Suggestion for a central research area at The Danish University of Pharmaceutical Sciences, March 2006

NATURAL PRODUCTS RESEARCH

Profile

The research area is characterized by innovative research aimed towards discovery and development of new therapeutic agents from plants and other natural sources, and development of new and improved research technologies and methodologies within the field. The group combines modern technologies and pioneering visions with strong traditions for research in natural products, characteristic for the pharmaceutical universe, with the overall aim to improve human health and disease control.

Visions

The missions of the central research area are to:

- Provide cutting edge technology for drug discovery based on natural resources
- Provide new lead compound for medicinal chemistry research
- Provide knowledge and services to the Society in relation to the use of natural products as drugs, natural remedies, and food supplements

Traditionally, natural products have served as a major source of drugs. In the recent decade, the rate of launching of new drugs has stagnated and in 2005 decreased to an all-time low. At the same time, there is a growing understanding that natural products are a source of chemical diversity and biological functionality, which are inaccessible by other means. New technologies, such as high-throughput dereplication based on hyphenated techniques (e.g., HPLC-SPE-NMR), diversity-oriented synthesis of natural products libraries, natural product scaffolds, multivariate analysis of complex spectroscopic and chromatographic data, genetic engineering, and combinatorial biosynthesis, provide basis for a renewed interest in natural products in big pharmaceutical companies. At the same time, numerous start-up companies bring natural product-based, experimental drugs into clinical trials.

Our visions are to advance our position as a major European research group in the natural product field, promote natural products-based drug discovery programs in the
pharmaceutical industry through research in underlying technologies, and to promote rational and knowledge-based use of natural remedies by the consumers.

**Status of the research area**

The research in the Natural Products Research group has a high international standard. Visibility and viability of the research area are illustrated by lists of publications, national and international collaborations, external funding (which include major investments into advanced instruments), and presentations at international symposia as invited speakers. Natural Products Research is an important part of medicinal chemistry research at the Department; the majority of compound classes that are under investigation at the Department originate from natural sources (analogues of *Amanita muscaria* constituents, thapsigargin, wasp toxins analogues, ginkgolides, various alkaloids, etc.). Medicinal chemistry research on thapsigargin has reached an advanced stage, with a prospect of a derivative of thapsigargin entering clinical trials.

An important core-expertise of the group is NMR spectroscopy. The group maintains state-of-the art NMR equipment, and has an internationally leading position in hyphenated NMR methods, in particular HPLC-SPE-NMR. The group provides NMR services to the Danish pharmaceutical industry. The group has contributed heavily to the establishment of NMR-based metabonomics as a new research area at DFU.

The group develops advanced methods of solid-phase parallel synthesis for SAR studies and modulation of pharmacological activity. The methods are applied mainly in the area of wasp toxin analogues and for diversity-oriented synthesis. Both in this area and in the thapsigargin area, molecules exhibiting nanomolar and sub-nanomolar potencies on their respective macromolecular targets have been obtained.

**Major research projects**

- Development of thapsigargin-analogues for tissue-targetted chemotherapy of prostatic cancer and studies of mechanism of action of thapsigargin
- Hyphenated NMR methods for rapid dereplication of natural products
- Wasp toxin analogues with activity on ionotropic receptors
- Discovery of natural products with activity at CNS receptors and transporters and antimalarial natural products
- Analysis and quality control of natural remedies; plant metabolomics

**Contributing researchers**

Professor Jerzy W. Jaroszewski, Docent Søren B. Christensen, Associate Professors Anne Adersen, Henrik Franzyk, Anna K. Jäger, Per Mølgaard, and Dan Stærk, Assistant
Professor Hanne L. Ziegler, 5 postdocs, 4 Ph.D. students, 5 guest researchers (4 from abroad), an average of 12 M.Sc. students a year, and 6 technicians. Promising young scientists are key persons of the area and play pivotal roles for the integration of new innovative basic research disciplines with existing expertise. Publications in peer-reviewed international journals 2001–2006 are enclosed in Appendix A and CV's of 8 tenured staff members are enclosed in Appendix B.

**Number of publications (peer-reviewed) and citations per year from 2001-**

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<th>Year</th>
<th>Publ.</th>
<th>Cit.</th>
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<tr>
<td>2005</td>
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<td>19</td>
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**External funding per year from 2003- (actual payments to DFU)**

- 2003: 2.6 mio DKr
- 2004: 2.5 mio DKr
- 2005: 2.4 mio DKr

**Importance to the society**

The importance of the research area to the society is manifested at many levels, first and foremost through generation of knowledge within this important field, but also through education of pharmacists and researchers, who receive interdisciplinary training. Candidates graduating from the group are in strong demand in the Danish pharmaceutical industry. Natural products and natural products-derived drugs are of great importance to the society. The group contributes to the European Pharmacopeia, and supports work of Danish Drug Administration related to natural products.

The area of natural products research has contributed with a major part of the patents issued at DFU. One of a very few start-up companies, established or co-established by researchers from DFU, originates from research in this group (Lica Pharmaceuticals).

The group has collaboration- or service-agreements with 6 industrial partners.

**Collaborations (defined by co-publications)**

**International**

- Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins Medical School, Baltimore, MA (S. R. Denmeade, J. T. Isaacs)
• Imperial College London, London, UK (O. Cloarec, H. Tang)
• Faculty of Pharmaceutical Sciences, Fukuoka University, Fukuoka, Japan (F. Abe)
• Bruker Daltonik GmbH, Bremen, Germany (M. Witt)
• Department of Biology, Åbo Akademi University, Åbo/Turku, Finland (H. Hägerstrand)
• Department of Chemistry, University of Cambridge, Cambridge, UK (S. V. Ley)
• Department of Chemistry, University of Perugia, Perugia, Italy (G. Cruciani)
• Division of Molecular Toxicology, University of Nottingham, UK (I. A. Mellor, P. N. R. Usherwood)
• Faculty of Pharmacy, University of Iceland, Reykjavik, Iceland (E. S. Olafsdottir)
• Institut für Organische Chemie, Würzburg Universität, Würzburg, Germany (G. Bringmann)
• Institut für Pharmazie, Freie Universität Berlin, Berlin, Germany (O. Kayser)
• University of Ghana, Legon, Ghana; Centre of Scientific Research into Plant Medicine, Mampong-Akwapim, Ghana (D. K. Abbiw, P. Ekpe, W. A. Asomaning, A. A. Sittie)
• Department of Medicinal Chemistry, Tehran University of Medical Sciences, Tehran, Iran; Department of Pharmacognosy, Isfahan University of Medical Sciences, Isfahan, Iran; Medicinal Plants Unit, Isfahan Research Centre of Natural Resources and Animal Science, Isfahan, Iran (I. S. Ibrahim, G. Ashgari, M. Asfa, K. Bagherzadeh, B. Bahreininejad)
• Research Centre for Plant Growth and Development, University of KwaZulu-Natal, South Africa (J. van Staden)
• Farmesøytisk Institutt, Universitetet i Oslo, Norge (H. Barsett)

National

• Department of Molecular Biology, University of Aarhus (P. Nissen)
• Department of Biophysics and Physiology, University of Aarhus (J. V. Møller)
• Botanical Institute, University of Copenhagen, Copenhagen (L. B. Jørgensen)
• Centre for Medical Parasitology, Copenhagen University Hospital, Copenhagen (M. Chen, L. Hvid, T. Staalso, T. G. Theander)
• Department of Clinical Microbiology, Hvidovre Hospital, Copenhagen (A. Friis-Møller)
• Department of Chemistry, Carlsberg Laboratory, Valby (J. Ø. Duus)
• Department of Chemistry, Technical University of Denmark, Lyngby (S. R. Jensen)
• Department of Chemistry, University of Southern Denmark, Odense (B. A. Budnik)
• Department of Natural Sciences, Royal Veterinary and Agricultural University, Frederiksberg (C. E. Olsen, L. Hemmingsen)
• Department of Combinatorial Chemistry, Lundbeck A/S, Valby (K. Andersen, T. Ruhland)
• Statens Serum Institute, Copenhagen (J. Blom, K. A. Krogfelt)

Intramural

• Department of of Pharmaceutics and Analytical Chemistry (C. Cornett, S. H.
Hansen)
• Department Medicinal Chemistry, Biostructural Research (K. Frydenvang, F. S. Jørgensen, T. Liljefors)
• Department of Medicinal Chemistry, Neuromedicinal Chemistry (K. Strømgaard, P. Wellendorph, M. Begtrup, P. Krogsgaard-Larsen, T. Balle)
• Department of Pharmacology (H. S. Hansen, K. B. Andersen, B. Moesgaard)
• Department of Pharmacy (L. Hovgaard, M. Kreilgaard)
Appendix A

Peer-reviewed publications since 2001.

2006


Kvist, L. P.; Christensen, S. B.; Rasmussen, H. B.; Mejia, K.; Gonzalez, A. Identification and evaluation of Peruvian plants used to treat malaria and leishmaniasis. *J. Ethnopharmacol.* **2006**, *00*, 0000-0000.


2005


Søhoel, H.; Liljefors, T.; Ley, S. V.; Oliver, S. F.; Antonello, A.; Smith, M.D.; Olsen, C.


2004


Ley, S. V.; Antonello, A.; Balskus, E. P.; Booth, D. T.; Christensen, S. B.; Cleator, E.;
Gold, H.; Hogenauer, K.; Hunger, U.; Myers, R. M.; Oliver, S. F.; Simic, O.; Smith, M.
USA 2004, 101, 12073-12078.


Olsen, C. A.; Witt, M.; Jaroszewski, J. W.; Franzyk, H. Expedient protocol for solid-

Olsen, C.A.; Witt, M.; Jaroszewski, J. W.; Franzyk, H. Diols as building blocks in solid-
phase synthesis of polyamine toxins by Fukuyama-Mitsunobu alkylation. SYNLETT 2004,
473-476.

Olsen, C. A.; Witt, M.; Jaroszewski, J. W.; Franzyk, H. Solid-phase synthesis of rigid 
acylpolyamines using temporary N-4,4'-dimethoxytrityl protection in the presence of 

Petersson, K.; Pedersen, B. T.; Stærk, D.; Krogfelt, K. A., and Larsen, C. N4-
alkyloxycarbonylderivatives of cytosine: physicochemical characterisation, and cytosine 
regeneration rates and release from alginic acid gels. Eur. J. Pharm. Sci., 2004, 23, 337-
345.

Simonsen, H. T.; Adersen, A.; Bremner, P.; Heinrich, M.; Smitt, U. W.; Jaroszewski, J.


Isolation of a library of aromadendranes from Landolphia dulcis and its characterization 

Ziegler, H.; Hansen, H. S.; Stærk, D.; Christensen, S. B.; Hägerstrand, H.; Jaroszewski, J.
W. The antiparasitic compoundlicochalcone A is a potent echinocytogenic agent that 
modifies the erythrocyte membrane in the concentration range where the antiplasmodial 

Ziegler, H. L.; Franzyk, H.; Sairafianpour, M.; Tabatabai, M.; Tehrani, M. D.; 
modifying agents and the inhibition of Plasmodium falciparum growth: structure-activity 


2003


Bringmann, G.; Dreyer, M.; Faber, J.; Dalsgaard, P. W.; Stærk, D.; Jaroszewski, J. W.; Ndangalasi, H.; Mbago, F.; Brun, R.; Reichert, M.; Maksimenka, K.; Christensen, S. B. Anzistrotanzanine A, the first 5,3'-coupled naphtylisoquinoline alkaloid, and two further,
5,8’-linked related compounds from the newly described species *Ancistrocladus tanzaniensis*. *J. Nat. Prod.* 2003, 66, 1159-1165.


2002


Appendix B

CV's of researchers involved in the central research area:

Jerzy W. Jaroszewski

Curriculum vitae
(short version)

Further information: see www.dfuni.dk/NPR

Born 1950.

M.Sc. (Chemistry) 1976 (University of Copenhagen).
Ph.D. (Chemistry of Natural Products) 1980 (University of Copenhagen).
Assistant Professor at the Royal Danish School of Pharmacy from 1980.
Associate Professor at the Royal Danish School of Pharmacy from 1982.
Research Associate Professor at the Royal Danish School of Pharmacy 1985-1988.
Visiting Associate at National Cancer Institute, National Institutes of Health, Bethesda, Maryland, USA, 1988 -1990.
Alfred Benzon Senior Research Fellow 1989-1990.
Guest Professor at Georgetown University School of Medicine, Washington DC, USA, autumn 1990, autumn 1991, winter 1994.
Senior Research Fellow at the Royal Danish School of Pharmacy 1995-1997.
Full Professor at The Danish University of Pharmaceutical Sciences from 1997.
Head of Department of the Department of Medicinal Chemistry, The Danish University of Pharmaceutical Sciences, 2002-2005.

CURRENT SCIENTIFIC INTERESTS

Drug discovery based on natural products, NMR spectroscopy, LC-NMR, NMR-based metabonomics, synthesis of analogues of polyamine wasp toxins.

TEACHING

Twenty-five years of experience in academic teaching including examinations, writing of teaching material and creation of new curricula (natural products, bioorganic chemistry, spectroscopy). Elected Teacher of the Year 1997. External examiner for M.SC. and Ph.D. theses in Denmark and abroad. Educated about 50 M.Sc. students, over 20 Ph.D. students.

ADMINISTRATION

Member of the University Board for 4 year, head-of-department in two 4-year periods, management of center grants, leadership of the NMR laboratory at DFU. Member of Editorial Advisory Board of Planta Medica and Natural Product Communications.

PUBLICATIONS

About 140 articles in peer-reviewed international journals, 1 patent, 6 book chapters, editor of 1 book, 17 popular articles in Danish.
Curriculum vitae

Søren Brøgger Christensen

Born August 19th 1947.

Cand. Pharm. (M.Sc.) from the Danish University of Pharmaceutical Sciences: 1971
Lic.pharm. (Ph.D.) from the Danish University of Pharmaceutical Sciences: 1975

Lektor (associate professor) at the Danish University of Pharmaceutical Sciences: 1976
Fellowship at the National Cancer Centre, Tokyo: May 1986
Fellowship at the German Cancer Research Centre, Heidelberg: Nov. 1990
Docent (reader) at the Danish University of Pharmaceutical Sciences: 1991
Censor (officially appointed censor) at the Technical University, Denmark: 1991 – present and at Royal Veterinary and Agricultural University.

Member of The Danish Academy of Natural Sciences 1991.
Chairman of the Department of Medicinal Chemistry, Danish University of Pharmaceutical Sciences: 1992 - 1995

Recipient of The H. C. Ørsted Award, June 1971.

Author or coauthor on 123 articles in scientific journals, coeditor on 2 books and coinventor on 6 patents.

In 1975 S. Brøgger Christensen (SBC) initiated work on natural products chemistry with emphasis on biologically active natural products. In 1978 the first paper on the SERCA inhibitor thapsigargin, which has become a standard tool for studies on calcium homeostasis, was published. Since 1978 SBC have been engaged in isolation, structure elucidation and biological evaluation of thapsigargin and naturally occurring analogues of thapsigargin and in systematic semisynthetic changes of thapsigargin in order to elucidate the structure activity relationships. In 1988 SBC published the generally accepted structure of thapsigargin. Presently prodrugs of thapsigargin are prepared in order to develop drugs for treatment of prostate cancer. Analogues with high affinity for the thapsigargin binding site on the Sarco/endoplasmic reticulum ATPase have been designed and synthesized.

In 1989/90 SBC extended his studies to enclose natural products usable for treatment of tropical diseases. A number of molluscicidal coumarins and saponins have been isolated and structure elucidated. Some antiparasitic chalcones have been isolated. Analogues are prepared and medicinal chemical studies are undertaken to optimise the antiparasitic activities. The work on chalcones formed a part of the intellectual properties behind the formation of the biotechnological company Lica Pharmaceuticals A/S. Neolignans have been synthesized and tested for antiplasmodial activities.

Studies on rose hips (Rosa canina) has revealed the presence of an antiinflammatory lipid, which might explain the clinically observed rheumatic pain releasing effect of the drug.
Curriculum vitae
Anne Adersen

Personal data

Education
M.Sc. (Pharmacy), The Royal Danish School of Pharmacy, Copenhagen 1970.

Occupations
September 1970 onwards employed at Department of Pharmacognosy / Department of Medicinal Chemistry at The Danish University of Pharmaceutical Sciences. Associate professor 1975.
February 1974 – February 1975 field studies on the Galápagos Islands, leave from DFU
February 1977 – August 1977 visiting scientist at the Charles Darwin Research Station in the Galápagos islands. Financed by the Development Research Foundation.
February - May 1987, January - April 1990
Field studies in The Galápagos Islands. Financed by Julie von Müllen’s Foundation.

Memberships
Member of the Subcommittee on Pharmacognosy, The Danish Pharmacopoeia Commission

Publications
30 articles in peer-reviewed journals and more than 20 articles dealing with herbal remedies.

Research interests
Occurrence, distribution and bioactivity of secondary compounds in plants, with emphasis on ethnopharmacology, ecology and biological variation.
Quality control of herbal remedies.
Curriculum vitae for Dan Stærk

Address:
Department of Medicinal Chemistry (priv): Perlestensvej 7
The Danish University of Pharmaceutical Sciences DK-3540 Lyngby
Universitetsparken 2, DK-2100 Copenhagen (+45) 48 18 70 77
Phone: (+45) 35 30 64 13; Fax: (+45) 35 30 60 00
E-mail: ds@dfh.dk

Personal data:

Education:
• 1994: B.Sc. Bachelor project: Thermostability of 6-phosphogluconate dehydrogenase from the thermophilic Synechococcus sp.
• 1997: M.Sc. Master project: 1H-NMR studies of bis-intercalation in DNA.
• 1997-2000: Ph.D.-student at The Danish University of Pharmaceutical Sciences, incl. visit at Professor Jeremy K. Nicholson's laboratory at Imperial College in London.

Employments:
• 2000-2003: Assistant Professor at Department of Medicinal Chemistry at The Danish University of Pharmaceutical Sciences.
• 2003-: Associate Professor at Department of Medicinal Chemistry at The Danish University of Pharmaceutical Sciences.

Scientific/educational activities:
• More than 30 scientific papers and one book chapter.
• More than 30 presentations at international and national conferences on drug research, NMR spectroscopy, and pharmacologically active natural products.
• Awarded “Hede Nielsen prisen” in 2004
• "Teaching and learning" and "Higher Education Teaching and Teaching Practice" (Course at The Danish University of Pharmaceutical Sciences)
• Awarded the prize "best teacher of the year" in 2001 at The Royal Danish School of Pharmacy.

Research interests:
• Hyphenation of separation methods and spectroscopic techniques for advancing dereplication of secondary plant metabolites. Emphasis is on hyphenation of high-performance liquid chromatography and solid-phase extraction with nuclear magnetic resonance spectroscopy and mass spectrometry (HPLC-SPE-NMR-MS)
• Metabonomics: Multivariate analysis of 1H NMR spectroscopic and chromatographic data for investigation of metabonome components in biofluids and plant extracts.
• Research is targeted towards compounds with activity againstcancer, central nervous system diseases, and parasitic diseases (antimalarial, antileishmanial and antitrypanosomal).
Henrik Franzyk, Associate Professor

**Phone/Fax:** (+45) 3530 6255 and (+45) 3530 6040, respectively  
**E-mail:** hf@dfuni.dk  
**Location:** Department of Medicinal Chemistry, Building 30, Jagtvej 162.

Curriculum vitae

**Education**

1991: M. Sc. Engineering (Chemistry; Cand. polyt.) at The Technical University of Denmark  
Master project: Biosynthesis Studies in Scrophulariales

1993: Ph.D. (Natural Products Chemistry) from The Technical University of Denmark  
Thesis: An Investigation of the Biosynthesis of Secoiridoid Glucosides in the Olive Family. Advisor: Docent Søren Rosendal Jensen

**Employments**


1997: Post doc at Colorado State University, Fort Collins (six months) with Professor Frank Stermitz


2000-: Associate professor at Dept. Medicinal Chemistry, The Danish University of Pharmaceutical Sciences

**Awards and Grants**

The Gorm Petersen Memorial Award (for Ph.D. thesis), 1993  
Talent Project (3.0 mio. Dkr.) entitled "Solid-Phase Synthesis of Neuroactive Polyamine Derivatives" from The Technical Research Council (STVF), 2000  
Carlsberg Foundation, 2001 and 2002 (150.000 Dkr and 160.000 Dkr, respectively)

**Research interests**

In general my research interests are total synthesis of natural products and the utilization of natural products as starting materials or as chiral-pool building blocks in the synthesis of compounds with a potential biological activity. Currently, my main research projects comprise the development of novel solid-phase organic chemistry procedures and their application in structure-activity relationship (SAR) studies of analogues of biologically active lead compounds obtained from natural sources.
CURRICULUM VITAE

Anna Katharina Jäger
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The Danish University of Pharmaceutical Sciences
2 Universitetsparken
DK-2100 Copenhagen O
Phone: +45 35 30 6339 / Fax: +45 35 30 6041
E-mail: ankj@dfuni.dk


EDUCATION
M.Sc. (Pharmacy), The Royal Danish School of Pharmacy, Copenhagen, 1991.
Ph.D (Pharmacy), The Royal Danish School of Pharmacy, Copenhagen, 1993.

WORK EXPERIENCE
1993 - 95 Post-Doctoral researcher at the Department of Botany, University of Natal
Pietermaritzburg, South Africa
1995 - 98 Researcher at the Department of Botany, University of Natal
Pietermaritzburg, South Africa.
1996 - 98 Part-time lecturer at the Department of Botany, University of Natal
Pietermaritzburg, South Africa
1998 Maternity leave (3 months)
1999 - 02 Senior lecturer at the School of Botany and Zoology, University of Natal Pietermaritzburg
01.03.02 - Associate Professor, Department of Medicinal Chemistry, The Danish
University of Pharmaceutical Sciences, Copenhagen

PUBLICATIONS
97 articles in peer-reviewed journals (mainly dealing with pharmacological activities of
plants used in traditional medicine and isolation of active compounds). 6 book chapters.
106 conference contributions.

STUDENTS GRADUATED – LAST FIVE YEARS
4 Ph.D, 5 M.Sc and 11 M.Pharm students have graduated under my supervision.
Currently 3 Ph.D. and 10 M.Pharm students are registered.
Per Mølgaard
CURRICULUM VITAE

Born April 6, 1942 married to Karen Christensen, three adult children

1969 Cand.agro. (Agronomist)

Positions
1969-72 Postgraduate study at the Dept. of Botany, Danish Agricultural University.
1972-now Employed by Department of Pharmacognosy, Royal Danish School of Pharmacy. Associate professor 1974. Head of Department in 1989.
1983-86 Research Fellowship at the Royal Danish School of Pharmacy with the project: *Caffeic Acid in Natural Plant Protection.*

Memberships: Danish Botanical Society, board member 1982-96, chairman 1992-96
ITEX - International Tundra Experiment, coordinating secretary 1992-
DANFYT - Danish Society for Phytotherapy, founding committee
BES - British Ecological Society, ord. member since 1976
AETFAT - Association for the Taxonomic Study of the African Flora,
Danish contact person regarding ethnobotanical studies
IUBS - International Union of Biological Sciences. Danish national representative for Botany.

Censorships: External examiner for doctorate theses (ph.d.) and project students at University of Aarhus and the University of Gothenburg
External examiner for undergraduate students in botany and research projects at University of Copenhagen.
Internal examiner for ph.d. - students at the Danish Univ. of Pharm. Sci.

Facultative referee for: Acta Tropica - Biochemical Systematics and Ecology
Journal of Agricultural and Food Science - Phytochemistry

Teaching responsibility: Botany, pharmacognosy, phytochemistry, chemotaxonomy.

Research projects: Phytochemical ecology, esp. regarding caffeic acid and salicin derivatives
Medicinal plants and their potential for production of plant chemicals
Secondary plant compounds and herbivory in the Arctic
International Tundra Experiment, ITEX
The Endod Project for control of schistosomiasis transmitting snails
Special Chemicals and Pharmaca from Plants
Mapuche plants for traditional medicine and biodiversity in Chile

Student projects and Ph.D. studies have been carried out in relation to these activities Supervisor for four ph.d. students and more than 20 master students the last five years
More than ninety publications of which some fifty are in international scientific journals
Popular presentations in newspapers, magazines, books and public lectures
Participation in radio and television programmes released by DR-TV.
Curriculum vitae – Hanne Lindvig Ziegler

**Personligt:** Dansk kvinde, født den 12. april 1972 i Hørsholm

Bor sammen med min mand Hasse og søn Johan på adressen:

Nøjsomhedsvej 19, 4.th  
2100 København Ø  
Tlf.: 35 42 81 04  
Email: hanne.z@get2net.dk

**Sprog:** Taler og skriver flydende dansk og engelsk

**Nuværende ansættelse:**

**Uddannelse og relevante kurser:**
* Forsøgsdyrskursus 16 januar – 2. februar 2006  
* Kursus i patentering og kommercialisering 25-26. oktober 2005  
* Celledyrkningskursus 26.-29. januar 2004  
* Adjunktpædagogikum afsluttet februar 2004  
* Universitetspædagogisk kursus gennemført august-december 2003  
* Ph.d. grad fra Danmarks Farmaceutiske Højskole (DFH), 2002 *Antiplasmodial activity of natural products: Effect of incorporation into erythrocyte membrane*  
* Cand. pharm. DFH 1999

**Forskningsinteresser:**
Mine hovedinteresser ligger indenfor farmakologisk evaluering af bioaktive naturstoffer og andre metabolom komponenter. Implementering af nye *in vitro* assays til at måle disse aktiviteter som en hjælp ved bioaktivitetsstyret fraktionering af planteekstrakter og opnåelse af IC$_{50}$ værdier for isolerede stoffer er en vigtig del af min forskning. Forbedring af nye og implementerede *in vitro* assays, undersøgelse af membranændringer induceret af naturstoffer samt celledyrkning er også en vigtig del af min forskning.

**Tidligere jobs:**
* Medansvarlig for instituttets cellerum fra april 2003 til juni 2004  
* Amanuensis på Institut for Medicinalkemi, DFU, fra 1. januar til 31. maj 2003. Laboratoriekursus i organisk kemi, syntese  
* Amanuensis på Institut for Medicinalkemi, DFH, fra 1. oktober til 31. december 2002. Laboratoriekursus i organisk kemi, identifikation  
* Medlem af bestyrelsen på Institut for Medicinalkemi et år fra februar 2001-2002