Claus-Peter Witte
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EDUCATIONAL BACKGROUND

1991-1997	University studies in Biotechnology at the Technical University of Braunschweig. *Undergraduate project* (Jul.- Dec. 1995) at the Department for Biochemistry and Molecular Biology of the University of Córdoba, Spain, in the group of Prof. Francisco Castillo. Subject: Biodegradation of 2-amino-4-nitrophenol by *Rhodobacter capsulatus*. *Diploma project* (Apr.- Dec. 1996) at the Department for Biochemistry and Molecular Biology of the University of Córdoba, Spain, in the group of Prof. Emilio Fernández. Subject: Purification and characterisation of the Molybdenum Cofactor Carrier Protein (MoCoCP) from *Chalmydomonas reinhardtii*. *Diploma* (equivalent to MSc) with maximum qualification "mit Auszeichung" in March 1997. This qualification is reached by less than 1% of students.
1997	6-month contract from the University of Córdoba in continuation of the project started during the diploma thesis. (Mar. - Sep.).
Since September 1997	PhD thesis in the Department of Plant Biochemistry at the Scottish Crop Research Institute, Dundee, UK, under the direction of Prof. Howard Davies and Dr. Mark Taylor. Title: "Modifying nitrogen use efficiency: Molecular manipulation of urea metabolism in leaves"

AWARDS AND FELLOWSHIPS

1997	Doctoral scholarship of the German Academic Exchange Service
1998	Marie Curie PhD Research Training Grant of the European Commission

RESEARCH EXPERIENCE

My research has covered a wide array of techniques. I have experience with protein purification (Molybdenum Cofactor Carrier Protein, Urease Accessory Protein G), biochemical characterisation of proteins, assay development and preparation of proteins and peptides for sequencing.

During my PhD, I became familiar with molecular biology techniques and methods of database screening and sequence analysis. I cloned the urease genes from potato and soybean and several urease accessory proteins (ureD, ureF, ureG), not previously described in plants. A range of approaches was used to test the functionality of putative urease accessory proteins: bacterial complementation, virus-induced post transcriptional gene silencing, and screening for T-DNA insertion mutants in *Arabidopsis*. The expression of urease and urease accessory proteins at mRNA and protein levels was studied using semi-quantitative RT-PCR, Western analysis and enzymatic assays. This led to the investigation of further interesting questions like the influence of retrotransposon activity and differential splicing on the expression of urease.

Using the cloned genes, transgenic potato plants with increased and reduced urease activity were generated to investigate questions of urea metabolism applying chemical and enzymatic assays and using ^{15}N isotope analysis. The focus lay on elucidating the cause for nitrogen-losses after foliar urea fertilisation.

OVERVIEW OVER TECHNICAL SKILLS

- Gene cloning (library screening, PCR-based approches)
- Expression analysis: Northern blotting, semi-quantitative RT-PCR

- Computer analysis of sequences and database searching (GCG, EMBOSS, ClustalW, HMMER, PatScan, phylogenetic analysis).
- Basic molecular biology techniques: Southern analysis, Exonuclease III digests, PCR, cloning, sequencing, etc.
- Gene functionality testing by virus-induced post transcriptional gene silencing
- Heterologous gene expression in *E. coli*
- Complementation studies in *E. coli* by co-expression of plant and bacterial genes from plasmids.
- Screening for T-DNA insertion mutants in *Arabidopsis*
- Site directed mutagenesis using PCR techniques
- Plant transformation (potato) using *A. tumefaciens* and tissue culture
- Gene mapping using microsatellites
- Protein purification (precipitations, chromatography and preparative electrophoretic techniques)
- Generation of polyclonal antibodies and Western blotting
- Preparation of proteins for N-terminal and internal peptide sequencing
- Development and application of enzymatic assays
- Use of stable isotopes (^{15}N) for metabolic / molecular physiology studies
- HPLC analysis

MANAGEMENT RESPONSIBILITIES

During my PhD I was responsible for the research planning and direction of a technical assistant.

PUBLICATIONS

Claus-Peter Witte, Sarah A. Tiller, Mark A. Taylor, Howard V. Davies (2001)
Addition of nickel to Murashige & Skoog medium in plant tissue culture activates urease and may reduce metabolic stress. *Plant Cell, Tissue and Organ Culture*, in press.

Claus-Peter Witte, Nieves Medina-Escobar (2001). In-gel detection of urease with nitroblue tetrazolium and quantification of the enzyme from different crop plants using the indophenol reaction. *Analytical Biochemistry* 290 (1), 102-107.

Claus-Peter Witte, Edwige Isidore, Sarah A. Tiller, Howard V. Davies, Mark A. Taylor (2001). Functional characterisation of urease accessory protein G (ureG) from potato. *Plant Molecular Biology* 45, 169-179.

Claus-Peter Witte, M. Isabel Igeño, Ralf Mendel, Günter Schwarz, Emilio Fernández (1998). The *Chalmydomonas reinhardtii* MoCo Carrier Protein is multimeric and stablilizes molybdopterin cofactor in a molybdate charged form. *FEBS Letters* 431, 205-209.

Claus-Peter Witte, Rafael Blasco, Francisco Castillo (1998). Micobial photodegradation of aminoarenes. Metabolism of 2-amino-4-nitrophenol by *Rhodobacter capsulatus*. *Applied Biochemistry and Biotechnology* 69, 192-202.

PUBLICATIONS SUBMITTED OR IN PREPARATION

Claus-Peter Witte, Sarah A. Tiller, Mark A. Taylor, Howard V. Davies
Leaf urea metabolism in potato: Urease activity profile, and patterns of recovery and distribution of ^{15}N after foliar urea application in wild-type and urease-antisense transgenics. *Plant Physiology*, submitted

Claus-Peter Witte, Hien Le, Thomas Bureau, Amar Kumar
Terminal-repeat retrotransposons in miniature (TRIM) are involved in restructuring plant genomes. *Proc. Natl. Acad. Sci. USA*, submitted.

Claus-Peter Witte, Sarah A. Tiller, Edwige Isidore, Mark A. Taylor, Howard V. Davies
Analysis of two alleles of the urease gene from potato (*Solanum tuberosum*): polymorphisms, intron positions and extensive alternative splicing of the corresponding mRNA in leaf and root. *Plant Molecular Biology*, submitted.

Claus-Peter Witte, Sarah A. Tiller, Howard V. Davies, Amar Kumar

Retrotransposon activity in urease genes of solanaceous species, *Molecular and General Genetics*, in preparation

Claus-Peter Witte, Nieves Medina-Escobar

Urease in barley (*Hordeum vulgare* L.) is not inducible by urea and is encoded by a single copy gene, *Planta*, in preparation

CONTRIBUTION TO CONFERENCES

1999 Oral presentation at the *Scottish Plant Molecular Biology Forum*, Heriot-Watt University, Edinburgh, UK.

1997 Oral presentation at *Avances en el Metabolismo del Nitrógeno: de la Fisiología a la Biología Molecular. IV Reunión Nacional*, Marbella, Spain.

LANGUAGES

German (native speaker)
English (fluent in speech and writing)
Spanish (fluent in speech and writing)
French (some knowledge)

REFEREES

PhD supervisor

Prof Howard V. Davies

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German supervisor of the diploma thesis

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Spanish supervisor of the diploma thesis

Prof. Emilio Fernández

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PhD supervisor

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