervisor: Gerhard Stingeder/Thomas Prohaska

Hann Stephan

Novel Applications of HPIC-ICP-MS

Doctoral thesis 2001

Supervisor: Gerhard Stingeder

Watkins Mark

Precise isotope ratio and multielement determination in prehistoric and historic human skeletal remains by HR-ICPMS

Doctoral thesis 2000

Supervisor: Gerhard Stingeder/Thomas Prohaska

Prinz Günter

Measurement of iridium in geological samples using high resolution inductively coupled plasma mass spectrometry

Diploma thesis 2000

Supervisor: Gerhard Stingeder/Gunda Köllensperger

Hann Stephan

Investigation of rare earth elements by HR-ICP-MS

Diploma thesis 1998

Supervisor: Gerhard Stingeder/Thomas Prohaska

van Hulle Marijn

Multielement analysis of environmental samples by high resolution inductively coupled plasma mass spectrometry

Diploma thesis 1998

Supervisor: Gerhard Stingeder/Thomas Prohaska

De Winne Kristof

Multielement analysis of human milk samples by high resolution inductively coupled plasma mass spectrometry

Diploma thesis 1998

Supervisor: Gerhard Stingeder/Thomas Prohaska

Stadlbauer Christina

Dendrochemical investigations by means of HR-ICP-MS and LA-ICP-MS

Diploma thesis 1998

Supervisor: Gerhard Stingeder/Thomas Prohaska

Latkoczy Christopher

Trace elements – Novel applications and new frontiers in double focusing high-resolution inductively coupled plasma mass spectrometry

Doctoral thesis 1998

Supervisor: Gerhard Stingeder/Thomas Prohaska

Biochemistry A / Glycobiology

Ahrer Karin

Analyse komplexer Glycane aus *Arionta*

Diploma thesis since 2000

Supervisor: Staudacher Erika

Freilinger Angelika

Reinigung und kinetische Charakterisierung rekombinanter Fucosyltransferase

Diploma thesis since 2000

Supervisor: Altmann Friedrich

Kaar Waltraud

Glykosylierung des Beifuß-Allergens Art v 1

Diploma thesis since 1999

Supervisor: Altmann Friedrich

Ludescher Ursula

Entwicklung von Analysemethoden zur Identifikation und Quantifizierung der Flavonoidinhaltsstoffe von *Anthemis Tinctoria*

Diploma thesis since 1999

Supervisor: Altmann Friedrich

Peyer Christian

Reinigung und Charakterisierung einer Xylosidase

Diploma thesis since 2000

Supervisor: Staudacher Erika

Schenkermayr Hannelore

Untersuchung von Holunderbeeren im Hinblick auf ihren Lektin Gehalt und ihre lebensmitteltechnologische Verwertbarkeit unter besonderer Berücksichtigung der Sorten des Reifeszustandes und der Standorte

Diploma thesis since 2000

Supervisor: Staudacher Erika

Schopfhauser Hannelore

N-Glykan-Analyse von Kartoffeln in verschiedenen Entwicklungsstadien

Diploma thesis since 1999

Supervisor: Staudacher Erika

Bindeus Günter

Färberpflanzen

Doctoral thesis since 1999

Supervisor: Altmann Friedrich

Bürgmayr Sabine

N-Glykane der Gastropoden

Doctoral thesis since 2000

Supervisor: Staudacher Erika

Kolarich Daniel

Comparative analysis of glycoproteins-glycans in native and genetically modified food crops

Doctoral thesis since 2000

Supervisor: Altmann Friedrich

Rendic Dubravko

Phosphorylierung der 1,4-Galaktosyltransferase

Doctoral thesis since 1999

Supervisor: Altmann Friedrich/Iain Wilson

Weissmann Ingrid

Immunologische Eigenschaften von Neo-Glykoproteinen mit verschiedener Belegungsdichte.

Diploma thesis since 1998

Supervisor: Altmann Friedrich

Schmidt Rita

Methodenentwicklung für die Analyse negativ geladener N-Glykane

Diploma thesis 2001

Supervisor: Staudacher Erika

Hartmann Eva-Maria

Herstellung immunogener N-Glykane mittels rekombinanter Fucosyltransferase

Diploma thesis 2001

Supervisor: Altmann Friedrich

Schwab Christina

Verwendung metabolisch kompetenter menschlicher Hepatoma Zellen (Hep G2) und subzellulärer Enzymfraktionen zur Untersuchung DNA-schädigender Effekte von heterozyklischen aromatischen Aminien.

Diploma thesis 2001

Supervisor: März Leopold

Kolarich Daniel

Massenspektroskopische Analyse von elektrophoretisch aufgetrennten Glykoproteinen : Identifizierung der N-Glykanstrukturen der Allergene Ara h1 aus der Erdnuss, Ole e1 aus Olivenpollen und einem 50 kDa Haselnussallergen

Diploma thesis 2000

Supervisor: Altmann Friedrich

Viehauser Petra

Adsorptionsmatrices zur Bestimmung kohlenhydratspezifischer Antikörper

Diploma thesis 2000

Supervisor: Altmann Friedrich

Mayer Sigrid

Einsatz der Kapillar-Elektrophorese und Kapillar-Elektrochromatographie in der Analyse von biologischen Mikro-Proben

Doctoral thesis 1999

Supervisor: März Leopold

Halama Thomas

Characterisation of VE-cadherin- and PECAM-1-function within the adherens junction complex of human endothelial cells

Doctoral thesis 1999

Supervisor: Altmann Friedrich

Bürgmayr Sabine

Sialylierung von Gastropoden

Diploma thesis 1999

Supervisor: Altmann Friedrich/Erika Staudacher

Rieger Manfred

Genetische Charakterisierung eines Modells caniner von Willebrand Faktor (vWF): Defizienz und Nachweis der vWF Transkription in monozytenähnlichen Zellen

Doctoral thesis 1999

Supervisor: März Leopold

Grabner-Meier Heidemarie

Strukturanalyse von N-Glykanen aus Schnecken

Diploma thesis 1999

Supervisor: Altmann Friedrich/Erika Staudacher

Leiter Haralt

1,3-Fukosyltransferase: Reinigung aus *Vigna radiata*, Klonierung und Expression in Sf21-Zellen

Doctoral thesis 1999

Supervisor: Altmann Friedrich

Paschinger Katharina

Strukturelle Charakterisierung der Peptid N-Glykosidase A und ihrer Asparagin-gebundenen Glykane

Diploma thesis 1998

Supervisor: Altmann Friedrich

Roitinger Andreas

Entwicklung einer HPLC-Methode zur Bestimmung von 1,3- und 1,6-Fucosyltransferasen

Diploma thesis 1998

Supervisor: Altmann Friedrich

Korosec Thomas

Systematische Klassifizierung von Kernmatrixproteinen

Doctoral thesis 1998

Supervisor: März Leopold

Biochemistry B / Heme Protein Research Group and Wood Chemistry Group

Kaltenegger Karl

Entwicklung von Nachweismethoden für humane Myeloperoxidase

Diploma thesis since 2000

Supervisor: Obinger Christian

Jantschko Walter

Developing of specific inhibitors of human peroxidases

Doctoral thesis since 2001

Supervisor: Obinger Christian

Jakopitsch Christa

Structure function relationships of catalase-peroxidase

Doctoral thesis since 2000

Supervisor: Obinger Christian

Nowotny Manuela

Forest response to environmental stress at timberlines

Diploma thesis since 1999

Supervisor: Hinterstoisser Barbara

Plasser Lisa

Expression, Reinigung und Charakterisierung von Thioredoxin Peroxidase

Diploma thesis since 2000

Supervisor: Obinger Christian

Schwaiger Hansjörg

Cloning, over-expression and kinetic characterisation of monofunctional catalase from *Nostoc p.*

Diploma thesis since 2001

Supervisor: Obinger Christian

Schwanninger Manfred

Spurce wood: Lignin chemistry and anatomy as quality factors

Doctoral thesis since 1999

Supervisor: Kosma Paul/Hinterstoisser Barbara

Stich Leo

Investigation of subfossil wood originating from Northern Finland

Diploma thesis since 1998

Supervisor: Hinterstoisser Barbara

Zederbauer Martina

Der Mechanismus der Inaktivierung menschlicher Myeloperoxidase durch Isoniazid und Iproniazid

Diploma thesis since 1998

Supervisor: Obinger Christian

Dornstauder Eva

Untersuchungen zur Kinetik der Oxidation aromatischer und aliphatischer Thiole durch Horseradish Peroxidase

Diploma thesis 2001

Supervisor: Obinger Christian

Laaha Ulrike

Die Eisen-Superoxiddismutase in *Anabaena variabilis*: Klonierung, Sequenzierung, Überexpression in *E. coli* und Charakterisierung

Diploma thesis 2001

Supervisor: Obinger Christian

Krapfenbauer Gottfried

Die Kinetik der Oxidation und Inhibierung humaner Myeloperoxidase durch Hydrochinone

Diploma thesis 2001

Supervisor: Obinger Christian

Wiesinger Christoph

Expression humaner myeloperoxidase in *Pichia pastoris* und *E. coli*

Diploma thesis 2001

Supervisor: Obinger Christian

Burner Ursula

Peroxidase-derived free radicals and their impact on enzyme activity

Doctoral thesis 2000

Supervisor: März Leopold

Furtmüller Paul Georg

Mechanism of reaction of human myeloperoxidase with peroxides and (pseudo-)halides

Doctoral thesis 2000

Supervisor: Obinger Christian

Vötsch Bettina

Einfluß von Phenolen auf die Peroxidase-katalysierte Thioloxidation und Sauerstoffaktivierung

Diploma thesis 2000

Supervisor: Obinger Christian

Pircher Andrea

Katalase-Peroxidase aus dem Cyanobakterium *Anacystis nidulans* (*Synechococcus* PCC 6301):
proteinchemische und kinetische Untersuchungen

Diploma thesis 2000

Supervisor: Obinger Christian

Engleder Markus

Identifizierung, Klonierung und Überexpression des *katG* Gens aus *Anacystis nidulans* (*Synechococcus*
PCC6301) in *E. coli* und Charakterisierung der rekombinanten Katalase Peroxidase

Diploma thesis 2000

Supervisor: Obinger Christian

Dietmann Dagmar

Detoxifizierung von reaktiven Sauerstoffspezies im stickstofffixierenden Cyanobakterium *Anabaena variabilis*
ATCC 29413

Diploma thesis 2000

Supervisor: Obinger Christian

Paumann Martina

Untersuchungen zur Reaktivität humaner Myeloperoxidase mit Benzoessäurehydraziden

Diploma thesis 1999

Supervisor: Obinger Christian

Jantschko Walter

Oxidation of aliphatic and aromatic thiols by human myeloperoxidase: oxygen-activation and enzyme inhibition

Diploma thesis 1999

Supervisor: Obinger Christian

Richter Marion

Wirkung von Flavonoiden auf die Wachstumsregulation von normalen, prä-malignen und malignen Epithelzellen
des Kolon

Doctoral thesis 1999

Supervisor: Ebermann Robert

Sushika Joshi

Inhaltsstoffe von *Zanthoxylum armatum*

Doctoral thesis 1999

Supervisor: Ebermann Robert

Unteregger Ruth

Ligninbestimmung in Coniferenholz mittels DRIFT-Technik

Diploma thesis 1998

Supervisor: Hinterstoisser Barbara

Laggner Hildegard

Vitamin C and the cells of the immune system

Doctoral thesis 1998

Supervisor: Ebermann Robert

Schwanninger Manfred

Der photochemische Abbau von Pentachlorphenol mit Hilfe des Photosensitizers Methylenblau in alkalischem Millieu

Diploma thesis 1998

Supervisor: Ebermann Robert

Organic Chemistry and Christian Doppler-Laboratory of Pulp Reactivity

Bohrn Rainer

Strukturuntersuchungen an Xanthan

Diploma thesis, since 2001

Supervisor: Kosma Paul, Hofinger Andreas

Kronsteiner Michael

Synthese von UDP-*N*-Acetylmannosaminuronsäure

Diploma thesis since 2000

Supervisor: Kosma Paul

Kühr Romana

Vergleichende chemische und elektrochemische Oxidation ausgewählter Mono- und Disaccharide

Diploma thesis 2001

Supervisor: Kosma Paul, Rosenau Thomas

Stefke Barbara

Intramolekulare Reaktionen von Aminozuckern

Diploma thesis since 1997

Supervisor: Kosma Paul, Müller Renate

Sartori Jürgen

Alkalisierung von Zellstoffen

Doctoral thesis since 2000

Supervisor: Kosma Paul, Rosenau Thomas

Glück Alexander
Synthese von LPS-Teilstrukturen der Gattung *Acinetobacter*
Diploma thesis 2001
Supervisor: Kosma Paul

Amer Hassan
Chemical synthesis of O-glycoside antigens related to *Toxocara canis*
Doctoral thesis 2001
Supervisor: Kosma Paul

Sartori Jürgen
Synthese von Celluligosacchariden
Diploma thesis 2000
Supervisor: Kosma Paul

Reiter Andreas
Synthese dephosphorylierter Core-Strukturen von *Pseudomonas aeruginosa* Lipopolysacchariden
Doctoral thesis 2000
Supervisor: Kosma Paul

Röhring Jürgen
Oxidative Modifikation und Fluoreszenzmarkierung von Zellstoffen
Doctoral thesis since 1999
Supervisor: Paul Kosma, Rosenau Thomas

Wimmer Norbert
Synthese von Disacchariden aus der Kernregion von Lipopolysacchariden aus *Acinetobacter* und *Burkholderia*
Doctoral thesis 2001
Supervisor: Kosma Paul

Research Group - Plant Carbohydrates

Kocsisova Laura
Qualitätskriterien für Topinapur zur Anwendung in der LMI
Doctoral thesis since 2000
Supervisor. Praznik Werner

Maghuly Fatemeh
Doctoral thesis since 1999
Supervisor. Praznik Werner

Kocsisova Laura

Einfluß von Sorte, Erntezeitpunkte und verschiedene Konservierungsarten auf ausgewählte Qualitätsparameter bei Topinanburen

Diploma thesis 2000

Supervisor. Praznik Werner

Kogler Andreas

Charakterisierung von Glucanen mit 2-Aminopyridin

Diploma thesis 1999

Supervisor. Praznik Werner

Yasar Samim

Technologische Qualität von Cellulose, Hemicellulosen und bei Miscanthus Giganteus und Cannabis sativa L.

Doctoral thesis 2000

Supervisor. Praznik Werner

Research Activities

Analytical Chemistry

The research group is working in the field of elemental ultra trace analysis by ICP-MS (inductively coupled plasma mass spectrometry). The potential of ICP-MS is explored by methodological developments and applications for solving problems in fields such as environmental sciences, biology/medicine and anthropology/archaeology.

Sample preparation and operation of the instrument (Element, Finnigan MAT) are performed in clean room facilities to utilise the capabilities of ICP-MS in the ultra trace concentration range of $\text{ng}\cdot\text{g}^{-1}$ to $\text{sub pg}\cdot\text{g}^{-1}$.

Current activities:

Methodological developments:

- Isotopic ratio measurements with high precision (Sr, Pb, S, U)
- Coupling of ICP-MS with HPLC and HPIC for speciation studies and trace matrix separation to eliminate matrix effects
- Coupling of ICP-MS with CE (capillary electrophoresis) for speciation studies (interface development, speciation protocols)
- Development of CE methods for analysis of amino acids and low molecular weight organic acids
- Coupling of ICP-MS with laser ablation for direct analysis and isotope ratio measurement of solid materials
- Certification of reference materials (within EU-programs)
- Evaluation of uncertainty in analytical measurement and implementation of protocols for traceability in chemical analysis

Current applications:

- Isotopic ratio measurements and elemental pattern in prehistoric human bones and archaeological findings
- Isotopic ratio measurements and elemental pattern in soil profiles
- Analysis of platinum group elements in road dust/urban aerosol and biological samples
- Analysis of exudation patterns (amino acids, organic acids) of hyperaccumulating plants by CE
- Metal complexes formed by exudates in the rhizosphere (CE-ICP-MS)
- Stability of metal complexes formed in the Lyocell process during solvation of cellulose (CE-ICP-MS)
- Ultra trace analysis in TIBr solid state detector material
- Ultra trace analysis of U and Th in geological and environmental samples

Biochemistry A / Glycobiology

„Erst wenn das letzte Gen kloniert, das letzte Nukleotid sequenziert und das letzte Chromosom kartiert ist, werdet ihr bemerken, daß Nukleinsäuren nicht die Speise, sondern nur das Rezept sind.“

For a long time, the biological intelligence of complex sugars has been as much ignored as Cinderella and only recently have biotechnology and biochemistry indicated that they might invite sugars to the ball. While the understanding of the role of protein-linked carbohydrate is by far still neither satisfactory nor complete, it became evident that the abilities to structurally define protein-glycans and, even more, to control the glycosylation of recombinant proteins are essential.

The long-term goal of research in the Glycobiology Division of the Institute of Chemistry is to understand the biological significance of protein-glycosylation and to control the biosynthesis of protein-glycans. According to the old rule that one should know the "enemy", the basis of our work is the structural analysis of complex carbohydrates. For this, we have adopted and developed a panel of methods including preparation and purification of protein-glycans and analysis by high-performance chromatography and mass spectrometry (linear MALDI-TOF MS). The focus of the structural work was and still is on non-mammalian protein-glycosylation. We deal with samples from insects, molluscs, nematodes and especially plants.

Hand in hand with the elucidation of structures goes the study of the biosynthesis of complex carbohydrates in these organisms. To this end, we characterise the enzymes that build and degrade glycans. Roughly three years ago, we (chaperoned by the BOKU's Centre of Applied Genetics) started with molecular biology of glycosyltransferases which led to the first-ever cloning of several plant glycosyltransferases and to the valuable ability to produce pure recombinant transferases. The recent cloning of an insect enzyme responsible for a neuronal-specific glycan modification enables us to study the physiological role of such glycans by means of RNA interference. Generally, the molecular biology is performed on "model organisms" such as *Drosophila melanogaster*, *Caenorhabditis elegans* and *Arabidopsis thaliana* to make use of, and at the same time contribute to, the large amount of knowledge accumulated about these selected organisms.

Special concern is devoted to the immunology of protein glycans. Certain widespread structural features of glycoproteins from plant and lower-animal are immunogenic in humans. Moreover, as part of an allergic reaction, glycans may become IgE-epitopes. Our aim is a definition of the role of glycans in eliciting an allergic response and the improvement of the specificity of *in vitro* allergy diagnosis.

Biochemistry B / Haemoprotein Research Group and Wood Chemistry Group

The main objective of research is to understand the structural basis of metalloprotein functions, with particular interest in haem-containing enzymes, superoxide dismutases and non-haem peroxidases (thioredoxin peroxidases). The proteins are purified from various organisms and the corresponding genes are identified, cloned, sequenced, and the proteins finally heterologously overexpressed (e.g. in *Escherichia coli*). Both steady-state and pre-steady-state kinetic investigations in combination with various spectroscopic techniques (e.g. UV-Vis, electron spin resonance, resonance Raman etc.), site-directed mutagenesis and crystallisation studies are performed.

- (i) Recombinant bifunctional bacterial catalase-peroxidases (Class I of the Superfamily I of plant, fungal and bacterial peroxidases) from cyanobacteria are purified and characterized. Catalase-peroxidases are the only peroxidases with substantial catalase activity and are responsible for the activation of many drugs (e.g. the anti-tubercular drug isoniazid in *Mycobacterium tuberculosis*).
- (ii) Human peroxidases (Superfamily II of animal peroxidases) are purified from human blood. Myeloperoxidase and eosinophil peroxidase are isolated from leukocytes (neutrophils and eosinophils, respectively). The main objective is to understand the mechanism of substrate oxidation (two-electron pathway *versus* one-electron pathway) and the structural basis of the different physical and chemical features of the redox intermediates. The role of protein radicals in enzyme activity and the nature of the haem linkage to the apoprotein, and the relevant biosynthetic steps, is investigated. Furthermore, both myeloperoxidase and eosinophil peroxidase as pharmacological targets are tested in order to develop mechanism-based inhibitors (e.g. suicide substrates). Myeloperoxidase and eosinophil peroxidase play an essential role in host defence but also contribute to many (inflammatory) pathologies. Therefore, it is obviously desirable to design drugs that will dampen inflammation without precipitating infectious diseases.
- (iii) Cytochrome c oxidase, the key enzyme of cell respiration and, hence, of energy metabolism from the cyanobacterium *Synechocystis* PCCC 6803 is planned to be overexpressed either in *Rhodobacter sphaeroides* or in *Synechocystis* itself in order to obtain sufficient amounts for in-depth spectroscopic and kinetic studies, for site-directed mutagenesis to elucidate the paths of electrons (intramolecular electron transfer) and protons (transmembrane proton-pumping) in the enzyme and finally also for high-resolution protein crystallography. The study of this intriguing cyanobacterial enzyme has generated extremely interesting, previously unencountered, problems regarding metal content, haem promiscuity, possible proton channels and binding of adenine nucleotides (regulation of enzyme activity by intracellular ADP/ATP ratios).
- (iv) Recombinant iron- and manganese containing superoxide dismutases from cyanobacteria are investigated in order to understand the molecular mechanism of superoxide dismutation and oxygen protection in nitrogen fixing cyanobacteria.
- (v) Recently, cyanobacterial thioredoxin peroxidase has been cloned and overexpressed successfully in *Escherichia coli*. These less characterized enzymes contain two redox-active cysteine residues at the active site, which are involved in peroxide detoxification. Various peroxides and electron donors are investigated in order to elucidate the mechanism of electron transport and peroxide reduction.

Wood Chemistry Group:

Different wood components like lignin, cellulose and extractives, their occurrence, their native composition and structure are the objective of investigation of the group. The main project at present deals with the **"Modification of lignocellulosic materials for improved composites"**. This "Area 1" within the **"Wood Composites and Chemistry Competence Center Austria (WOOD)"** is coordinated by the Institute of Chemistry.

The Competence Center in general focuses on the joint utilisation of facilities and pooling of experience by several academic institutes and industrial partners. The aim is to improve the level of scientific expertise and the infrastructure for the innovation process in the wood products industry in Austria.

The aim of area 1 is to modify lignocellulosic material, in particular wood fibres and particles, to provide better and homogenous raw material for high-value wood composites. Improved dimensional stability, biological resistance and gluing behaviour of the raw material wood, as well as environmentally harmless processes are the main targets. Biochemistry, biotechnology and chemistry supply the tools to reach these goals.

Methodologies for both the enzymatic and chemical modification, for the modification of wood fibres by fungal laccases, screening for suitable fungal strains used in the biopulping, and methodology for the structural and chemical characterization of (modified) wood are developed.

The work is done at the Institute of Chemistry (Boku), the Institute of Food Technology (Boku), the Institute of Physics (Boku), the Institute of Biochemical Technology and Microbiology (TU-Vienna) and Fritz Egger GmbH as main industrial partner.

The area focuses on the determination and investigation of technologies that may significantly improve the quality of lignocellulosic material, predominantly wood, used for the production of medium density fibreboard (MDF), oriented strand board (OSB) and particle board. The properties are evaluated in comparison with those achieved with present technology using non-modified material. Partial removal and alteration of lignin or hemicelluloses using newly adapted enzyme systems should improve the natural binding capacities of lignocellulosic material and enable them to meet higher quality standards. Through "biopulping" processes, a partial maceration to remove lignin from the middle lamella should reduce energy consumption during refining and also improve the internal bonding for MDF. Fibres are modified chemically using new agents with improved specificity of the targeted polymers. Synergistic effects with enzymatic-modified fibres will be investigated. Novel analytical methods will be utilised to correlate structural with physico-mechanical properties of composites. The goal is to develop and optimise technologies to modify wood for improved and high-performance composites.

Research Group Organic Chemistry

The major research activities of the group are focused on biomedically important carbohydrates located at the surface of cells. For a thorough understanding of the interactions between those carbohydrate ligands and

proteins at the molecular level, knowledge of the chemical and three-dimensional structures is required, since these are relevant to the dynamic behaviour of the biomolecules in solution as well as in the binding process.

As an illustrative example of this approach, the interaction of carbohydrate ligands with monoclonal antibodies – which are useful for diagnosis of bacterial infections – could be elucidated in international co-operations using high-field NMR spectroscopy as well as crystal studies of Fab – ligand complexes.

The expertise of the group covers the chemical synthesis of complex carbohydrates, which are provided as multifunctional ligands to be linked via spacer groups to affinity matrices for the purification of antibodies or to be conjugated to proteins for immunochemical studies, *i.e.* the generation and characterization of monoclonal antibodies for diagnostic and therapeutic application.

In particular, the components of bacterial lipopolysaccharides are being studied, comprising endotoxins of human, animal and plant pathogenic species. The intracellular parasite *Chlamydia* is recognised to be associated with coronary heart diseases and one of the major projects deals with the chemical synthesis of chlamydial lipid-linked sugars which are potent inducers of inflammatory responses. The chemical synthesis is the only means to provide this material for immunobiological studies, since only microgram amounts of the native compounds may be obtained from cell cultures with the highly infectious agent.

In addition, progress has been achieved in the synthesis of nucleotide activated sugars, which were of particular value in the elucidation of the biosynthetic pathway of the bacterial heptose region, which now offers various targets for the development of enzyme inhibitors as novel antibacterial drugs.

NMR spectroscopy is of prime importance not only as support for the synthetic projects, but also as key method in the structural and biosynthetic studies of Surface-Layer glycoproteins performed in close cooperation with the Centre of Ultrastructure Research.

Christian Doppler Laboratory of Pulp Reactivity

Cellulose constitutes the most important renewable resource on a worldwide scale, which however, has so far been used as a supply for the chemical industry only to a very small extent. The CD Laboratory is involved in manifold basic and applied studies relevant to the production of dissolving pulps, including cooking and bleaching processes as well as derivatisation and regeneration steps. The chemical and physicochemical changes of cellulosic substrates as well as residual materials such as lignin and hemicelluloses are under investigation using modern instrumental analytical techniques. The detailed knowledge of chemical functional groups, the amorphous and crystalline regions and the solution state on the molecular level is expected to lead to a rational analysis of the properties of cellulose in the Viscose process as well as in the modern Lyocell process using *N*-methyl-morpholine-*N*-oxide hydrate (NMMO) as solvent.

Thus, projects are dealing with the investigation of reaction mechanisms, elucidation of side reactions, determination of substituent distributions along the cellulose chains, yellowing processes, the role of stabilizers and the impact of metal ions. A broad spectrum of instrumental techniques is being used, such as static and dynamic Light Scattering, Electron microscopy, Liquid- and Solid State NMR (CPMAS), Infrared- and Raman spectroscopy, Electron Spin Resonance Spectroscopy and X-ray crystallography, as well as Dielectric Resonance Spectroscopy and Mass Spectrometry. The CD Lab operates a modern GPC system with a fluorescence and a multiple angle laser light scattering detector, allowing for the determination of absolute molecular weight distributions of cellulose in the solvent system DMAc / LiCl.

The results are expected to contribute to a better specification profile of cellulosic substrates, to improved process control and product properties and enhanced use of other wood components and process by-products.

Research Group Plant Carbohydrates and Interuniversity Research Group: Native Polymers & Colloids

Expertise: Investigating correlations between molecular structures, biological functionality and options to transfer selected features to technological applications.

- structure analysis and characterisation of biopolymers by means of physico-chemical methods
- software/hardware development combined with customisable data-manipulation in the field of polymer characterisation
- biochemical techniques for synthesis and characterisation of carbohydrate-type biopolymers
- pure chemical and enzymatically supported structure-analysis of biopolymers (in particular for glucans and fructans)
- investigation of the interactions which result in the formation of coherently-acting supermolecular polysaccharide structures
- isolation, purification, fractionation, preparation and modification of plant raw materials
- investigations with respect to control mechanisms in plants (e.g. carbohydrate/nitrogen metabolism)
- investigations of stress-parameters and stress-related metabolites (secondary metabolites, reserve-carbohydrates)
- application of agronomical crops as 'Novel Food'
- establishing significant quality criteria for classification of plant raw-materials
- classification of crops with respect to nutritional (food) and technological (non-food) value

Selected research activities:

- isolation / preparation of carbohydrates / enzymes / other compounds of interest from renewable materials
- qualitative and quantitative analysis of carbohydrates
- controlled enzymatic synthesis and transformation of glucans and fructans
- oligomer/polymer-characterisation of native and modified plant glucans and fructans
- correlation of molecular characteristics with technological qualities + development and discussion of models and synthesis of reference-materials
- ranking/classification of molecular characteristics as controlling parameters for functionality of biopolymers

Scientific Projects

Analytical Chemistry

Stable strontium isotope ratio measurements of prehistoric and historic human bone samples

Start: 01 08 1998

End: 31 07 2001

Cooperation: Department of Archaeological Biology and Anthropology, Museum of Natural History, Austria

Financing: FWF, Austrian Science Fund

Measurement of Sr isotopic ratios in throughfall samples - participation in FWF-Project: Calcium foliar leaching by precipitation as a function of Ca availability for sugar maple stands (*Acer saccharum*) in New Hampshire, USA

Start: 01 01 1998

End: 01 07 1999

Cooperation: Institut für Waldökologie, University of Agricultural Sciences, Vienna

Financing: FWF, Austrian Science Fund

Determination of anthropogenic and geogenic lead in soil profiles by lead isotope ratio measurements by high resolution inductively plasma mass spectrometry (HR-ICPMS)

Start: 31 10 1998

End: 31 05 1999

Cooperation: Institut für Bodenforschung, University of Agricultural Sciences, Vienna

Financing: Hochschuljubiläumsstiftung der Stadt Wien

Atmospheric intake of heavy metals by dry, wet and occult deposition in the Achenkirch height profile

Start: 01 03 1997

End: 01 09 1999

Cooperation: Institute of Analytical Chemistry, University of Technology Vienna

Financing: BM für Land- und Forstwirtschaft; Vienna; Austria

Dendrochemical investigations of spruce clones

Start: 01 06 1998

End: 01 06 2000

Cooperation: Institut für Botanik, Institut für Waldökologie, University of Agricultural Sciences, Vienna

Financing: BM für Land- und Forstwirtschaft; Vienna; Austria

Determination of ^{234}U , ^{235}U , ^{238}U and ^{232}Th in industrial ores by on-line high performance ion chromatography inductively coupled plasma mass spectrometry (HPIC-ICP-SMS)

Start: 01 03 1998
End: 01 03 2001
Financing: Treibacher Industrie AG

Preparation of four certified reference materials for rare earth elements

Start: 01 03 1997
End: 31 05 1999
Financing: European Commission

Production and certification of a road dust reference material for platinum, palladium and rhodium used in automotive catalytic converters

Start: 01 01 1999
End: 31 03 2001
Cooperation: Institut für Ökologische Chemie, GSF, Neuherberg, Germany
Institute of Analytical Chemistry, University of Technology Graz
Financing: European Commission

Analysis of platinum, palladium and rhodium in Viennese urban aerosol by ICP-SMS

Start: 01 10 1999
End: 01 06 2003
Cooperation: Institute of Analytical Chemistry, University of Technology Vienna
Financing: Hochschuljubiläumsstiftung der Stadt Wien
Bodenkulturpreis 2001 der Wirtschaftskammer Wien

Measurement of cisplatin, carboplatin, 5-fluorouracil and methotrexate concentrations in head and neck cancers by in vivo microdialysis

Start: 01 01 1997
End: 01 06 2000
Financing: AKH Vienna

Development of a sequential extraction scheme for As in soils and subsequent detection with ICP-MS

Start: 06 11 1995
End: 31 12 1998
Cooperation: Institut für Bodenforschung, University of Agricultural Sciences, Vienna
Financing: -----

The fate of arsenic in the rhizosphere - Participation in project: Rhizosphere processes: Modelling and experimental assessment of metal interaction with organic ligands exuded by plant roots

Start: 01 10 2001
 End: 01 10 2002
 Cooperation: Institut für Bodenforschung, University of Agricultural Sciences, Vienna
 Financing: BOKU-Project 16

Assessment of root exudates and metal speciation in rhizosphere solutions of metal hyperaccumulators using capillary electrophoresis (CE) and CE hyphenated to inductively coupled plasma sector field mass spectrometry (CE-ICP-SFMS): Method development and application

Start: 01 09 2001
 End: 31 08 2004
 Cooperation: Institut für Bodenforschung, University of Agricultural Sciences, Vienna
 Financing: FWF, Austrian Science Fund

CE-ICP-MS for the determination of metal complexes:

Hyphenation of capillary electrophoresis hyphenated to inductively coupled plasma sector-field mass spectrometry (CE-ICP-SMS) – A novel analytical technique for metal complexation studies of *N*-methyl morpholine-*N*-oxide and its degradation products

Start: 01 08 2000
 End: 01 08 2003
 Cooperation: Christian Doppler Laboratory of Pulp Reactivity, BOKU
 Financing: FWF, Austrian Science Fund

Biochemistry A / Glycobiology

-1,6-Fucosylation of N-glycans: catalysed by one single enzyme or an enzyme family?

Start: 01 01 1998
 End: 30 06 2000
 Financing: FWF, Austrian Science Fund

Do glycoproteins from foods contain the human Lewis A epitope? Structural analysis of the N-glycans from food glycoproteins

Start: 01 09 1998
 End: 31 08 2000
 Financing: Österreichische Nationalbank, Jubiläumsfonds

The structural, biosynthetic and genetic basis of anti-horseradish peroxidase carbohydrate epitopes in *Drosophila melanogaster* and *Caenorhabditis elegans*

Start: 01 10 1999
 End: 30 09 2002
 Financing: FWF, Austrian Science Fund

Carbohydrate mediated immunological cross-reactions of glycoproteins from plants and invertebrates

Start: 01 10 1999
End: 30 11 2000
Financing: Hochschuljubiläumsfonds

Phosphorylation of 1,4-galactosyltransferases

Start: 01 09 1999
End: 30 10 2000
Financing: Neose Technologies

New methodology for assessing the potential of unintended effects in genetically modified food crops (GMOCARE)

Start: 01 02 2000
End: 31 01 2003
Financing: European Commission

Preparation and use of flavonoid extracts

Start: 01 10 1999
End: 31 08 2001
Financing: BOKU

Purification, cloning and expression of the 1,3-fucosyltransferase from mung beans

Start: 01 01 1998
End: 31 12 1999
Financing: FWF, Austrian Science Fund

N-Glycosylation of gastropods

Start: 01 02 2000
End: 31 01 2003
Financing: FWF, Austrian Science Fund

Biochemistry B / Haem Protein Research Group and Wood Chemistry Group**Purification and characterization of hydrogen peroxide scavenging enzymes from the cyanobacteria *Anacystis nidulans* (*Synechococcus* PCC 6301), *Synechocystis* PCC 6803, and *Anabaena variabilis* PCC 7937**

Start: 01 07 1997
End: 31 10 2000
Financing: FWF, Austrian Science Fund

Scavenging of reactive oxygen species in vegetative cells and protection of nitrogenase in heterocysts of the cyanobacterium *Anabaena variabilis* ATCC 29413.

Start: 01 12 1998
End: 31 11 2001
Financing: FWF, Austrian Science Fund

Scavenging of hydrogen peroxide in nitrogen-fixing cyanobacteria.

Start: 01 12 1998
End: 31 12 2000
Financing: Hochschuljubiläumsstiftung der Stadt Wien

X-ray structure of cyanobacterial catalase-peroxidases

Start: 01 02 1999
End: 31 01 2001
Financing: ÖNB

Developing of inhibitors of human myeloperoxidase

Start: 01 08 2000
End: 31 07 2003
Financing: FWF, Austrian Science Fund

Pro-oxidative effects by mono- and dithiol oxidation mediated by haem peroxidases (EC 1.11. 1.7)

Start: 01 10 1995
End: 28 02 1999
Financing: FWF, Austrian Science Fund

Lignin chemistry and wood anatomy of spruce (*Picea Abies* (L.) Karst.) as important wood quality factors

Start: 01 06 1998
End: 30 11 2000
Financing: FWF, Austrian Science Fund

Produkte aus modifiziertem Holz: Eigenschaften und Marktakzeptanz

Start: 01 10 1999
End: 31 10 2000
Financing: BOKU

Wood K plus: Area 1

Start: 01 10 2000
End: 30 09 2004
Financing: 60% public money
40% industry

Christian Doppler-Laboratory of Pulp Reactivity

4 Project Modules

Start: 01 10 1998
End: 30 09 2005
Financing: Christian-Doppler-Society

Chemie der Aminoxide

Start: 01 05 2001
End: 30 04 2004
Financing: FWF, Austrian Science Fund

Organic Chemistry

ADP-Heptose Analoga

Start: 15 09 2001
End: 14 09 2004
Financing: FWF, Austrian Science Fund

Synthesis of *Acinetobacter* LPS antigens

Start: 01 10 1997
End: 15 11 2000
Financing: FWF, Austrian Science Fund

Chemical synthesis and biological activity of chlamydial lipopolysaccharide

Start: 01 12 1999
End: 30 11 2002
Financing: FWF, Austrian Science Fund

Synthesis of *Toxocara canis* antigens

Start: 01 03 1997
End: 28 02 2001
Financing: ÖAD-Stipendium

Structure elucidation of S-layer glycans

Start: 01 11 1998
End: 30 11 1999
Financing: Hochschuljubiläumsstiftung der Stadt Wien

Synthesis and immunochemical characterization of an RNA-group I specific *Pseudomonas* core lipopolysaccharide antigen

Start: 01 10 1996
 End: 30 09 1999
 Financing: FWF, Austrian Science Fund

Synthesis of nucleotide-activated sugars involved in the biosynthesis of *Pseudomonas* O-antigens

Start: 01 09 2000
 End: 30 06 2001
 Financing: Univ. Guelph

Research Group - Plant Carbohydrates

Stärke-Glucane: Zusammenhänge zwischen Komponenten-, Bulk- und Werkstoffeigenschaften

Start: 01 11 1998
 End: 31 12 2000
 Financing: FWF, Austrian Science Fund

Die Verwendung von Topinamburprodukten in der Nahrungsmittelproduktion zur Herstellung von Spezialbrot und Backwaren

Start: 01 04 1998
 End: 31 12 2000
 Financing: Grenzlandförderungsprojekt für die Arbeitsgemeinschaft der Waldviertler Topinamburanbauer (EU 5b- Projekt)

Relationship between technological value and composition of cereals

Start: 01 01 1995
 End: 31 12 2002
 Financing: Wiss. – techn. Zusammenarbeit Österreich-Polen, Project 16/99, self-financing

Kohlenhydratmetabolismus von Fructanpflanzen unter abiotischem Stress.

Start: 01 01 1995
 End: running
 Financing: self-financing

Strukturuntersuchungen an Fructanen verschiedener pflanzlicher Herkunft

Start: 01 01 1995
 End: running
 Financing: self-financing

Qualitätssicherung von Kartoffelsorten (Vorprojekt)

Start: 01 01 1999
End: 31 12 2001
Financing: self-financing

Nutritional value of the new varieties of Jerusalem artichoke and of their usage in production of functional food

Start: 01 01 2000
End: 31 12 2002
Financing: Wiss. – techn. Zusammenarbeit Österreich-Polen, Project 14/00, self-financing

For more details about Scientific Projects look at http://hal.boku.ac.at/research/en_research_database_search

Cooperation Partners**Analytical Chemistry**

European Joint Research Center IRMM Geel, Belgium

European Space Agency, Netherlands

Institut für Spektrochemie und angewandte Spektroskopie (ISAS), Laboratorium für spektroskopische Methoden in der Umweltanalytik (LSMU), Berlin, Germany

Institute of Nuclear Sciences, Laboratory of Analytical Chemistry, University of Ghent, Belgium

Institut für Ökologische Chemie, Forschungszentrum für Umwelt und Gesundheit, GSF, Neuherberg, Germany

University of Helsinki, Finland

Laboratory of Inorganic Chemistry, ETH Zürich, Switzerland

Dept. of Material Science and Engineering, Muroran Institute of Technology, Muroran, Japan

Old Dominion University Norfolk, USA

Quaternary Research Center, University of Washington, Seattle, USA

Department of Archaeological Biology and Anthropology, Museum of Natural History, Austria

Institute of Analytical Chemistry, University of Technology Vienna, Austria

Institute of Analytical Chemistry, University of Technology Graz, Austria

Institut for Forensic Medicine, University of Vienna, Austria

Academy of Fine Arts, Vienna, Austria

Austrian Research Center, ARC, Seibersdorf, Austria

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Laboratorium für Umweltanalytik GmbH, Austria

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Institut für Botanik, University of Agricultural Sciences, Vienna, Austria

Institut für Waldökologie, University of Agricultural Sciences, Vienna, Austria

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Biochemistry A / Glycobiology

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Utrecht University, Utrecht, Netherlands

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Dr. Anabella Ivancich, Section de Bioenergetique, URA CNRS, Saclay, France
Prof. Dr. R. Huber, Max-Planck-Institut für Biochemie, Protein Crystallographie, Martinsried, Germany
Dr. A. J. Kettle, Christchurch School of Medicine, New Zealand
Prof. Dr. J. Schaur, Inst. of Biochemistry, Graz, Austria
Dr. Jürgen Arnhold, Institute of Medical Physics and Biophysics, University of Leipzig, Germany
Prof. Dr. W. H. Koppenol, Inst. f. Anorg. Chemie, ETH Zürich, Switzerland
Prof. Dr. B. H. Dunford, Inst. of Chemistry, University of Alberta, Edmonton, Canada
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Prof. Dr. Ron Wever, University of Amsterdam, The Netherlands
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Dr. B. Lendl, Institute of Analytical Chemistry, Technical University Vienna, Austria
Prof. Dr. Rupert Wimmer, University of Agricultural Sciences Vienna, Institute of Botany, Austria
Prof. Dr. Stefanie Tschegg, Institute of Meteorology & Physics, University of Agricultural Sciences, Austria

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Prof. Dr. O. Glatter, Institute of Chemistry, University Graz: Light and X-ray scattering techniques

Prof. Dr. J.S. Gratzl, Prof. Dr. C.L. Chen, Department of Wood and Paper Science, North Carolina State University, Raleigh, USA: lignin chemistry, cellulose chemistry, yellowing

Prof. Dr. S. Tschegg, Institute of Physics, University of Agricultural Sciences, Vienna: electron microscopy

Prof. Dr. W. Kunz, Dr. R. Buchner, Institute of Physical and Theoretical Chemistry, University of Regensburg, Germany: Dielectric relaxation spectroscopy

Prof. Dr. H. Nohl, Dr. L. Gille, Institute of Pharmacology and Toxicology, Veterinary University Vienna: EPR spectroscopy, radical trapping

Prof. Dr. R. Lechner, Institute for Electrochemistry, Technical University Vienna: cycl. Voltammetry

Prof. Dr. Binder, Institute for Chemical Technology of Organic Substances, Technical University of Vienna: CPMAS

Prof. H. Langhals, Institut für Organische Chemie und Makromolekulare Chemie der Ludwig-Maximilian Universität München, BRD: Fluoreszenzfarbstoffe

Prof. Dr. Treimanis, State institute of Wood Chemistry, University Riga, Estonia

Prof. Dr. C. Jäger, Inst. für Optik und Quantenelektronik, Univ. Jena, CPMAS

Dr. Hans-Peter Fink, Fraunhoferinstitut für angewandte Polymerforschung, Teltow, CPMAS

Prof. Dr. Jürgen Einfeldt, Univ. Rostock, dielektrische Relaxationsspektroskopie

Prof. Dr. Netzer, Institut für Experimentalphysik, Univ. Graz (XPS-Messungen)

Organic Chemistry

Prof. Dr. Helmut Brade, (Serology and enzymology of LPS) Forschungszentrum Borstel

Parkallee 22, D-23845 BORSTEL, Germany

IFA –Tulln (A. Loibner and R. Krska), Synthesis of reference materials (Lindane metabolites and mycotoxins)

Prof. Dr. Tomas Peters, (Transfer-NOE measurements) Institut für Chemie Med. Universität zu Lübeck
Ratzeburger Allee 160, D-23538 Lübeck, Germany

Dr. Malcolm Walkinshaw, (X-ray crystallography) Dept. of Biochemistry, University of Edinburgh, Edinburgh EH 8 9XB, UK

Prof. Dr. Klaus Bock, (High-field-nmr) Carlsberg Laboratories, Dept. Of Chemistry, DK-2500 Valby, DK

Prof. Dr. Stephen Evans, (Crystallography) University of Ottawa, K1H8M5, Ottawa, Canada

Prof. Dr. Nathan Sharon, Department of Membrane Research and Biophysics, Weizmann Institute of Science, 76100 Rehovot, Israel

Prof. Dr. Rick Maizels, Department of Zoology and Animal Genetics (Immunochemistry of parasites), University of Edinburgh, Edinburgh EH 8 9XB, UK

Prof. Dr. Paul Messner, Zentrum für Ultrastrukturforschung, University of Agricultural Sciences Vienna A-1180 Wien, Austria

Prof. Dr. Bernd Nidetzky, Institut für Lebensmitteltechnologie, University of Agricultural Sciences, A-1190 Wien, Austria

Prof. Dr. Margit Sara, Zentrum für Ultrastrukturforschung, University of Agricultural Sciences Vienna, A-1180 Vienna, Austria

Prof. Dr. Joseph S. Lam and Prof. Dr. Miguel Valvano, Department of Microbiology, University of Guelph, Canada

Prof. Dr. William G. Coleman jr., NIH, Institute of Diabetes and digestive and kidney diseases, USA

Research Group Plant Carbohydrates

Prof. Dr. Anton Huber, Department of Polymer-Characterization, Institute of Chemistry, KF-University, Graz

Prof. Liebhard, Institute of Agronomy and Plant Breeding, University of Agricultural Sciences Vienna, Austria

Prof. Berghofer, Institute of Food-and Biotechnology, University of Agricultural Sciences Vienna, Austria

IFA-Tulln, Centre of Analytical Chemistry, Austria

Dr. Soja and Dipl.Ing. Schmidt, Research Centre Seibersdorf, Institute of Life Science, Austria

Bundesamt und Forschungszentrum für Landwirtschaft, Vienna, Austria

Bundesamt für Landwirtschaft, Gumpenstein, Irdning, Austria

Inulinia-Stift Ges.m.b.H., Eggendorf, Austria

Prof. Wiedenroth/Dr. Albrecht, Humboldt-University of Berlin, Institute of General Botany, Berlin, Germany,

Prof. Cieslik, Doz. Novotna, Agricultural University Cracow, Institute of Human Nutrition and Institute of Carbohydrate Technology, Cracow, Poland

Research Institute of Forest and Rangelands, Karaj, Iran

Fa. Cerestar, Vilvoorde, Belgium

Publications

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ALTMANN, F. LEITER, H., MUCHA, J., STAUDACHER, E., GLÖßL, J. 1999. Fukosyltransferase-Gen. Austrian Patent A 270/99

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MAAHEIMO, H., KOSMA, P., BRADE, L., BRADE, H. and PETERS, T. 2000. Mapping the binding of synthetic disaccharides representing epitopes of chlamydial lipopolysaccharide to antibodies with NMR. Biochemistry (USA). 39. 12778-12788.

KOSMA, P., REITER, A., HOFINGER, A., BRADE, L., and BRADE, H. 2000. Synthesis of neoglycoproteins containing Kdo epitopes specific for *Chlamydomphila psittaci* lipopolysaccharides. J. Endotoxin Res. 6. 57-69.

ZAMYATINA, A., GRONOW, S., COERTELT, C., PUCHBERGER, M., BRADE, H., and KOSMA, P. 2000. Efficient chemical synthesis of the two anomers of ADP L-glycero- and D-glycero-D-manno-heptopyranose allows the determination of the substrate specificities of bacterial heptosyl transferases. Angew. Chem. Int. Ed. 39. 1450-1453.

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WIMMER, N., BRADE, H., and KOSMA, P. 2000. Synthesis of neoglycoproteins containing D-glycero-D-talo-oct-2-ulopyranosylonic acid (Ko) ligands corresponding to core units from *Burkholderia* and *Acinetobacter* lipopolysaccharide. *Carbohydr. Res.* 329. 549-560.

1999

REITER, A., ZAMYATINA, A., SCHINDL, H., HOFINGER, A., and KOSMA, P. 1999. Synthesis of *Pseudomonas aeruginosa* lipopolysaccharide core antigens containing 7-O-carbamoyl-L-glycero-D-manno-heptopyranosyl residues. *Carbohydr. Res.* 317. 39-52.

KOSMA, P. 1999. Chlamydial lipopolysaccharide. Special issue on molecular basis of glycoconjugate diseases. *Biochim. Biophys. Acta* 1455. 387-402.

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KOSMA, P., REITER, A., ZAMYATINA, A., WIMMER, N., GLÜCK, A. and H. BRADE. 1999. Synthesis of inner core antigens related to *Chlamydia*, *Pseudomonas* and *Acinetobacter* LPS. *J. Endotoxin Res.* 5. 157-163.

HASELHORST, T., ESPINOSA, J.-F., JIMENEZ-BARBERO, J., SOKOLOWSKI, T., KOSMA, P., BRADE, H., BRADE, L., and PETERS, T. 1999. NMR-experiments reveal distinct antibody-bound conformations of a synthetic disaccharide representing a general structural element of bacterial epitopes. *Biochemistry* 38. 6449-6459.

SÁNCHEZ CARBALLO, P. M., ZÄHRINGER, U., KOSMA, P. and RIETSCHEL, E. T. 1999. Elucidation of the structure of an alanine-lacking core tetrasaccharide triphosphate from the lipopolysaccharide of *Pseudomonas aeruginosa* mutant H4. *Eur. J. Biochem.* 261. 500-508.

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1998

BARTEK, J., MÜLLER, R. and KOSMA, P. 1998. Synthesis of a neoglycoconjugate containing the Lewis X analogue β -D-GalpNAc-(1-4)[β -L-Fucp(1-3)] β -D-GlcNAc determinant. *Carbohydr. Res.* 308. 259-273.

SOKOŁOWSKI, T., HASELHORST, T., SCHEFFER, K., WEISEMANN, R., KOSMA, P., BRADE, H., BRADE, L. and PETERS, T. 1998. Conformational analysis of the disaccharide α -D-Kdo-(2 \rightarrow 8)- β -D-Kdo-(2 \rightarrow O)-allyl in aqueous solution and bound to a monoclonal antibody. *J. Biomol. NMR.* 12. 123-133.

SCHMID, J., ELLINGER, I. and KOSMA, P. 1998. In vitro fusion of tissue-derived endosomes and lysosomes. *Eur. J. Cell. Biol.* 77. 166-174.

Organic Chemistry: Books and book chapters

1999

KOSMA, P. 1999. Chemical synthesis of core structures. *In* Endotoxin in Health and Disease, Brade, H., Opal, S., Vogel, S., Morrison, D. eds., Marcel Dekker, New York, Basel, 257-281.

Christian Doppler-Laboratory of Pulp Reactivity

Original articles and reviews in refereed journals

2000

POTTHAST, A., ROSENAU, T., KOSMA, P., SCHELOSKY, N., and BALDINGER, T. 2000. Thermal reactions of *N*-Methylmorpholine-*N*-oxide (NMMO): A general method for separation and quantification of *N*-Methylmorpholine-*N*-oxide and its main degradation products *N*-Methylmorpholine and Morpholine by Capillary Electrophoresis (CE). *Holzforschung* 54. 641-646.

POTTHAST, A., ROSENAU, T., KOSMA, P., CHEN, C.L., and GRATZL, J.S. 2000. Confirmation of the presence of formaldehyde and *N*-(methylene)morpholinium cations as reactive species in the Cellulose/NMMO/Water system by trapping reactions. *Holzforschung* 54. 101-103.

CHEN, C.L., POTTHAST, A., ROSENAU, T., GRATZL, J.S., KIRKMAN, A.G., NAGAI, D., and MIYAKOSHI, T. 2000. Laccase-catalyzed oxidation of 1-(3,4-dimethoxyphenyl)-1-propene using ABTS as mediator. *J Mol. Catal. B: Enzymatic* 8. 213-219.

ROSENAU, T., POTTHAST, A., KOSMA, P. 2000. A general method for the quantification of NMMO and its main degradation products by capillary electrophoresis. *Lenzinger Ber.* 80. 102-107.

POTTHAST, A., ROSENAU, T., KOSMA, P. 2000. Heterolytic reactions in the system NMMO / Cellulose / Water. *Lenzinger Ber.* 80. 92-96.

RÖDER, T., MORGENSTERN, B., GLATTER, O. 2000. Light-scattering studies on solutions of cellulose in *N,N*-Dimethylacetamide / Lithium chloride. *Lenzinger Ber.* 80. 97-101.

RÖDER, T., MORGENSTERN, B., GLATTER, O. 2000. Polarized and depolarized light scattering on solutions of cellulose in dimethylacetamide / lithium chloride. *Macromol. Chem. Physics, Macromolecular Symposia* 162. 87-93.

ARNDT, K.-F., MORGENSTERN, B., RÖDER, T. 2000. Scattering function of unsubstituted cellulose dissolved in *N*-Methylmorpholine-*N*-oxide monohydrate. *Macromol. Chem. Physics, Macromolecular Symposia* 162. 109-119.

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ROSENAU, T., POTTHAST, A., KOSMA, P., CHEN, C. L., and GRATZL, J. S. 1999. Autocatalytic decomposition of *N*-Methylmorpholine-*N*-oxide induced by Mannich intermediates. *J. Org. Chem.* 64. 2166-2167.

ROSENAU, T., POTTHAST, A., EBNER, G., and KOSMA, P. 1999. Deoxygenation of amine oxides by in-situ-generated formic pivalic anhydride. *Synlett.* 5. 623-625.

ROSENAU, T., HABICHER, W., POTTHAST, A., and KOSMA, P. 1999. Novel tocopherol compounds XI. Synthesis, bromination and oxidation reactions of 3-(5-Tocopheryl)propionic acid. *Synlett.* 3. 291-294.

ROSENAU, T., POTTHAST, A., and KOSMA, P. 1999. A concise synthesis of *N*-(Trideuteromethyl)morpholine-*N*-oxide monohydrate. *Synlett.* 12. 1972-1974.

SCHELOSKY, N., RÖDER, T., SIXTA, H., BALDINGER, T., MILACHER, W., and MORGENSTERN, B. 1999. Molecular mass distribution of cellulosic products by size exclusion chromatography in DMAc / LiCl. *Das Papier.* 53. 728-738.

CHEN, C.-L., POTTHAST, A., ROSENAU, T., GRATZL, J. S., KIRKMAN, A. G., NAGAI, D., and MIYAKOSHI, K. T. 1999. Laccase-catalyzed oxidation of 1-(3,4-dimethoxyphenyl)-1-propene using ABTS as mediator. *J. Mol. Catal. B: Enzymatic.* 314.

RÖDER, T., and MORGENSTERN, B. 1999. The influence of activation on the solution state of cellulose dissolved in *N*-Methylmorpholin-*N*-oxide monohydrate. *Polymer* 40. 4143.

Research Group - Plant Carbohydrates

Original articles and reviews in refereed journals

2000

BAUMGARTNER, S., DAX, TH. G., PRAZNIK, W., and FALK H. 2000. Characterisation of the high-molecular weight fructan isolated from garlic (*Allium sativum* L.). *Carbohydr. Res.* 328. 177-183.

NOWOTNA, A., GAMBUS, H., PRAZNIK, W., PUZIA, R., and ZIOBRO, R. 2000. Characteristics of soluble and insoluble fractions of gels prepared from starches of various botanical origin segregated according to granule size. *Electronic Journal of Polish Agricultural Universities, Food Science and Technology*, 3. 1.

1999

PRAZNIK, W., MUNDIGLER, N., KOGLER, A., WOLLERDORFER, M., PELZL, B., and HUBER, A. 1999. Molecular background of technological properties of selected starches. *Starch/Stärke*, 51. 6. 197-211.

PRAZNIK, W., CIESLIK, E., and FILIPIAK-FLORKIEWICZ, A., 1999. Correlation between the levels of nitrates, nitrites and vitamin C in Jerusalem artichoke tubers. *Scandinavian Journal of Nutrition, Supplement*. 34. 49.

ZELENY, R., ALTMANN, F., and PRAZNIK, W. 1999. Structural characterization of the N-linked oligosaccharides from tomato fruit. *Phytochemistry* 51. 199-210. (see also *Biochemistry A*)

1998

CIESLIK, E., and PRAZNIK, W. 1998. Changes of glycoalkaloid content in potato tubers of selected varieties during vegetation and storage. *Pol. J. Food Nutr. Sci.* 7/48. 417-422.

Research Group - Plant Carbohydrates

Books and book chapters

1999

HUBER, A., and PRAZNIK, W. 1999. Analytical and Preparative Columns for Aqueous Size Exclusion Chromatography of Polysaccharides. *In: Column Handbook for Size Exclusion Chromatography* eds. Chi-san Wu), Academic Press, Chpt.16, 459-497.

1998

HUBER, A. and PRAZNIK, W. 1998. Dimensions and structural features of aqueous dissolved polymers *In: Carbohydrate as Organic Raw Materials IV* (eds Praznik, W., and Huber, A.) WUV- Universitätsverlag, Wien, Chpt.: 19. 230-246.

Research Group - Plant Carbohydrates

Technical and project reports

2000

PRAZNIK, W., and STIFT, H. 2000. Die Verwendung von Topinamburprodukten in der Nahrungsmittelproduktion zur Herstellung von Spezialbrot und Backwaren. Abschlussbericht des Beratungs-, Forschungs- und Entwicklungsprojekt für die Verarbeitung und Vermarktung von Topinamburknollen.

Publications are also available at http://hal.boku.ac.at/research/en_research_database.search

Scientific Presentations

Analytical Chemistry

2000

HANN, S., ZENKER, A., GALANSKI, M., BEREUTER, T. L., STINGEDER, G., KEPPLER, B. K. 2000. Untersuchungen zur Wechselwirkung von Cisplatin mit Guanosinmonophosphat mittels HPIC-UV-ICP-SFMS 5. Symposium Massenspektrometrische Verfahren der Elementspurenanalyse & 16. ICP-MS Anwendertreffen, Juelich, Germany. lecture

KÖLLENSPERGER, G., HANN, S., PRINZ, G., STINGEDER, G., BUJATTI-NARBESHUBER, M. 2000. Bestimmung von Iridiumspuren in Kőfelsitgestein mittels Sektorfeld-Massenspektrometrie mit Induktiv gekoppeltem Plasma als Ionisierungsquelle. 5. Symposium Massenspektrometrische Verfahren der Elementspurenanalyse & 16. ICP-MS Anwendertreffen, Juelich, Germany. lecture

NELMS, S., QUÉTEL, C., PROHASKA, T., VOGL J., AND TAYLOR, P. D. P. 2000. Detector dead time correction for ICP-MS: a critical review. 5. Symposium Massenspektrometrische Verfahren der Elementspurenanalyse & 16. ICP-MS Anwendertreffen, Juelich, Germany. lecture

QUÉTEL, C., HELD, A., PROHASKA, T., WELLM R., AND TAYLOR, P. D. P. 2000. Application of magnetic sector multi collector ICPMS instrumentation to uranium measurements for environmental nuclear safeguards. 5. Symposium Massenspektrometrische Verfahren der Elementspurenanalyse & 16. ICP-MS Anwendertreffen, Juelich, Germany. lecture

HANN, S., NURMI, J., KRACHLER, M., PROHASKA, T., KOELLENSPERGER G., AND STINGEDER G. 2000. Multielementanalytik von Fruchtwasser mittels ICP-SMS.

5. Symposium Massenspektrometrische Verfahren der Elementspurenanalyse & 16. ICP-MS Anwendertreffen, Juelich, Germany. poster

PROHASKA, T. 2000. Application and quality of ICP-MS.

7th Durham Conference, Durham, UK. invited lecture

QUÉTEL, C., PROHASKA, T., NELMS, S., DIEMER, J. AND TAYLOR, P. 2000. ICPMS applied to isotope abundance ratio measurements: performance study and development of a method for combining uncertainty contributions from measurement correction factors.

7th Durham Conference, Durham, UK. lecture

NELMS, S., PROHASKA, T., QUÉTEL C., AND TAYLOR, P. 2000. Comparison of MC-ICP-MS with quadrupole ICP-MS for the certification of the amount content and isotopic composition of enriched ²⁰⁶Pb and ²⁰³Tl materials, using isotope dilution.

7th Durham Conference, Durham, UK. lecture

KÖLLENSPERGER, G., PUXBAUM, H. 2000. Analytik und Umweltrelevanz von Elementen der Platingruppe.

Meßtechnikertage, Bozen, Italy, invited lecture

TESCHLER-NICOLA, M., PROHASKA, T., WATKINS, M., GEROLD, F., LATKOCZY, C., STINGEDER, G. 2000. Stable strontium isotope ratio measurements in prehistoric Austrian human bone samples – an interdisciplinary research project.

12th Congress of the European Anthropological Association, Millennial Perspectives: Past, Present and Future, Cambridge, England. poster

TESCHLER-NICOLA, M., PROHASKA, T., GEROLD, F., WATKINS, M., LATKOCZY, C., STINGEDER, G. 2000. Strontium-Isotopenverhältnis in (prä)historischen Skelettserien Ostösterreichs – ein interdisziplinäres Forschungsprojekt.

4. Kongress der Gesellschaft für Anthropologie, „Homo – unsere Herkunft und Zukunft“, Potsdam, Germany. poster.

HANN, S., KRACHLER, M., NURMI, J., ROSSIPAL, E., PROHASKA, T., KÖLLENSPERGER, G., STINGEDER, G. 2000. Analyse von Spurenelementen und Schwermetallen in Fruchtwasserproben mittels ICP-SFMS Seminar "Instrumentelle Analytik", Allgemeines Krankenhaus, Vienna, Austria. invited lecture

HANN, S., ZENKER, A., STINGEDER, G. 2000. Study of cisplatin interaction with guanosine monophosphate by HPIC-ICP-SFMS.

1st Intl. Conference on HR-ICPMS, Norfolk, Virginia, USA. lecture

PROHASKA T. 2000. Application of HR-ICPMS in ultratrace analysis and the role of certified reference materials.

1st Intl. Conference on HR-ICPMS, Norfolk, Virginia, USA. invited plenary lecture, chair of the session instrumentation

NELMS, S., PROHASKA, T., QUÉTEL, C., VOGL, J., AND TAYLOR, P. 2000. Evaluation of different detector deadtime models for ICP-MS

1st Intl. Conference on HR-ICPMS", Norfolk, Virginia, USA. lecture

TESCHLER-NICOLA, M., PROHASKA, T., LATKOCZY, C., GEROLD, F., WATKINS, M., STINGEDER G. 2000. Strontium isotope ratio measurements in prehistoric Austrian human bone samples using high-resolution inductively-coupled plasma spectrometry (HR-ICPMS)

69th Annual Meeting der AAPA, Session Skeletal Biology XII „Old world and new world perspectives on Bioarchaeology (Am. Ass. of Phys. Anthrop. und Deutsche Gesell. f. Anthrop.), San Antonio, Texas, USA. invited lecture

KÖLLENSPERGER, G., HANN S., AND STINGEDER, G. 2000: Ultratrace analysis of PGE by ICP-SMS.

HP – Forum Analytik 2000, Vienna, Austria. poster

LATKOCZY, C., PROHASKA, T., THORROLD, S., AND JONES, C. 2000. Analysis of stable isotope markers in fishbones by ICP-SMS.

Plasma Winter Conference 2000, Ft.Lauderdale, USA. lecture

Köllensperger, G., Hann, S., Stingeder, G. 2000. Platinum group elements in environmental matrices - Capabilities and limitations of ICP-SMS.

Plasma Winter Conference 2000, Ft.Lauderdale, USA. Poster

1999

PROHASKA, T., QUÉTEL, C. R., LIESEGANG, D., HENNESSY, C., TAYLOR, P. 1999. Certification of Cd, Cu, Cr, and Pb in sediment and fly ash candidate certified reference materials by IDMS ICP-MS.

FACSS conference, Vancouver, Canada. poster

LATKOCZY, C., PROHASKA, T., STINGEDER, G., TESCHLER-NICOLA, M. 1999. Application of ICP-SMS for isotope ratio measurements.

FACSS conference, Vancouver, Canada. lecture

QUÉTEL, C. R., PROHASKA, T., TAYLOR, P., VOGL, J., NELMS, S. 1999. U isotope ratio measurements by ICP-MS.

FACSS conference, Vancouver, Canada. invited lecture

NELMS, S., QUÉTEL, C. R., VOGL, J., PROHASKA, T., TAYLOR, P. D. 1999. Investigation of accurate deadtime determination in ICP-MS.

FACSS conference, Vancouver, Canada. poster

HANN, S., PROHASKA, T., LATKOCZY, C., KÖLLENSPERGER G., STINGEDER, G. 1999. Abtrennung spektraler und nichtspektraler Interferenzen mittels HPIC-ICP-SMS zur genauen Bestimmung von Thorium und Uran in mineralischen Rohstoffen.

15. ICP MS Anwendertreffen am IFW Dresden, Germany. lecture

KÖLLENSPERGER, G., HANN S., STINGEDER, G. 1999. Spurenanalytik von Platinmetallen in silikathaltigen Matrices mittels Sektorfeldmassenspektrometrie mit induktiv gekoppeltem Plasma als Ionisierungsquelle - Möglichkeiten und Limitierungen.

15. ICP MS Anwendertreffen am IFW Dresden, Germany. lecture

WATKINS, M., LATKOCZY, C., PROHASKA, T., STINGEDER, G., WENZEL, W. W. 1999. Application of stable Isotope ratio measurements in Soil Science.

ICOBTE 99, Vienna, Austria. lecture

PROHASKA, T. 1999. The versatility of an HR-ICPMS for environmental investigations.

ICPMS workshop Finnigan MAT, Breda, The Netherlands. invited lecture

HANN, S., PROHASKA, T., LATKOCZY, C., KÖLLENSPERGER G., and STINGEDER, G. 1999. Determination of rare earth elements, Th and U in silicate containing matrices by inductively coupled plasma sectorfield mass spectrometry after digestion with HCl/HNO₃/HF/H₃BO₃.

ANAKON '99, Konstanz, Germany. poster

WATKINS, M., PROHASKA, T., LATKOCZY, C., STINGEDER, G., TESCHLER-NICOLA, M. 1999. Präzise Isotopenmessungen für anthropologische Fragestellungen.

"10. MS Diskussions-veranstaltung", Vienna, Austria. lecture

PROHASKA, T., LATKOCZY, C., STINGEDER, G. 1999. The utility of novel applications for a high resolution ICP sectorfield MS (HR-ICP-SFMS) for precise determination of isotope ratios in tracer studies.

HP – Forum Analytik, Vienna, Austria. poster

PROHASKA, T., KOELLENSPERGER, G., KRACHLER, M., DE WINNE, K., STINGEDER, G., MOENS, L. 1999. Accurate determination of trace elements in human milk samples by ICP sector field MS (ICP-SFMS).

HP – Forum Analytik, Vienna, Austria. poster

LATKOCZY, C., PROHASKA, T., WATKINS, M., STINGEDER, G., TESCHLER-NICOLA, M. 1999. Online matrix separation by coupling HPLC to an ICP sectorfield MS (HPLC-ICP-SFMS) for accurate strontium isotopic ratio determination in prehistoric samples.

HP – Forum Analytik, Vienna, Austria. poster

HANN, S., KOELLENSPERGER, G., PROHASKA, T., STINGEDER, G., 1999. Determination of rare earth elements (REE), U and Th traces in technological REE samples by online coupling of ion chromatography to an ICP-MS (HPLC-ICP-MS).

HP – Forum Analytik, Vienna, Austria. poster

PROHASKA, T., LATKOCZY, C., STINGEDER, G. 1999. The utility of novel applications for a high resolution ICP sectorfield MS (HR-ICP-SFMS) for precise determination of isotope ratios in tracer studies.

Plasma Winter Conference 99, Pau, France. poster – **prize for the best contribution in the session**

PROHASKA, T., KOELLENSPERGER, G., KRACHLER, M., DE WINNE, K., STINGEDER, G., MOENS, L. 1999. Accurate determination of trace elements in human milk samples by ICP sector field MS (ICP-SFMS).

Plasma Winter Conference 99, Pau, France. poster

LATKOCZY, C., PROHASKA, T., WATKINS, M., STINGEDER, G., TESCHLER-NICOLA, M. 1999. Online matrix separation by coupling HPLC to an ICP sectorfield MS (HPLC-ICP-SFMS) for accurate strontium isotopic ratio determination in prehistoric samples.

Plasma Winter Conference 99, Pau, France. poster

HANN, S., KOELLENSPERGER, G., PROHASKA, T., STINGEDER, G. 1999. Determination of rare earth elements (REE), U and Th traces in technological REE samples by online coupling of ion chromatography to an ICP-MS (HPLC-ICP-MS).

Plasma Winter Conference 99, Pau, France. poster

1998

TESCHLER-NICOLA, M., GEROLD, F., LATKOCZY, C., PROHASKA, T., STINGEDER, G. 1998. Evidence of genocide 7000 BP – Neolithic paradigm and geoclimatic reality.

Current Topics in European Anthropology. Twenty fifth School of Biological Anthropology. Zagreb, Croatia. invited lecture

PROHASKA, T., STOPPER, S., STINGEDER, G., PUXBAUM, H. 1998. Trace and ultratrace analysis on dry and wet deposition samples by ICP-SMS. Seminar on Environmental Analytical Chemistry of the Institute of Analytical Chemistry – TU Vienna, Vienna, Austria. invited lecture

TESCHLER-NICOLA, M. GEROLD, F., LATKOCZY, C., PROHASKA, T., STINGEDER, G. 1998. Das Massaker von Schletz. Südtiroler Kulturwoche. Traismauer, Austria. invited lecture

PROHASKA, T., STINGEDER, G., PONGRATZ, R., PFEFFER, M., MENTLER, A. 1998. Speziierung von Arsen in Flüssig- und Gasphase mit ICPMS. ICPMS Anwendertreffen 1998. Mainz, Germany. poster

HANN, S., KÖLLENSPERGER, G., PROHASKA, T., STINGEDER, G. 1998. Bestimmung von U und Th in technologischen Materialien mittels HPLC-ICPMS. ICPMS Anwendertreffen 1998. Mainz, Germany. poster

PROHASKA, T., HANN, S., STINGEDER, G., 1998. Determination of REE, U and Th in biological and geological samples by high resolution ICP-SFMS. 6th International Conference on Plasma Source Mass Spectrometry, Durham, UK. lecture

LATKOCZY, C., PROHASKA, T., STINGEDER, G., TESCHLER-NICOLA, M. 1998. Strontium isotope ratio measurements of prehistoric human bone samples by means of ICP-SFMS.

6th International Conference on Plasma Source Mass Spectrometry. Durham, UK. lecture – prize for the best contribution to the conference

TESCHLER-NICOLA, M., GEROLD, F., LATKOCZY, C., PROHASKA, T., STINGEDER, G. 1998. Neolithisches Paradigma und geoklimatische Realität.

2. wissenschaftliche Tagung der Gesellschaft für Archäozoologie und Prähistorische Anthropologie (GAPA). Braunschweig, Germany. invited lecture

WENZEL, W. W., BRANDSTETTER, A., JOCKWER, F., PROHASKA, T., STINGEDER, G., and WUTTE, H. 1998. Arsen in Böden Österreichs.

Expertentagung der Arbeitsgruppe Bodenschutz. St. Veit a.d. Glan, Austria.

PROHASKA, T., STINGEDER, G., PONGRATZ, R., PFEFFER, M., MENTLER, A. 1998. Speciation of arsenic in the soil–water–gas–system by IC, HG and GC using HR-ICPMS as powerful detection unit.

Trace Element Speciation in Biomedical, Nutritional and Environmental Sciences, München, Germany. lecture

JOCKWER, F., LOMBI, E., KIRCHBAUMER, N., PROHASKA, T., WENZEL, W. W., SLETTEN, R. S., und STINGEDER, G. 1998. Eine neue Methode zur sequentiellen Extraktion von Arsen in Böden.

Workshop zum Arsenprojekt im Rahmen der ÖBG, Vienna, Austria. poster

TULIPAN, M., PFEFFER, M., MENTLER, A., PROHASKA, T., PONGRATZ, R., und STINGEDER, G. 1998. Mikrobielle Arsen-Umsetzungen in Böden.

Workshop zum Arsenprojekt im Rahmen der ÖBG. Vienna, Austria. poster

PROHASKA, T., LATKOCZY, C., STINGEDER, G., WENZEL, W. W., 1998. Measurement of arsenic in soil extracts by HR-ICPMS.

Workshop zum Arsenprojekt im Rahmen der ÖBG, Vienna, Austria. poster

PONGRATZ, R., PROHASKA, T., STINGEDER, G., MENTLER, A., PFEFFER, M. 1998. Arsenspeziation in Bodenproben mittels HPLC-HR-ICPMS.

Workshop zum Arsenprojekt im Rahmen der ÖBG, Vienna, Austria. poster

BRANDSTETTER, A., WENZEL, W. W., LOMBI, E., AHMED, M., PROHASKA, T. and STINGEDER, G. 1998. Beurteilung der Arsenverteilung und -mobilität in belastenden Standorten Österreichs. Arsen in Böden Österreichs

Workshop zum Arsenprojekt im Rahmen der ÖBG, Vienna, Austria. poster

STINGEDER, G. Feb 1998. ICP-Massenspektrometrie und deren Anwendungen. 9. Massenspektrometrische Diskussionsveranstaltung,

Institute of Analytical Chemistry, Vienna University, Vienna, Austria. Invited lecture

TESCHLER-NICOLA, M., GEROLD, F., LATKOCZY, C., PROHASKA, T., and STINGEDER, G. 1998. Die frühneolithische Siedlung von Aspam/Schletz. Die anthropologische Spurensicherung als wesentlicher Teil der Geschichtsrekonstruktion.

Gesellschaft für Archäologie, Landau, Austria. invited lecture

VANHAECKE, F., DE WANNEMACKER, G., LATKOCZY, C., MOENS, L., and DAMS, R. 1998. Accurate isotope ratio determination by means of quadrupole-based and double -focusing magnetic sector ICP-mass spectrometry.

1998 Winter Conference on Plasma Spectrochemistry, Scottsdale, Arizona, USA. Lecture

Biochemistry A / Glycobiology

2000

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Christian Doppler-Laboratory of Pulp Reactivity

2000

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MACKIE, I.D. , RÖHRLING, J., GOULD, R.O., WALKINSHAW, M., POTTHAST, A., ROSENAU, T., KOSMA, P. 2000. Crystal and molecular structure of methyl 4-O-methyl- -D-glucopyranosyl-(1-4)- -D-glucopyranoside. Abstracts (ed. J. Thiem, ISBN 3-00-006293-9) of 20th Int. Carbohydrate Symposium, Hamburg, Germany. poster A 182.

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RÖDER, T., MORGENSTERN, B., GLATTER, O. 2000. Charakterisierung des Lösungszustands von Cellulose in *N*-Methyl-morpholin-*N*-oxid. 39. Internationale Chemiefasertagung, Dornbirn, Austria. lecture

ROSENAU, T. 2000. (Internationaler Lyocell-Preis). Chemical reactions in the system cellulose/NMMO/water. 4th Int. Symposium, Alternative Cellulose Manufacturing, Forming, Properties TITK Rudolstadt-Schwarza, Germany. lecture

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1999

POTTHAST, A., ROSENAU, T., and KOSMA, P. 1999. The chemistry of the cellulose/NMMO/water system. Heterolytic reactions I. Advances in Wood Chemistry, Int. Symposium, Vienna, Austria. abstr. P-20

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Organic Chemistry

2000

KOSMA, P. 2000. Chemische Synthese und bioaktive Konformation komplexer Kohlenhydratantigene Gram-negativer Bakterien. GÖCH-Vortrag, Univ. Innsbruck, Austria. lecture

WIMMER, N., GLÜCK, A., and KOSMA, P. 2000. Synthesis of neoglycoproteins containing D-*glycero*-D-*tal*-oct-2-ulo-pyranosylonic acid (Ko) ligands corresponding to the inner core of *Burkholderia* and *Acinetobacter* LPS. XIIIth Kdo-Meeting, Research Center Borstel, Germany.

SANCHEZ-CARBALLO, P.M., BRADE, L., KOSMA, P., and ZÄHRINGER, U. 2000. Chemical and serological analysis on the core region of *Pseudomonas aeruginosa* lipopolysaccharide. Abstracts (ed. J. Thiem, ISBN 3-00-006293-9) of 20th Int. Carbohydrate Symposium, Hamburg, Germany. C 119.

OERTELT, C., GRONOW, S., ZAMYATINA, A., ERVELÄ, E., SKURNIK, M., KOSMA, P., BRADE, H., HOLST, O. 2000. ADP L-*glycero*-D-*manno*-heptose is the physiological substrate for heptosyltransferases I and II during LPS Core biosynthesis. Abstracts (ed. J. Thiem, ISBN 3-00-006293-9) of 20th Int. Carbohydrate Symposium, Hamburg, Germany. A 180.

ZAMYATINA, A., COERTELT, C., GRONOW, S., PUCHBERGER, M., BRADE, H., and KOSMA, P. 2000. Chemical synthesis of two anomers of ADP L-*glycero*- and D-*glycero*-D-*manno*-heptopyranose as substrates for bacterial heptosyl transferases. Abstracts (ed. J. Thiem, ISBN 3-00-006293-9) of 20th Int. Carbohydrate Symposium, Hamburg, Germany. B 173.

AMER, H., HOFINGER, A., PUCHBERGER, M., MAIZELS, R.M., KOSMA, P. 2000. Chemical synthesis of trisaccharide epitopes of excretory / secretory antigen of *Toxocara canis*. Abstracts (ed. J. Thiem, ISBN 3-00-006293-9) of 20th Int. Carbohydrate Symposium, Hamburg, Germany. B 184.

SCHÄFFER, T., SCHERF, T., CHRISTIAN, R., KOSMA, P., ZAYNI, S., MESSNER, P., SHARON, N. 2000. Purification and structure elucidation of the N-acetylglucosamine-containing polysaccharide from *Bacillus licheniformis* ATCC 9945 using 800 MHz NMR spectroscopy. Glycobiology 2000, Boston USA. Abstract 168, Glycobiology, 10. 1122-1123.

HOFINGER, A., BUCHGRABER, M., ULBERTH, F. 2000. Untersuchung von Ölen mittels ^{13}C -NMR Spektroskopie. 9. Österr. Chemietage, Innsbruck, Austria.

PUCHBERGER, M., REISCHL, W. 2000. Preliminary investigations on solid state conformations of 1-hydroxy- vitamin D by NMR. 11th Workshop on Vitamin D, Univ. California, Riverside, USA.

ROSENAU, T. 2000. (Warburg-Preisträger des Verbands der Chem. Industrie)

Novel Tocopherol Derivatives. Chemistry in the new millenium. Annual Meeting of the VCI.. Frankfurt / Main, Germany.

1999

SCHARNHORST, K., SCHUHMACHER, R., STEINER, I., KOSMA, P., KRŠKA, R. 1999. Markierte Mykotoxine: Synthese und Nachweis von Zearalenon-4-glucosid. ANACON, Niederlande

REITER, A., ZAMYATINA, A., SCHINNDL, H., HOFINGER, A. and KOSMA, P. 1999. Synthesis of inner core oligosaccharides related to *Pseudomonas aeruginosa* lipopolysaccharide containing 7-O-carbamoyl-L-glycero-D-manno-heptopyranosyl residues. XIIth Kdo Meeting, Borstel, Germany.

KOSMA, P., REITER, A., ZAMYATINA, A., WIMMER, N., HOFINGER, A. SEKLJIC, H., ZÄHRINGER U., and BRADE, H. 1999. Synthesis of bacterial inner core antigens. Keynote Lecture, EUROCARB X, Galway, Ireland, KN14.

ZAMYATINA, A., KOSMA, P. and BRADE, H. 1999. Synthesis of ADP D-glycero-D-manno- and L-glycero-D-manno-heptose. EUROCARB X, Galway, Ireland, Abstr. PA 117.

REITER, A., and KOSMA, P. 1999. Synthesis of inner core oligosaccharides related to *Pseudomonas aeruginosa* lipopolysaccharide containing 7-O-carbamoyl-L-glycero-D-manno-heptopyranosyl residues. EUROCARB X, Galway, Ireland, Abstr. PA 115.

WIMMER, N., KOSMA, P., GLÜCK, A. and BRADE, H. 1999. Synthesis of disaccharides related to the inner core of *Acinetobacter haemolyticus* and *Burkholderia cepacia* lipopolysaccharide containing 7-O-carbamoyl-D-glycero-D-talo-oct-2-ulosonic acid (Ko). EUROCARB X, Galway, Ireland, Abstr. PA 114.

AMER, H. A-Z., KOSMA, P. and MAIZELS, R. M. 1999. Chemical synthesis of trisaccharide epitopes of surface coat glycoproteins from infective larva of *Toxocara canis*. EUROCARB X, Galway, Ireland, Abstr. PA 116.

SÁNCHEZ CARBALLO, P. M., RIETSCHER, E. T., KOSMA, P. and ZÄHRINGER, U. 1999. Isolation and structural characterisation of a tetrasaccharide triphosphate from the inner core region of *Pseudomonas aeruginosa* mutant H4. EUROCARB X, Galway, Ireland, Abstr. OB 08.

SPLECHTINA, B., REITER, A., PETZELBAUER, I., PUCHBERGER, M., KULBE, K. D., KOSMA, P. and NIDETZKY, B. 1999. Identification of galacto-oligosaccharides produced during the hydrolysis of lactose using the thermostable β -galactosidase from *Pyrococcus furiosus*. EUROCARB X, Galway, Ireland, Abstr. PD 042.

WUGEDITSCH, T., ZACHARA, N. E., PUCHBERGER, M., KOSMA, P., GOOLEY A. A. and MESSNER, P. 1999. A novel linkage type and structural heterogeneity in the core oligosaccharide of the S-layer glycoprotein from *Aneurinibacillus thermoaerophilus* DSM 10155. Proc. XVth Int. Symposium on Glycoconjugates, Tokyo.

WIMMER, N., KOSMA, P., GLÜCK, A. and BRADE, H. 1999. Synthesis of disaccharides related to the inner core of *Acinetobacter haemolyticus* and *Burkholderia cepacia* lipopolysaccharide containing D-glycero-D-talo-oct-2-ulonic acid (Ko). 3rd Int. Meeting of the Portuguese Carbohydr. Chem. Group, Aveiro, Portugal, Abstr. P29

1998

REITER, A., ZAMYATINA, A., SCHINDL, H., HOFINGER, A. and KOSMA, P. 1998. Synthesis of RNA-group I specific *Pseudomonas aeruginosa* lipopolysaccharide core antigens containing 7-O-carbamoyl-L-glycero-D-manno-heptopyranosyl residues. 19th Int. Carbohydrate Symposium, San Diego, USA, and XIth Kdo symposium, Borstel Germany.

KOSMA, P., 1998. Synthesis of Inner core antigens related to *Chlamydia*, *Pseudomonas* and *Acinetobacter* LPS. Fifth Conference Int. Endotoxin Society, Santa Fe, USA.

BRADE, H., BRADE, L., BRABETZ, W., LÖBAU, S., KOSMA, P., PETERS, T., and HOLST, O. 1998. Structure, biosynthesis and immunoreactivity of chlamydial lipopolysaccharides: examples of biomedically relevant protein-carbohydrate interactions. Int. GlycoBioTechnology Symposium, Braunschweig, Germany.

BRADE, H., BRABETZ, W., BRADE, L., HOLST, O., KOSMA, P., LÖBAU, S., MacKENZIE, C. R., MÜLLER-LÖNNIES, S., NARANG, S. A., PETERS, T., and RUND, S. 1998. Structure, biosynthesis and immunoreactivity of chlamydial lipopolysaccharides: examples of biomedically relevant protein-carbohydrate interactions. Fifth Conference Int. Endotoxin Society, Santa Fe, USA. Inv. Lecture.

KOSMA, P. 1998. Synthesis of Inner core oligosaccharide antigens from *Pseudomonas* and *Acinetobacter* LPS. Invited lecture, Glycostructures in Biological systems, Hamburg, Germany.

BRADE, H., MÜLLER-LÖNNIES, S., KOSMA, P. and PETERS, T. 1998. Immunoreactivity of chlamydial lipopolysaccharide as an example of a biomedically relevant protein-carbohydrate interactions. Glycostructures in Biological systems, Hamburg, Germany. Poster P2

MAAHEIMO, H., HASELHORST, T., PLATH, C., SOKOLOWSKI, T., BRADE, L., BRADE, H., KOSMA, P., and PETERS, T. 1998. Recognition of synthetic chlamydia antigens by monoclonal antibodies studied by NMR. Glycostructures in Biological systems, Hamburg, Germany. Poster P13

MÜLLER-LÖNNIES, S., MacKENZIE, C. R., PATENAUDE, S. I., EVANS, S. V., KOSMA, P., BRADE, H., BRADE, L. and NARANG, S. 1998. Antibodies to chlamydial lipopolysaccharide possess high affinity and do not fit the anti-carbohydrate antibody stereotyp. Glycostructures in Biological systems, Hamburg, Germany. Poster P 19

Research Group - Plant Carbohydrates

2000

HUBER A., PELZL B., MARX, D., and PRAZNIK W., 2000. Molekulare Kenngrößen wasserlöslicher natürlicher Polymere und ihr Einfluss auf makroskopische Materialeigenschaften. 4.Österr. Polymertage, Austria. lecture

MARX D., PRAZNIK, W., and HUBER A., 2000. Starch-Glucan Structure - Fragmentation Techniques. 4.Österr. Polymertage, Innsbruck, Austria. poster

MARX D., PRAZNIK, W., and HUBER A., 2000. Starch-Glucan Structure – Analysis. 4.Österr. Polymertage, Innsbruck, Austria. poster

PRAZNIK, W., and HUBER A., 2000. Molecular structure and physico-chemical properties of pseudocereal starches. 9. Int. Starch Convention, Cracow, Poland, lecture

ZIOBRO, R., NOWOTNA, A., GAMBUS, H., GOLACHOWSK, I. A., SUROWKA, K., and PRAZNIK, W. 2000. Susceptibility of starch from various biological sources to degradation due to extrusion process. 9. Int. Starch Convention, Cracow, Poland. lecture

MARX, D., PRAZNIK, W., and HUBER, A. 2000. Starch-Glucan Structure -Fragmentation Techniques & Analysis. 9. Int. Starch Convention, Cracow, Poland, poster

PRAZNIK, W. and CIESLIK, E. 2000. The composition of jerusalem artichoke (*Helianthus tuberosus* L.) powders and their application in bakery products. Fourth International Fructan Symposium, Arolla, Switzerland. lecture

ALBRECHT, G., KLOTKE, J. and PRAZNIK, W. 2000. Carbohydrate partitioning between storage pools of roots during oxygen deficiency. Fourth International Fructan Symposium, Arolla, Switzerland. lecture

CIESLIK E., FILIPIAK-FLORKIEWICZ, A. and PRAZNIK, W. 2000. Quality of bread with jerusalem artichoke (*Helianthus tuberosus* L.) powders as suppliment. Fourth International Fructan Symposium, Arolla, Switzerland. poster

KLOTKE, J., GERD ALBRECHT, G. and PRAZNIK, W. 2000. Enzymatical measurements of small amounts of fructans in sugar containing samples of plant. Fourth International Fructan Symposium, Arolla, Switzerland. poster

CIESLIK, E., FILIPIAK-FLORKIEWICZ, A., FLORKIEWICZ, A. and PRAZNIK, W. 2000. Die Zusammensetzung von ausgewählten Mineralstoffen in neuen Topinambursorten (polnisch), Symposium Zywnosc-Lek-Zdrowie (Nahrung-Arzneimittel- Gesundheit), Lodz, Poland, poster

CIESLIK E., FILIPIAK-FLORKIEWICZ, A. and PRAZNIK, W. 2000. Der Einfluß der Düngung auf den Nitrat- und Nitritgehalt von Kartoffeln. (polnisch), Symposium Zywnosc-Lek-Zdrowie (Nahrung-Arzneimittel- Gesundheit), Lodz, Poland. poster

PRAZNIK, W. and HUBER, A. 2000. Auswirkung verschiedener Verzweigungsmuster auf Stärkeeigenschaften. Sitzung des Stärke-Fachausschusses, Vienna, Austria. invited lecture

PRAZNIK, W., and CIESLIK, E. 2000. The potential of dietary fibres in tubers of jerusalem artichoke with respect to their application in functional food. 5th Karlsruhe Nutrition Congress, Karlsruhe, Germany. poster

PRAZNIK, W., KOCSISOVA, L., and LIEBHARD, P. 2000. The composition of soluble carbohydrates in tubers of different cultivars of jerusalem artichoke (*Helianthus tuberosis* L.). 5th Karlsruhe Nutrition Congress, Karlsruhe, Germany. poster

CIESLIK, E., AND PRAZNIK, W. 2000. Studies on the nutritive value of bread with an addition of jerusalem artichoke, 5th Karlsruhe Nutrition Congress, Karlsruhe, Germany. poster

1999

PRAZNIK W., 1999. New aspects for the application of plant carbohydrate in food. 30. Conference on Food technology, Krakow, Poland. invited lecture

HUBER A., and PRAZNIK W., 1999. Molecular dimensions and interactive properties of polysaccharides. 13th Bratislava International Conference on Polymers: Separation and Characterization of Macromolecules, Bratislava, SK. invited lecture

HUBER, A., PELZL, B., PRAZNIK, W., KOGLER, A., MUNDIGLER, N., and WOLLERDORFER, M. 1999. Ausgewählte Getreidestärken: molekulare Grundlage technologischer Eigenschaften. 50. Stärketagung, Detmold, France. lecture

CIESLIK, E. and PRAZNIK, W. 1999. New aspects for the application of plant carbohydrate in food. 30. Conference on Food technology, Krakow, Poland. invited lecture

CIESLIK E., and PRAZNIK W., 1999. Studies on the nutritive value of bread with Jerusalem artichoke as additive. Euro Food Chem X. Internat. Conference, Budapest, Hungary., poster

PELZL, B., PRAZNIK, W., MUNDIGLER, N., KOGLER, A., WOLLERDORFER, M., and HUBER, A., 1999. Comparing molecular and technological properties of cereal starches: wheat and waxy maize. Jahrestagung der österreichischen Gesellschaft für Biotechnologie, Seggau, Austria. poster

ZIOBRO, R., PELZL, B., PRAZNIK, W., and HUBER, A. 1999. Consequences of extrusion on molecular characteristics of cereal starches Jahrestagung der österreichischen Gesellschaft für Biotechnologie, Seggau, Austria. poster

YASAR, S., LIEBHARD, P., and PRAZNIK W. 1999. Industrielle Polysaccharide von *Miscanthus Sinensis*. Jahrestagung der österreichischen Gesellschaft für Biotechnologie, Seggau, Austria. poster

KOCSISOVA, L., SCHMIDT, G., LIEBHARD, P., and PRAZNIK, W. 1999. Das Kohlenhydratmuster von ausgewählten Topinambursorten (*Helianthus tuberosus L.*) im Verlauf einer Vegetationsperiode. Jahrestagung der österreichischen Gesellschaft für Biotechnologie, Seggau, Austria. poster

NEUBAUER K., PRAZNIK W., 1999. Die Bestimmung des Propoxylgehaltes in mit Epichlorhydrin veresterten Stärken. Jahrestagung der österreichischen Gesellschaft für Biotechnologie, Seggau, Austria. poster

1998

PRAZNIK, W. and CIESLIK, E. 1998. The composition of nutritive components in tubers of Jerusalem artichoke. Profibre Symposium, Lisbon, Portugal.

PRAZNIK, W., and HUBER, A. 1998. Modification of starch oligomers and polymers with enzymes. VIII International Starch Convention, VIII ISC, Cracow, Poland. lecture

PRAZNIK, W., CIESLIK, E., and FILIPIAK, A. 1998. The influence of harvest time on the content of nutritional components in tubers of J. artichoke (*Helianthus tuberosus L.*). In Proceedings of 7th Seminar of Inulin. Leuven, Belgien. eds. A. Fuchs, CRF, 154-157.

PRAZNIK, W. and HUBER, A. 1998. Modification of branching pattern of potato maltodextrin with Q-Enzyme In Proceedings of VII International Starch convention. Cracow, Poland. eds. Tomasik, 202-216.

External Activities

Research Activities Abroad

Christa Jakopitsch

3 months at the Centre d'Etudes de Saclay, Section de Bioenergetique, Gif-sur-Yvette, France, 2000

Leo Stich

1 month at the Laboratory of Forest Products Chemistry, Åbo Akademi University Turku, Finland, 2000

Gunda Köllensperger

1 week, GKSS Gesthacht, Germany, 2000

Paul Georg Furtmüller

5 months at the Department of Chemistry, University of Alberta, Edmonton, Canada, 1999

Dagmar Dietmann

1 month at the Department of Biology, Univ. Rome „Tor Vergata“, 1999

Stephan Hann

2 weeks, Old Dominion University, Norfolk, Virginia, USA, 1999

Martina Paumann

3 months at the Free Radical Research Group at the Christchurch School of Medicine, Christchurch, New Zealand, 1999

Michael Puchberger

3 months, Univ. Dundee, NMR-Dept., 1999

Günther Regelsberger

1 month at Institute of Chemistry, University of Florence, Italy, 1999

Ursula Burner

5 months at the Free Radical Research Group at the Christchurch School of Medicine, Christchurch, New Zealand, 1998

Thomas Prohaska

2 years at the European Commission Joint Research Center, IRMM Geel, Belgium, 1999-2000

Paul Kosma

1 week Univ. Edinburgh, Structural Biology Group, 1998

External Teaching Activities

F. Altmann: Lecturer at FEBS Advanced Course on "Glycoconjugates", 24-30. September 1999, Croatia

F. Altmann: Guest lecturer at Osaka University, March 2000

Habilitation Theses

Mag. Dr. Christian Obinger for Biochemistry

Lecture: Struktur-Funktionsbeziehung am Beispiel von sauerstoff- und peroxidmetabolisierenden Hämproteinen
November 5, 1999, University of Agricultural Sciences
Associated Professor for Biochemistry since March 2000

Dipl.-Ing. Dr. Erika Staudacher for Biochemistry

Lecture: Fokosylierung von N-Glykanen von Pflanzen bis zum Menschen: eine (über)lebenswichtige
Modifikation
March 31, 2000 University of Agricultural Sciences
Associated Professor for Biochemistry since October 2000

Awards

Gunda Köllensperger and Stephan Hann
2001 Preis der Wirtschaftskammer; Austria

Juliane Paschinger
2000 Honorary Medal of the University of Agricultural Sciences Vienna

Christian Obinger
2000 NOVARTIS Award for Biochemistry; Austria

Thomas Rosenau
2000 Warburg Award of the GDCh; Germany

Thomas Rosenau

2000 International Lyocell-Award; Germany

Thomas Rosenau

1998 Hermann Kolbe Award of the GDCh; Germany

Antje Potthast

1999 Hermann Kolbe Award of the GDCh; Germany

Iain B. H. Wilson

1999 Neose Glycoscience Research Award; USA

T. Prohaska, C. Latkoczy and G. Stingeder

1999 "Plasma Winter Conference 99", Pau, France - prize for the best poster of the session

"The utility of novel applications for a high resolution ICP sectorfield MS (HR-ICP-SFMS) for precise determination of isotope ratios in tracer studies"

Latkoczy, T. Prohaska, G. Stingeder and M. Teschler-Nicola

1998 "6th International Conference on Plasma Source Mass Spectrometry", Durham, UK, - prize for the best contribution to the conference

"Strontium isotope ratio measurements of prehistoric human bone samples by means of ICP-SFMS" (lecture)

Visiting Professor

Univ.Prof. Dr. Marijan Šeruga (June 2000)

Department of Chemistry, Faculty of Food Technology, University of Osijek, Croatia

Dr. Leon Backinowsky (July 1998)

N.D. Zelinsky Institute of Organic Chemistry, Moscow

Invited Speakers

2000

Prof. Dr. Christian Jäger

Institut für Optik und Quantenelektronik, Friedrich Schiller Universität Jena, Germany

NMR-Charakterisierung an Cellulosen: Stand und Perspektiven.

Prof. Bozena Kosikova

Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia

Novel alternatives of environmentally friendly utilization of lignin biopolymers derived from wood pulping.

Dr. Guido Bracke

Centre de Geochimie de la Surface, Strasbourg, France

Der Nachweis des natürlichen Kernspaltungsprozesses in OKLO (GABUN) und dessen Verwendung als natürliches Analog einer Endlagerungstätte.

Prof. Karl Buchtela

Atominstytut der Österreichischen Universitäten Vienna, Austria

Grundlagen der Radioaktivitätsmessung.

Prof. Erwin Rosenberg

Institut für Analytische Chemie, TU-Wien, Austria

Speziesanalytik in der Umwelt.

1999

Ulf Marquardt

Max-Planck-Institut für Biochemie, Martinsried bei München, Germany

Strategies towards Crystallization Example: Catalase-peroxidase from *Anacystis nidulans*.

Dr. Richard Buchner

Institut für Physikalische und Theoretische Chemie, Universität Regensburg, Germany

Was erfahren wir über Ionensolvatation und –assoziaton in DMF und DMA mittels Dielektrischer Relaxationsspektroskopie?

Dr. Antony Kettle

Free Radical Research Group, Department of Pathology, Christchurch School of Medicine, New Zealand

Chlorine Bleach: Friend and Foe in Inflammation.

Dr. Eckart Wellmann

Institut für Biologie II, Universität Freiburg im Breisgau, Germany

UVB-induzierter Phenylpropan-Stoffwechsel: Bedeutung für Entwicklung und Ertragsbildung von Kulturpflanzen.

Dr. Heinz Langhals

Institut für Organische und Makromolekulare Chemie, der Ludwig-Maximilian Universität München, Germany

Neuere Anwendungen von Fluoreszenzfarbstoffen.

Dr. Andreas Zemann

Institut für Analytische Chemie und Radiochemie, der Universität Innsbruck, Austria

Strategien zur schnellen und sensitiven Bestimmung von anorganischen und organischen Ionen mit Kapillarelektrophorese.

Dr. Chen-Loung Chen

Dept. Wood&Paper Sciences, NCSU Raleigh, USA

Kinetic studies on Binuclear Mn(IV) complex-catalyzed delignification of Kraft-AQ Pine Pulp with hydrogen peroxide.

Dr. Mikhail Balakshin

Dept. Wood&Paper Sciences, NCSU Raleigh, USA

The mechanism of lignin degradation with the laccase-mediator system.

Dr. Lori A. Eriksson

Westvaco Corp., Vovington, VA, USA

Treatment of wood blocks with cellulose degrading enzymes.

Dr. Joseph S. Lam

Department of Microbiology, University of Guelph,

Lipopolysaccharides of *Pseudomonas aeruginosa* – metabolic pathways, antimicrobial targets and duplication of essential genes.

Dr. Hans G. Loew

Research Associate, Harvard Medical School, USA

Ultraschallinduzierter Sauerstofftransport in Mehrphasensystemen und dessen Wirkung auf photochemische und photodynamische Elementarprozesse.

Scientific Events

Vienna 2001 ICP-MS Conference Series:

17th ICP-MS D/A/CH user meeting

September 10-12, 2001, Vienna, Austria

Organizer: Working group of Analytical Chemistry

<http://www.boku.ac.at/chemie/conferences/conferences.htm>

2nd Intl. Conference on high resolution and magnetic sector field ICP-MS

September 12-15, 2001, Vienna, Austria

Organizer: Working group of Analytical Chemistry

<http://www.boku.ac.at/chemie/conferences/conferences.htm>

International conference on the peroxidase superfamily II of animal and human enzymes: Biochemical basis and clinical application

September 3-8, 2000, Vienna, Austria

Organizer: Biochemistry B / Heme Protein Research Group

<http://www.boku.ac.at/pod2000/>

Immunobiology of allergens and allergen-specific immune responses

September 29, 2000, Vienna, Austria

Organisation: Altmann, Wilson

European research conference on the molecular bioenergetics of cyanobacteria (energy conversion and electron transport)

June 5-10, 1999, Gmunden Austria

Coorganizer: Biochemistry B / Heme Protein Research Group

Advances in wood chemistry

May 30, 1999, BOKU, Vienna, Austria

Organizer: Christian Doppler-Laboratory of Pulp Reactivity

4. Österr. Kohlenhydratworkshop

February 11, 1999

Organizer: P. Kosma

ÖGBT-annual meetings, 1998 and 1999

Organizer: W. Praznik

Other External Activities of the Members of the Institute

Univ.Prof. Dr. G. Stinger is member of the board of the Austrian Society for Analytical Chemistry.

Univ.Prof. Dr. P. Kosma is National representative of Austria in the European (ECO) and International Carbohydrate Organization (ICO) and member of the Editorial Board of Journal of Endotoxin Research

Dr. Iain Wilson is the Mini-Review Editor (Europe) for the Glycoconjugate Journal

Prof. W. Praznik is member of scientific committee of International Starch Convention, Cracow / Poland, of the Advisory Board of Starch / Stärke, International Journal for the Investigation, Processing and Use of Carbohydrates and their Derivatives and of the Starch Experts Committee, Germany

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Impressum

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