

# CURRICULUM VITAE of

## ANNE GROBLER

### 2014

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**1. PERSONAL DETAILS:**

Name	Anne Frederica Grobler
<u>Addresses</u>	
(i) Work	DST/ NWU Preclinical Drug Development Platform Potchefstroom Campus North-West University Potchefstroom 2531
(ii) Residential	42 Koedoesfontein 478 IQ North West Province
(iii) Postal	PO Box 19430 Noordbrug 2531 South Africa
Tel	+27(18) 299 4467 (w) +27(56) 818 1274 (h) +27 82 9292340 (cell)
e-mail	<a href="mailto:anne.grobler@nwu.ac.za">anne.grobler@nwu.ac.za</a>
Date of birth	14 August 1954
Place of birth	Potchefstroom, South Africa
ID number	5408140007089
Citizenship	South African
Languages	English, Afrikaans (verbal & written)
Drivers License	08, B

**2. BIOGRAPHICAL SKETCH: Anne F Grobler**

I am a South African citizen with a Ph.D. in Pharmaceutics (North-West University) and an M.Sc. in Medical Biochemistry (Stellenbosch University). My research interests are the design, construction and optimization of nanomedicines and bioagricultural delivery systems, as well as the preclinical evaluation of such systems. I started my career as a scientist at the Centre for Molecular & Cellular Biology, Medical School, University of Stellenbosch (1991 – 1997), where I taught Molecular Biology. From 1997 to 1999, I managed of the Confocal Imaging Facility at the South African Medical Research Council, and was Project Manager for the DST Year of Science and Technology for the Western Cape. From 2000 to 2003 I was the Head of research at MeyerZall Laboratories in George, South Africa, where I was responsible for the generation of value-added intellectual property, new product design and the management of efficacy studies and clinical trials. The exploration of the Pheroid technology platform initiated at MeyerZall Laboratories was expanded at the North-West University, which I joined in January 2004 as senior scientist. In 2010 I was appointed as associate professor in Dept of Pharmaceutics and as coordinator of commercialization for the Faculty of Health Sciences. Since the beginning of 2013 I was the director of the DST/NWU Preclinical Drug Development Platform. I was a co-author and part of the steering committee of the Synthetic Biology of DST and also a co-author of the South African Bio-Design Initiative (SABDI). In 2014 I established the Safety Pharmacology Society Group for South Africa together with Boehringer Ingelheim and the international Safety Pharmacology Society. I also authored/co-authored 31 peer-reviewed international publications and book chapters and numerous international and

national conference proceedings. My passion for innovation is reflected in the NWU patent portfolio; I am the main inventor/author of 7 patents granted in multiple countries and inventor of 2 patents still under examination.

I committed myself to several projects and collaborations, national and internationally. I also obtained funding from both governmental (DST, TIA, Innovation Fund, NRF, bi- and trilateral agreements) and industrial sources towards building infrastructure and innovation from 1998 – 2014 to the amount of R97,928,890.30.

I attended the World Basic and Clinical Pharmacology Congress during July 2014 and made a substantial contribution, 3 of our posters was presented.

My achievements include: Winner of the NSTF/BHP Billiton Awards for her contribution to SETI over the past 5 to 7 years (2014); Winner of Swiss Biotechnology Innovation Competition and Participant in Innovation Management School, Switzerland (2011); Vice-Chancellor's Honorary Award for "Enhancement of the action of anti-infective agents" and for "Enhancement of the action of anti-inflammatory agents" forming the subjects of 2 international patents (2010) and Runner-up: Emory University / DST Bioplan competition (2009).

### 3. PROFESSIONAL EXPERIENCE

1 Jan 2013 - current	Director: DST/NWU Preclinical Drug Development Platform (PCDDP)	North-West University, Faculty of Health Sciences, Potchefstroom Campus, Potchefstroom, South Africa
1 Sept 2012 – 31 Dec 2012	Acting director: DST/NWU Preclinical Drug Development Platform (PCDDP)	
1 May 2012- current	Full professor in Pharmaceutics	
1 May 2011- current	Coordinator of Implementation of Expertise & Commercialization	
Jan 2014 – current	Interim coordinator of NWU Bioeconomy Initiative	
1 Jan 2010 - current	Associate professor	North-West University, School of Pharmacy, Faculty of Health Sciences, Potchefstroom, South Africa
1 April 2008 – 31 Dec 2010	Snr Subject specialist	North-West University, School of Pharmacy, Faculty of Health Sciences, Potchefstroom, South Africa
1 Jan 2004 – 31 March 2008	Senior scientist/researcher	North-West University, School of Pharmacy, Faculty of Health Sciences, Potchefstroom, South Africa
1 Jan 2000 – 30 Nov 2003	Head of Research	MeyerZall Laboratories, George, South Africa
1 Jan 1998 – 31 Dec 1998	Project manager	DST Year of Science and Technology, Western Cape Province, South Africa
1 Jan 1997 – 31 Dec 1999	Manager: Confocal Facility Researcher: Outreach	Experimental Biology Group, SA Medical Research Council, Tygerberg, South Africa

1 Jan 1998 – 31 Dec 1996	Scientist	Centre for Molecular & Cellular Biology, Medical School, University of Stellenbosch, Tygerberg, South Africa
1 Jan 1998 – 31 Dec 1983	Research Assistant	

## 4. ACADEMIC AND PROFESSIONAL QUALIFICATIONS

### 4.1 Secondary Education

Name of High School : Gimnasium High, Potchefstroom  
 Matriculated : 1971  
 Subjects passed : Afrikaans, English, German, Mathematics, Science and Biology

### 4.2 Tertiary Education

2009	Philosophiae Doctor in Pharmaceutics	North-West University
1993	M.Sc in Medical Biochemistry	Stellenbosch University (Distinction)
1979	B.Sc Hons Biochemistry	Potchefstroom University for CHE
1978	B.Sc: Biochem, Chem Physiology	Potchefstroom University for CHE UNISA

## 5. GENERAL MANAGEMENT EXPERIENCE

### 5.1 Current management positions

- Director: DST/NWU Preclinical Drug Development Platform (2010 – Current). Responsible for establishing the national platform, including tasks such as communicating with DST and NWU management, staff appointment, facility planning and implementation of both upgrading of facilities and building of new facilities, training of staff in required skills, financial management, quality control, communication with clients, internationalisation of platform services.
- Coordinator:
  - Interim – NWU Bioeconomy Strategy (Jan 2014 – current)
  - Coordinator of commercialisation, Faculty of Health Sciences (2011 – current).
  - B.Sc Hons Course in Med Biochem, 1996
- Project Manager:
  - TIA Project: Rapid Diagnosis of Tuberculosis in Resource poor settings. 2012 – current.
  - TIA Project: Investigation into drug resistance reversal of antimalarials using Pheroid™ technology. 2010 – 2012.
  - Innovation Fund in Project T90020 (2009 – 2010). Principle Investigator in Project T60042 (2007 – 2009) [30 staff and student members]. Responsible for project staff/student appointment and management, job creation and descriptions, financial management, quality control, project marketing and commercialisation activities.
  - Drug evaluation Focus group of SAMI (2010)
  - Development of novel vaccines (2002-2003)

- Phase 1 tuberculosis Clinical Trials (2001-2002)
- Year of Science and Technology, Western Cape, 1998
- Media Campaign for YEAST' 98 in the Western Cape, 1998
- Manager:
  - Division Manager : Research, MeyerZall Laboratories, 2002-2003
  - Facility Manager : Confocal Microscopy Facility, 1997-1999
- Supervisor/co-supervisor for 27 postgraduate students (Masters, Doctoral and Post Doctoral Fellows) from 2004 – present at the NWU and other Institutions (Universities and CSIR).
- Steering committee member for:
  - South African/Argentina bilateral agreement – nanoscience (2013)
  - Indo/South African bilateral agreement on IKS (2012)
  - South African Biodesign Initiative (2011 – current)
  - NECSA/ NTembi Consortium (2010 – current)
  - NuGrainSA consortium (2010 – 2011)
  - NWU Campus Commercialisation (2011)
  - NWU Food and nutritional security initiative (2011)
  - Synthetic Biology Initiative (2007 – 2011)
  - South African Malaria Initiative (SAMI; 2010 - 2011)
  - DST Synthetic Biology, Structural Biology & Functional Genomics (2010-current)
- Panel reviewer: CSIR Manufacturing & Polymer Sciences (2008, 2009, 2010, 2011, 2012)
- Director of companies and shareholder:
  - Sheckels Trading 11 (Pty) Ltd
  - Nelesco 882 (Pty) Ltd
- Principle Investigator / Organizer
  - Innovation Fund Project T60042 (2007-2010)
  - South African/Hungarian bilateral workshop (2011)
  - Workshop on laser-based analytical investigation (2005, 2009)
  - SASCON Science and Report Writing Workshop, 1998
  - MRC participation in Career Day, Goodhope Centre, 1998
  - Fluorescence and Confocal Microscopy Workshop, 1997
  - Science is Cool Day, Western Cape, MRC, 1997
  - Teachers' Science Education Symposium, 1996
- Chairperson
  - Science Councils and Tertiary Institution Forum Portfolio of the Western Cape Science Education Forum, 1994-1995
  - Ratepayers' & Residents' Association of Penhill, 1991- 1993
  - Resident Industrial Relation Subcommittee of the Regional Council of Stellenbosch/Penhill, 1990-1993
  - PU for CHE Writers' Association, 1978-1980
- Editor
  - Biochemistry in Southern Africa (BISA), 1981
  - LENS literary journal, PU for CHE 1978-1980

## 6. ACADEMIC ACTIVITY AND EXPERIENCE

### 6.1 Teaching-learning experience

At the moment I have no formal teaching obligations but am promoter or study leader of postgraduate students. My teaching experience is described below.

#### 6.1.1. Undergraduate and postgraduate teaching

- MB ChB and B.Med.Sci; University of Stellenbosch (1981-1989):
  - (i) The theoretical basis of genetics and genetic diseases
  - (i) Molecular Biology in Medicine
  - (ii) Protein Synthesis
  - (iii) Regulation of Gene Expression
  
- B.Sc Hons (Medical Biochemistry): Presenter and convener of the following mini-courses at the Universities of Stellenbosch and Western Cape
  - Cellular Biology, Cytoskeleton, Extracellular Matrix, Cell Motility and Mobility, Fluorescence Microscopy, Confocal Microscopy.
  
- M.Med (Molecular & Cellular Biology): Presenter of mini course on the theoretical basis of genetics and genetic diseases, University of Stellenbosch (1989-1996).

#### 6.1.2 Postgraduate guidance of students & research-based courses

##### Promoter

- Barkhuizen, M. An affordable tool for early diagnosis of Parkinson's disease. Ph.D. (Pharmaceutics). 2014 - 2016
- Mutingwendi, A. An affordable tool for rapid TB diagnosis. Ph.D. (Pharmaceutics). 2013 – present.
- Rambanapasi, C. The biopersistence of gold nanoparticles. Ph.D. (Pharmaceutics). 2012 – present.
- Chelopo, P. Pharmacokinetics of nano-based drug delivery systems for tuberculosis. Ph.D. (Pharmaceutics). 2012 – present.
- Swanepoel, B. An investigation into the use of radiopharmaceuticals to determine the body distribution antimalaria compounds formulated in Pheroid™ technology. Ph.D. (Pharmaceutics). 2011 – present.
- Grobler, P. An investigation into the differential body distribution of tuberculosis compounds and Pheroid™ with the use of radiopharmaceuticals. Ph.D. (Pharmaceutics). 2011 – present.
- Gibhard, L. An investigation into the comparative bioavailability of Pheroid™ –based chloroquine- and amodiaquine formulations in a primate model. Ph.D. (Pharmaceutics). 2009 – 2012.
- Grobler, L. An investigation into the comparative bioavailability of Pheroid™ –based artemisinin formulations in a primate model. Ph.D. (Pharmaceutics). 2009 – 2013.

##### Study leader

- Van As, A. Optimization of Pheroid formulations for radiotracers. M.Sc. (Pharmaceutics). 2014

- Jakoet, A. A combined nano-sized delivery system for improved uptake of Mycobacterium avium complex therapeutics into macrophages. M.Sc (Pharmaceutical Chemistry) 2012 - present
- Mandiwana, V Selected radiotracers as imaging tools for the investigation of nano-sized delivery systems M.Sc.(Pharmaceutics) 2012 - present
- Schoeman, I. Qualification of in house prepared,  $^{68}\text{Ga}$  RGD in healthy monkeys for subsequent molecular imaging of  $\alpha_v\beta_3$  integrin expression in patients. M.Sc (Pharmaceutics) 2011 - present
- Wilkin, D. The use of Pheroid™ technology in the treatment of mastitis in dairy herd. M.Sc. (Pharmaceutics). 2012- present.
- Nieuwoudt, LM. The impact of Pheroid™ technology on the bioavailability and efficacy of anti-tuberculosis drugs in an animal model / L. Nieuwoudt. M.Sc. (Pharmaceutics).
- Van der Merwe, H. Evaluation and validation of in vitro assays to determine cell viability for HIV/AIDS experimentation with Pheroid™ technology
- Padayachee, S, The design. of a pilot facility for the production of pheroid based products in an academic environment
- Matthee, L. A preclinical evaluation of the possible enhancement of the efficacy of antituberculosis drugs by Pheroid™ technology. M. Sc. (Pharmaceutics). 2006 – 2007.
- Botha, M. Preclinical evaluation of the possible enhancement of the efficacy of antiretroviral drugs by Pheroid™ technology. M. Sc. (Pharmaceutics). 2006 – 2007.

#### **Co-promoter/ help-promoter and co-leader**

- Elgar, D. Evaluation of the preclinical effects of perorally administered pro-Pheroids. Ph. D. (Pharmaceutics). 2006 – 2008.
- Botes, A. Transdermal delivery of isoniazid and rifampicin by pheroid technology / M. Sc. (Pharmaceutics). 2005 – 2007.
- van Dyk, CP. Transdermal delivery of 5-Fluorouracil with Pheroid™ technology. M. Sc. (Pharmaceutics). 2005 – 2008.
- H Coetzee. Transdermal delivery of arginine vasopressin with Pheroid™ technology. 2005-2007.
- Van der Walt, M.E. Transdermal delivery of Acyclovir and Ketoconazole by Pheroid™ technology. 2007-2008.
- Neethling, C.E. Effect of Brij 97 in the presence and absence of carrageenan on the transdermal delivery of 5-fluorouracil. 2004-2005.
- LT Fox, L.T. 2009. Pheroid™ technology for the topical application of selected cosmeceutical activities. 2008-2009.
- Cassim, R. Method development and stability of pheroid-based anti-retroviral formulations. M. Sc. (Pharmaceutics). 2005 – 2007.

#### **6.1.3 Examiner**

- Nuugulu, LM 2013 Growth and Physiological response of amaranth seedlings to temperature and drought stress. MSc (Agriculture), University of the Free State, Bloemfontein, South Africa.



- Babst, S. 2012. Mitochondrial DNA consensus sequence for the Tswana population of South Africa. Ph.D. (Biochemistry). North-West University, South Africa.
- Uys, C.E. 2006. Preparation and characterisation of Pheroid vesicles. MSc Dissertation. North-West University, South Africa.
- Truter, E. Chitosan derived formulations and Emzaloid Technology for mucosal vaccination against diphtheria: nasal efficacy studies in mice. M. Sc. (Pharmaceutics). 2003 – 2005.
- Van der Westhuizen, E. Chitosan derived formulations and Emzaloid Technology for mucosal vaccination against diphtheria: oral efficacy studies in mice. M. Sc. (Pharmaceutics). 2003 – 2005.

#### 6.1.4 Post Doctoral Fellows

- Mehta, A. 2014 – to start August 2014
- Florentine, H 2014 – to start September 2014
- Barnard, N. 2012 – current. Pheroid formulation
- Levanets, O. 2011 - current. Molecular diagnostics of Tuberculosis
- Mensah, P. 2008 - 2011. Tuberculosis trials and diagnosis

#### 6.1.5. Interns

- Vermeulen, U. 2013 – current. Chemical engineering of TB diagnostic lysis.

### 6.2 Own research direction and projects

#### 6.2.1. Experienced in:

- Formulation of drugs and agricultural remedies;
- Molecular biology, biochemical and genomic techniques;
- Clinical trials from design to reporting to the Medicine's Control Council;
- Pharmaceutical regulatory affairs and primary product development
- Project creation from protocol design to consolidation
- Validation of procedures and quality assurance;
- Tissue and organism culture techniques; and
- Microscopy including confocal laser scanning microscopy, scanning electron microscopy.

#### 6.2.2 Computer literacy

##### Well versed in:

- Windows, including Windows 7
- OS systems for Apple Mac
- MS office, including Word, Xcel, Powerpoint, MS Office
- Macromedia, including Flash
- Scientific programs including databases, Ubuntu and statistical programmes

#### 6.2.3 Current Projects & collaborations

- (i) Pheroid™ technology and drug formulation development for infectious disease:
  - **Swiss co-workers:** Prof Reto Brun & Dr Sergio Wittlin of the Swiss Tropical and Public Health Institute, Basel Switzerland: The Pheroid™-based reversal of drug resistance of chloroquine

- **Hungarian co-workers:** Prof Gyozo Garab and Dr Atilla Botha :Hungarian Academy of Science & Technology and EU Centre of Excellence: Pheroid™-based applications in Synthetic Biology
- **South African co-workers:**
  - Proff Pete Smith and Kelly Chibale, Dr Lubbe Wiesner, University Cape Town, MMV and SAMI: *In vitro* and *in vivo* evaluation of new antimalarial compounds and anti-tuberculosis compounds.
  - NTeMBI Consortium (Dr Neil Jarvis); Development of Pheroid™-based radiopharmaceutical techniques for application in infectious disease treatment
- (ii) The development of a new TB diagnostic kit.
  - **USA co-workers:**
    - Prof Henk Viljoen of University of Nebraska,
    - Streck Inc, Nebraska, Omaha.
- (iii) Combination nano-technologies for the treatment of *Mycobacterium Avium* in HIV patients. **IBSA SA co-workers.**CSIR (Dr Seann Moolman and Hulda Zwai):
- (iv) Drug safety and tolerance, pharmacokinetics.
  - **German co-workers:** Drs Brian Guth and Achim Sauer, Boehringer Ingelheim, Biberach.
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#### 6.2.4 Previous projects, collaborations and consultations

- (i) Ithemba Pharmaceuticals (Dr Chris Edlin); Formulation of a novel tuberculosis compound.
- (ii) Capsugel (Pfizer): Optimization of *peroral* liquid dosage form for Pheroid™ technology.
- (iii) Development of novel vaccines: BIOVAC Institute: Prof Johann Grooten, Universities of Pretoria and Gent, Belgium: Development of new tuberculosis vaccine.
- (iv) Prof Paul van Helden, Prof Peter Donald, Prof Lafras Steyn, Prof Pete Smith, Departments of Medical Biochemistry – US, Paediatrics and Child Health –US, Pharmacology-UCT, MeyerZall Laboratories: The extended early bactericidal sterilizing activity and bio-availability of isoniazid, rifampicin, pyrazinamide and ethambutol as formulated in the Emzaloid™ drug delivery system of MeyerZall (Pty) Ltd during the first four weeks of treatment in patients with sputum microscopy smear- positive pulmonary tuberculosis compared to that of the fixed dose combination (Rifafour™) of the same dose as registered for use in South Africa.
- (v) Prof Anna-Lize Williams, Dept. Virology UCT, MeyerZall Laboratories: HIV vaccine Development Programme.
- (vi) Prof Ed Rybicki , Dept of Molecular and Cellular Biology and Prof Anna-Lize Williams, Dept. Virology, - UCT & MeyerZall Laboratories: HPV vaccine Development Programme.
- (vii) Prof U Chikte, Prof S Grobler, Research Institute of Dentistry, Tygerberg Medical School: Investigating new materials applicable to dentistry.
- (viii) Dr J Saunders, Meyer Zall Pharmaceuticals: A Unique liposome-like delivery system.
- (ix) Dr J Smith and Dr J Schneider: Departments of Paediatrics, Obstetrics and Anatomical Pathology, Medical School, Tygerberg: A clinical, biochemical and 3Dreconstruction

investigation of postnatal lung development in normal infants and infants from pregnancies manifesting with abnormal umbilical flow.

- (x) Mr B Hendry and Ms S Dittke, Engineering Faculty, Peninsula Technikon; Investigating a mini a bio-converter for breaking down phenols in chemical wastes.
- (xi) Prof S Grobler ( Faculty of Dentistry, US), Dr Desi Moodley (East London) and Dr T Aalbers (London, UK); Cause of damage to adhesives in fillings.
- (xii) Proj Y Chittke, University of Stellenbosch; Diagnosis of subsurface lesions in teeth.
- (xiii) Dr Farret, Dept of Botany, University of Cape Town. Calcium in drought-resistant plants.
- (xiv) Dr Anne D'Albis, Embassy and Dr Ken Salo, Pentech: Development of Science and Technology disadvantaged communities.
- (xv) Dr Anita Naicker. Image Facility of the University of Natal.
- (xvi) Prof Sturm, MRC, Durban; AIDS, TB, STD research.
- (xvii) Dr Prokopczyk, Metabolic Biochemistry, American Health Foundation, New York.
- (xviii) Dr DK Daftary, TATA Institute of Fundamental Research, Bombay.
- (xix) Prof CW van Wyk, MRC/US Dental Research Institute.
- (xx) Prof G van der Horst, University of Western Cape and Mr J Brinders, Medunsa: Sperm aberrations in South African game.
- (xxi) Prof B Ryffle, University of Cape Town: Growth Factor Expression during infection with *Mycobacterium Tuberculosis* Prof C Els and Mr M Butterwoth: Activation of kidney endothelial cells by growth factors.
- (xxii) Dr M Lipinsky, Sea Fisheries, Dept of Environmental Affairs & Tourism: Investigation of environmental factors causing changes in the squid population of the West Coast, South Africa.
- (xxiii) Prof P Zilla and Mark Johnson, Cardiovascular Dept, University of Cape Town: Repopulation of polyurethane heart valves by human cells.
- (xxiv) Prof N Ealling, Dept of Biochemistry, University of Cape Town. The cytoskeleton of plants.

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## **7. IMPLEMENTATION OF EXPERTISE**

### **7.1 National initiatives**

#### **7.1.1 DST/NWU Preclinical Drug Development Platform for small animals**

With the support of the dean, responsible for:

- (i) arranging visits by review panel (international and local) to investigate applicability of NWU as host organization for this platform (2008-2009)
- (ii) compiling a business plan for the Platforms (2010)
- (iii) presenting the business plan to DST/NWU management (2010)
- (iv) making changes to business plan suggested after international review (2010)
- (v) arranging of legal obligations and contract to obtain R33 million from DST and R11 million from the NWU for the Platform (2010 – 2011)
- (vi) arranging a financial system acceptable to both NWU and DST (2010-2011)
- (vii) advertising for new appointments and setting up interview panels in consultation with human resources (2010 – current)
- (viii) establishment of managing structures for the Platform (2011- current)

- (ix) establishment of the required office and laboratory facilities in consultation with Physical Infrastructure and Planning and external contractors (2011-current)
- (x) reporting to DST, the Advisory Board, the dean and expert committees and task teams about the progress of the project and the use of the finances (2011-current)
- (xi) interaction with external clients; both commercial and academic (ongoing)
- (xii) compiling an application to establish the platform as independent structure within the Faculty of Health Sciences (2012).

### **7.1.2 Molecular diagnostics**

With the support of the Dean and her office, responsible for

- (i) obtaining the opportunity and funding to evaluate a novel thermocycler of Streck Inc (USA) for the rapid diagnosis of tuberculosis in resource poor settings (2010-2011)
- (ii) supporting the commercialization of the thermocycler (August 2011)
- (iii) developing new intellectual property with regard to the diagnostic process in collaboration with the University of Nebraska, Lincoln, Omaha, USA (2011 – current)
- (iv) compiling a business plan and obtaining funding of R1 026 000 from DST/TIA for developing TB diagnostics (2011)
- (v) consulting with Bill & Melinda Gates Foundation (2012).

### **7.2 Bilateral and trilateral agreement participant**

- (i) Swiss – South African bilateral agreement (2008 – current)
- (ii) Hungarian – South African bilateral agreement (2008 – 2011)
- (iii) India-Brazil-South African trilateral agreement (2007 – current)
- (iv) Preparatory visit to the UK and presentation on invitation by DST – Netherlands bilateral agreement on biotechnology (2012)
- (v) Preparatory visit to the UK and presentation on invitation by DST for South African – UK bilateral agreement on synthetic biology (2012)
- (vi) Participant in South African – Netherlands bilateral discussion on biomass conversion (2012).
- (vii) Pfizer / NWU (MOU) outlining the basis for potential scientific and technical collaborations

### **7.3 Business development**

With the support of the Technology Transfer office, responsible for

- (i) Out licensing of intellectual property to Sheckels Trading 11 (Pty) Ltd
- (ii) Generation of royalties from commercial license.

### **7.4 Intellectual property development**

Responsible for

- (i) the development and disclosing of intellectual property as part of research teams and their research
- (ii) the defense and maintenance of the Pheroid™ patent portfolio

### **7.5 Review Committees**

- Reviewer for the NRF evaluation centre.
- Reviewer for CSIR programmes on Nanoscience and Polymer Science

- Reviewer for the DST Career Path Development
- 

## 8. PROFESSIONAL AFFILIATIONS AND UNIVERSITY COMMITTEES

### 8.1 Memberships

Advisory Board of DST Preclinical Drug Development Platform	2012
South African Tuberculosis Research Innovation Initiative	2011- current
Southern African Malaria Initiative (SAMI)	2010 - current
Steering committee of the NuGrainSA Consortium	2010 - current
Steering committee of the South African Biodesign Initiative	2010 – current
Steering committee of the DST Synthetic Biology Initiative	2007 -2010
Controlled Release Society	2005– 2010
American Association of Pharmaceutical Sciences (AAPS)	2007 – 2010

### 8.2 University Committees

NWU Institutional Committee for Research and Innovation.  
Faculty Board of Health Sciences (NWU Potchefstroom Campus).  
Potchefstroom Campus Commercialisation Committee of the NWU.  
NWU Food and Nutritional Security Committee of the NWU Potchefstroom Campus.  
Implementation of Expertise Committee of the Faculty of Health Sciences of the NWU  
Action and Expertise Committees of the PCDDP  
Previous chairperson of the previous Commercialisation Committee of the Faculty of Health Sciences of the NWU Potchefstroom Campus

## 9. FUNDING AND FINANCIAL EXPERIENCE

### 9.1 Financial Management and Financial Administration, grants and contracts

- 2014 (i) TIA grant for the development of a TB diagnostic kit (R1,75 million for 2012-2014)  
(ii) NThembi consortium for Pheroid-based radiopharmaceutical research (R1.13 million; 2013-2014)  
(iii) Swiss/SA bilateral agreement: NanoCa/Pheroid project (R1.2 million on SA side; 2014-2015).  
(iv) IBSA; R 550 000 (for 2012 & 2014): Pheroid and TB/HIV therapy  
(v) Plandai Biotech (2014): Clinical evaluation of product.
- 2013: NWU Strategic funds for control of environmental conditions (R1.6 million).
- 2012 EU Nanogold R621 300 (for 2012): Risk assessment
- 2011 (i) NWU contribution to the DST/NWU Drug Development Platform (R11 million); **applicant and project and financial manager.**  
(ii) NWU Strategic Funds for establishment of a Bioinformatics Platform (R3 million); **applicant and project and financial manager.**  
(iii) NThembi consortium for Pheroid-based radiopharmaceutical research (R 360 000)

- 2010 (i) DST/NWU Drug Development Platform (R33 million from DST ); **applicant and project and financial manager.**  
(ii) Spectral confocal module from NWU strategic funds (R750 000)
- 2008 Swiss/SA bilateral and Innovation Fund grant for the development of a Pheroid™-based antimalarial therapy (R4307 583 – South African contribution); **applicant and project and financial manager.**
- 2007 Principle Investigator (assisting with financial and application and administration) for DST-IF Project T60042. 2007 – 2009. R 10 500 000.  
Confocal C1 laser scanning microscope from NWU strategic equipment funds (R 1.5 million)
- 2006 NWU strategic equipment funds BD FACS (R850 000)
- 2005 Confocal PCM2000 laser & computer upgrade from NWU strategic funds (R160000)
- 2000-2003 Private Sector, product development for pharmaceutical industry, including funding for Phase 1 human clinical trial
- 1998 DACST: Year of Science and Technology: tender (R5.8 million and R42 million in sponsorships and in-kind contributions)
- 1985-1996: MRC, Harry Crossley Foundation and National Cancer Association-Funded Projects:
- Collagen gene expression in inherited disease and cancer. MRC
  - Collagen gene expression and the nuclear matrix. Harry Crossley Foundation
  - Submucous Fibrosis: MRC, Harry Crossley Foundation
  - Oral Cancer in South Africans of Indian Extraction: NCA; Harry Crossley Foundation
  - Induction of MGMT DNA-Repair enzyme by DNA adduct-causing agents: NCA
- 

## 9.2 Products developed

- 2014: An antifungal and an insecticide for use in agriculture is under development, funded by TIA and company.
- 2011 – current: An eye ointment for keratino cattle have been developed for a veterinary company and is in the final stages of testing.
- 2011 – current: A range of Pheroid™-based liquid fertilizers have been developed and was be launched at the NAMPO, South Africa, 2012. The Opti –range of liquid fertilizer is now on the market in SA.
- 2007- 2010: One bioagricultural transporter product was developed and commercialized internationally with registration of the product in China, Vietnam, Namibia, Australia and New Zealand. Further registrations are in process.
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## 9.3 NRF Reviews

- (i) Mr Melusi Thwala, CSIR; Thuthuka Proposal
  - (ii) Dr Van Zyl Smit, UCT, NRF rating
  - (iii) C Tarirai, TUT, Thuthuka proposal
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## 10. PATENTS, REPORTS, PUBLICATIONS, RADIO INTERVIEWS REPORTS & PRESENTATIONS

### 10.1 Thesis and Dissertation

Grobler, AF. 2009. Pharmaceutical applications of Pheroid™ technology. PhD Thesis, North-West University, Potchefstroom, South Africa.

Grobler, AF. 1984. The *in vitro* reconstitution of PmRNP particles in a protein synthesising system. Medical School of the University of Stellenbosch, Tygerberg, South Africa.

### 10.2 Patents

Various categories of patents are shown in table format below.

#### 10.2.1 Patents granted in countries with examining offices

Patent Application/ Patent No. and Countries	Lodging Date Provisional	Granted Date	Title of Invention	Inventor(s), author(s) and defender(s)
Canada No. 2,416,650	19/07/2001	Granted 21/09/2010	Enhancement of the Action of Central and Peripheral Nervous System Agents	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Europe: New Application Lodge EP 1476195 and EP 1476171	29/10/2004	Granted 8/09/ 2010	Combining subject matter of PCT ZA01/00099 and 01/00100. Enhancement of the action of anti-infective agents and central and peripheral nervous system agents and transportation of nucleic acids substances (it excludes PCT ZA 01/00088)	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Canada No. 2,416,512	19/07/2000	Granted. 16/06/2010	Enhancement of the action of anti-infective agents (Anti- infective Patent)	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
China No. ZL01815743.2 Grant No ZL01815743.2	19/07/2000	Granted 26/08/2009	Enhancement of the action of anti-infective agents (Anti- infective Patent)	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Canada No. 2,237,306	13/11/1996	Granted 07/10/2008	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti- inflammatory Patent)	Inventor: Pitmy Int Nico Vermaak Defender: AF Grobler.

European Grant No 0866713, Application No 96939247.1-1219 (Claim priority from PCT/IB 96/01366).		Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Nico Vermaak Defender: AF Grobler.
Austria Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Pitmy Int Defender: AF Grobler.
Belgium Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Nico Vermaak Defender: AF Grobler.
France Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Germany Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Ireland Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Italy Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Netherlands Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.



Portugal Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Sweden Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Switzerland Grant No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
United Kingdom (Great Britain) Filing No 0866713 Patent No 96939247.1	13/11/1996	Granted 02/08/2006	Administration Media for the analgesic, anti-inflammatory and anti-pyretic drugs containing nitrous oxide and pharmaceutical compositions containing such media and drugs. (Anti-inflammatory Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
Canada No. 2,416,519	19/07/2001	Granted 20/09/2011	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Europe No. 01959904.2	19/07/2001	Granted 08/09/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Sweden No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Denmark No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Finland No. 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Switzerland No. 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Netherlands No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
United kingdom No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
France No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler

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Austria No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Germany No 1476171	19/07/2001	Validated 08/12/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
Europe No. 01959904.2	19/07/2001	Granted 08/09/2010	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler
European Application No. 06710759.9 Patent no 1843787	20/01/2006	Granted 02/11/2011	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Sweden Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Italy Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Germany Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Hungary Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Finland Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Denmark Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
France Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Spain Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Austria Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Switzerland Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Netherlands Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze

Belgium Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
Ireland Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze
United Kingdom Validation no 1843787	20/01/2006	Validation 02/02/2012	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze

### 10.2.2 Patents submitted in countries with examining offices; pending

Patent Application/ Patent No. and Countries	Lodging Date Provisional	Lodging date Complete	Title of Invention	Notes
Hong Kong Final No 09110361	23/02/2007	09/12/2009	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
PCT/ IB2008/052692	04/07/2008	2009	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
Japan 2010-514237	04/07/2008	2009	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
European PA No 08789190.9	04/07/2008	2009	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
USA PA No. 12/667,722	04/07/2008	2010	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
India PA no. 54/DELNP/2010	04/07/2008	2010	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
Chinese Final no 200880101395.7	04/07/2008	2010	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
Hong Kong Patent application no. 11105410.8	04/07/2008	2011	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Inventors: AF Grobler, AF Kotze, J du Plessis Author: AF Grobler
Europe Final No 07713166.2	23/02/2007	28/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler

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Hong Kong Final No 08108995.0	26/01/2006	13/08/2008	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
China Final No 2007/80014678.3	23/02/2007	26/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
Australia Final No 2007/219122	23/02/2007	26/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
New Zealand Divisional Application No. 595425	29/09/2011	28/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
Brazil Final No PI0708325-4	23/02/2007	27/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
Canada Final No 2,644,354	23/02/2007	25/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
New Zealand Final No 570799	23/02/2007	26/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
United States of America No 12/280,880	23/02/2007	27/08/2008	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
PCT IB2007/050580	27/02/2006	PCT 23/02/2007	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Author: AF Grobler
Canada Application No 2,596,920	26/01/2006	30/07/2007	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
Chinese Application No 2006/80003424-7	26/01/2006	26/07/2007	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
India Application No 4704/DELNP/2007	26/01/2006	19/06/2007	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
Japan Application No 2007/552795	26/01/2006	27/07/2007	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze

USA Application No. 11/794,503	26/01/2006	28/06/2007	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
PCT IB2006/050286	26/01/2006		Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventor: AF Grobler Authors: AF Grobler, AF Kotze
Europe: New Application Lodge EP 1476195 and EP 1476171	29/10/2004		Combining subject matter of PCT ZA 01/00099 and 01/00100. "Enhancement of the Action of Anti-infective Agents and of Central and peripheral nervous system agents" and "transportation of Nucleicacid substances". (It excludes PCT ZA 01/00088)	Inventor: Pitmy Int Author: AF Grobler
Europe No. 01959904.2	19/07/2001		Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: AF Grobler
European No 01959903.4	19/07/2001		Enhancement of the Action of Central and Peripheral Nervous System Agents	Inventor: Pitmy Int Author: AF Grobler
USA Final application 10/345,204	19/07/2000	16/01/2003	(Combining subject matter of PCT ZA01/00098.01/00099 and 01/00100) "Enhancement of the action of anti-infective agents and of central and peripheral nervous system agents and transportation of the Nucleicacid substances" (Anti-infective Patent)	Inventor: Pitmy Int Author: AF Grobler Defender: AF Grobler

### 10.2.3 Submitted & pending South African patents (2009 – current)

Patent Application/ Patent No. and Countries	Lodging Date Provisional	Inventors	Title of Invention	Status / Notes
RSA Provisional Nr. 2007/05497	05/07/2007	AF Grobler, AF Kotze, J Du Plessis	Enhancement of the Efficacy of Therapeutic Proteins (Peptide patent)	Pending PCT Application filed on 04/07/2008
RSA Provisional 2011/06492	06/09/2012	AF Grobler, O Levanets	A method for preparing biological material	A provisional South African patent Application has been filed on 06/09/2011. Patent has been allocated a specific patent no.

### 10.2.4 Patents granted in South Africa

Patent Application/ Patent No. and Countries	Lodging date Complete	Granted Date	Title of Invention	Status / Notes
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RSA Final Application No 2008/00818	28/01/2008	Granted 30/09/2009	Plant support formulation vehicle for delivery and translocation of phytologically beneficial substances and compositions containing same	Inventor: AF Grobler Authors: AF Grobler,
RSA No 2003/0364 based on PC ZA 01/00099	14/01/2003	Granted. 28/07/2004	Enhancement of the Action of Central and Peripheral Nervous System Agents	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
RSA No. 2003/0365 based on PCT ZA 01/00100	14/01/2003	Granted 28/07/2004	Transportation of Nucleic Acid Substances	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
RSA No. 2003/0366 based on PCT ZA 01/00098	19/07/2001	Granted. 12/08/2004	Enhancement of the action of anti-infective agents (Anti-infective Patent)	Inventor: Pitmy Int Author: Nico Vermaak Defender: AF Grobler.
RSA Final Application No 2006/08016	ZA2005/0856	Granted 27/09/2006	Adjuvant for the Enhancement of the Efficacy of Vaccines (Lipid and Nitrous Oxide Combination) (Vaccines)	Inventors: AF Grobler, AF Kotze.

## 10.2 Reports

- Grobler, AF. 2012. Annual Report (30 Month) TIA Project T09-00007/H/NW: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine. p. 1-32.
- Grobler, AF. 2011. Annual Report for the DST/NWU Preclinical Drug Development Platform. p. 1-48.
- Grobler, AF. 2011. Annual Report (24 Month) TIA Project T09-00007/H/NW: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine. p. 1-72.
- Grobler, AF. Technical report (18 Months) for TIA Project T09-00007/H/NW: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine. (2011)
- Grobler, AF. 2011. Interim Commercialization Report for TIA Project T09-00007/H/NW: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine. p. 1-44.
- Grobler, AF. 2011. Final report for Innovation Fund Project T60042: Optimisation of drug delivery for tuberculosis, malaria and paediatric HIV/AIDS. p 1-50.
- Grobler, AF. 2011. Commercialisation Plan for Innovation Fund Project T60042: Optimisation of drug delivery for tuberculosis, malaria and paediatric HIV/AIDS. p. 1 – 50.
- Grobler, AF. 2010. Annual Technical report (12 Months) for TIA Project T09-00007/H/NW: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine.

9. Grobler, AF. 2009. Six months report for for Innovation Fund Project T90020: An investigation into the probable reversal of drug resistance of antimalarials using Pheroid™ technology, with specific reference to chloroquine.
10. Report to Medicines Control Council on Phase 1 tuberculosis trial, using Emzaloid technology, 2002.
11. Report for Chief Director: Public Understanding of Science and Technology, 1999.
12. Report for the Minister's Office, DACST: Sci Tech Festival March, 1998.
13. Report for Directorate Science & Technology for Job Summit November, 1998.

### 10.3 Peer-reviewed scientific publications

(Please note that some my scientific publications are published under my full surname of Grobler-Rabie).

1. Grobler, L., Haynes, R., Masimirembwa, C., Thelingwani, R., Steyn, H.S., Steenkamp, P., Grobler, A. 2014. The effect of the Pheroid delivery system on the *in vitro* metabolism and *in vivo* pharmacokinetics of artemisone. Expert Opinion on Drug Metabolism & Toxicology. *In press*.
2. Nkabinde, L. A., Shoba-Zikhali, L. N. N., Semete-Makokotlela, B., Kalombo, L., Swai, H., Grobler, A., Hamman, J. H. 2014. Poly (D,L-lactide-co-glycolide) nanoparticles: Uptake by epithelial cells and cytotoxicity. *eXPRESS Polymer Letters* Vol.8, **3**: 197–206.
3. Le Roux, D., Burger, P.B., Niemand, J., Grobler, A., Urbán, P., Fernández-Busquets, X., Barker, R.H., Serrano, A.E., Louw, A.I., Lyn-Marie Birkholtz. 2014. Novel S-adenosyl-L-methionine decarboxylase inhibitors as potent antiproliferative agents against intraerythrocytic Plasmodium falciparum parasites. *International Journal for Parasitology: Drugs and Drug Resistance*. **4**: 28–36.
4. Sibanda, W, Pretorius, P. Grobler, A. 2012. Response Surface Modeling and optimization to elucidate the differential effects of demographic characteristics on HIV prevalence in South Africa. **2012 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining**. Istanbul, Turkey.
5. Aminakem M.N., Aman Mahajan, A., Kumar, V., Hans, R., Wiesner, L., Taylor, D. de Kock, C. Grobler, A. Smith, P.J. Kirschner, M., Rethwilm, A., Pradel, G., Chibale, K. 2012. Synthesis and evaluation of hybrid drugs for a potential HIV/AIDS-malaria combination therapy. **Bioorganic & Medicinal Chemistry**; **20**: 5277–5289.
6. Grobler, A., Levanets, O., Whittney, S., Booth, C., Viljoen, H. 2012. Rapid Cell Lysis and DNA Capture in a Lysis Micro Reactor. **Chemical Engineering Science**; **81**: 311–318.
7. Steyn, J.D., Wiesner, L., du Plessis, L.H., Grobler, A.F., Smith, P.J., Chan, W.C., Haynes, R.K and Kotzé, A.F. 2011. Absorption of the novel artemisinin derivatives artemisone and artemiside: Potential application of Pheroid™ technology. **International Journal of Pharmaceutics**. 414(1-2) : 260-266.

8. Fox LT, Gerber M, Du Preez JL, Grobler A, Du Plessis J. 2011. Topical and Transdermal Delivery of L-Carnitine. **Skin Pharmacology and Physiology**. 24: 330-336.
9. Jacoba E Smit, Ann F Grobler, Raymond W Sparrow. 2011. Influence of Variation in Eumelanin Content on Absorbance Spectra of Liquid Skin-like Phantoms. **Photochemistry and Photobiology**. 87: 64–71.
10. Elgar, D, Grobler, A. 2007. The use of confocal microscopy in the determination of membrane potential. **African Biotechnology Journal**, 2(3)
11. Grobler E, Grobler AF, van der Schyf, CJ and Malan, SF. 2006. Effect of polycyclic cage amines on the transmembrane potential of neuronal cells. **Bioorganic & Medicinal Chemistry**, vol.14, p. 1176-1181
12. Elgar, D, Verdonck, A, Grobler AF, Fourie, CMT & du Plessis, JL. 2006. Ion selectivity of scorpion toxin-induced pores in cardiac myocytes. **Peptides**, 27(1), p. 55-61
13. Reinecke, F, Leanevitz, A, van der Westhuizen, F, Grobler, A. 2006. Metallothionein isoform 2A expression is inducible and protects against ROS-mediated cell death in rotenone-treated HeLa cells. **Biochemical Journal** 2 (395):405-413
14. Saunders JCJ, Davis HJ, Coetzee L, Botha S, Kruger AE, Grobler A, 1999. A novel Skin Penetration Enhancer: Evaluation by membrane diffusion and confocal microscopy. **J pharm Pharmaceut Sci** 2(3): 99-107
15. Van Wyk CW, Oliveir A, de Miranda CM Van der Bijl P, Grobler-Rabie A, 1995. Observations on the effect of chilli extract on the proliferation of oral fibroblasts. **Ind J Exper Biol** 33: 244-248
16. Van Wyk CW, Oliveir A, Hoal-van Helden EG, Grobler-Rabie A. 1994. Oral and skin fibroblast growth of patients with oral submucous fibrosis. **J Oral Pathol Med** 24: 349-353
17. Van Wyk CW, Oliveir A, de Miranda CM Van der Bijl P, Grobler-Rabie A, 1994. Oral squamous cell carcinoma in SA Indians and areca nut chewing: A retrospective study. **Oral Oncology**, Vol IIIA: 12-15 (Published abstract).
18. Van Wyk CW, Grobler-Rabie A, Martell RW, Hammond MG, 1994. HLA-antigens in oral submucous fibrosis. **J Oral Pathol Med** 23: 23-27
19. Van Wyk CW, Oliveir A, de Miranda CM Van der Bijl P, Grobler-Rabie A, 1994. Observations on the effect of areca nut extracts on fibroblast proliferation. **J Oral Pathol Med** 23: 145-148.
20. Van Wyk CW, Stander, I, Padayachee, A, Grobler-Rabie A, 1993. The area Nut Chewing Habit and Oral squamous cell carcinoma in SA Indians. **SA Med J** 83: (6): 425-429.
21. Van Wyk CW, Stander, I, Padayachee, A, Grobler-Rabie A, 1992. The Areca Nut Chewing Habit and Oral Cancer. **J Dent Res** 71: 707
22. Van Wyk CW, Grobler-Rabie A, Oliveir A, Quick A, et al. 1991. Fibroblast proliferation in submucous fibrosis (SF) **J Dent Res** 70: 548
23. Ellis GC, Grobler-Rabie A, Hough FS, Bester A, 1988. Location and methylation pattern of a matrix associated region in the human pro $\alpha$ 2(I) collagen genes. **Biochem. Biophys. Res. Commun.** 157: 500-506



24. Grobler-Rabie AF, Wallis G, Brebner DK, Beighton P, et al. 1985. Detections of a high frequency Rsa I polymorphism in the human proa2 (I) Collagen gene which is linked to an autosomal dominant form of osteogenesis imperfecta. **EMBO Journal** 4: 1745-1748
25. Grobler-Rabie AF, Brebner DK, Vandenplas S, et al. 1985. Polymorphism of DNA sequence in the proa2 (1) collagen gene. **J Med Genet** 1985;22:182-6.
26. Brebner DK, Grobler-Rabie AF, Bester AJ, Mathew CG et al. 1985. Two new polymorphic markers in the human proa2 (1) collagen gene. **Hum Genet.** 07: 25-27
27. Van den Plas, S, Grobler-Rabie, A, Brebner, K, Ricketts, M et al. 1984. Blot Hybridization analysis of genomic DNA. **J Med Genet.** 21: 164-172

#### **10.4 Invited book chapters**

1. Grobler, A, F., Kotzé, A.F. and du Plessis, J. 2008. The design of a skin-friendly carrier for cosmetic compounds using Pheroid™ technology. (In Wiechers, J.W. ed. Science and Applications of Skin Delivery Systems) Allured Publishing Corporation Illinois, USA. p.283-311. (Book chapter)
2. Olliver L, Grobler-Rabie A, Boyd CD, 1996. In Vitro Translation of Messenger RNA in a Wheat Germ Extract Cell-Free System II. *Methods in Mol Biol* 58:485-489.
3. Ricketts, M, Brink P, Corfield V, Grobler-Rabie A et al. 1988. A molecular View of life processes. In: South African Medical Research, Brink AJ Ed. Owen Burgess Publishers: 313-323
4. Olivier CL, Grobler-Rabie A, Boyd CD. 1984. In vitro translation of mRNA in a wheat germ extract cell-free system. In: *Methods in Molecular Biology*, Walker, JM Ed. New Jersey: Humana Press: 137-144
5. Boyd CD, Grobler-Rabie A, 1984. "A Genetic evaluation of the mixing of races" ( 'n Genetiese evaluering van rassevemenging). In: *In the balance (Op die Skaal)*. Kinghorn, J de Villiers, DS eds.

#### **10.5 Significant conference participation**

##### **10.5.1 Invited speaker during 2012 - present**

1. DST/UK SA Biodesign meeting. February 2012; SA Embassy, London, UK.
2. Indo-South Africa Workshop on Traditional Medicine System: Sharing Knowledge and Experience; 29-21 Oct 2012, New Dehli, India
3. Pan-African Nanomedicine; 4-10 November 2012; Pretoria
4. EU Nanogold Safety; 2-4 May 2012, Muldersdrift, South Africa
5. SA/Argentine bilateral Nanotechnology meeting; 5-8 May 2012; Somerset West, South Africa.
6. Participate in the Point – of - Care Methods of Tuberculosis Workshop at the Schloss Beuggen in Basel from 19 – 20 February 2014.
7. IBSA Workshop, Johannesburg, 3-4 April 2014

### 10.5.2 International conferences over the past 5 years

1. Pharmaceutical research, post graduate training and services at the North-West University Anne Grobler, Jeanetta du Plessis, Banie Boneschans, World Congress of Basic and Clinical Pharmacology 13 – 18 July 2014
2. Satellite Workshop to the World Congress of Basic and Clinical Pharmacology 2014 12 & 13 July 2014, Stellenbosch, Organizers
3. International BIO Convention 2014, 23-26 June 2014 part of South African Pavilion
4. Necessity is the mother of invention: Developing countries taking a Proactive approach against Burden of Disease, N.I. Barnard\* and A.F. Grobler. G20 Youth Forum, Germany, 7 – 12 May 2014
5. The South African Biodesign Initiative. Grobler, AF. DST SAccess programme between South Africa and England; 23-27 January 2012 London, UK and Den Hague, Netherlands.
6. Transdermal Delivery of Local Anesthetics. Jeanetta du Plessis, Lorraine Kruger, Anne F. Grobler, Minja Gerber, Maides M. Malan and Jan L. du Preez. 38th Annual Meeting & Exposition of the Controlled Release Society, July 30 – August 3, 2011 in National Harbor, Maryland (MD), USA. (Poster)
7. The use of alternative formulation strategies to enhance the efficacy of antimalarials. Grobler, A., Du Plessis, L., Rautenbach, M., Langley, N., Steyn, D., Haynes, R., Liebenberg, W., Kotze, A. 2009. The 36<sup>th</sup> Annual Meeting & Exposition of the Controlled Release Society. July 18-22. Copenhagen, Denmark. (Podium - Invited speaker).
8. The use of the Pheroid™ drug delivery system to evaluate TB drug interactions, solubility, absorption and efflux. Grobler, A, van der Merwe, H, Niewoudt, L-M, Bester, C, Kotzé, A, Liebenberg, W. *Keystone Symposia Global Health Series*, Arusha, Tanzania, 20-25 October 2009 (Poster).
9. Chewable-dispersible tablets as dosage form for antituberculosis and antiretroviral drugs. Letsoalo, C, Labuschagne, J.W., du Preez, J.L., Grobler A. & Lötter, A.P. *Keystone Symposia Global Health Series*, Arusha, Tanzania, 20-25 October 2009 (Poster).
10. Enhanced *in vitro* delivery of abacavir and lamivudine entrapped in a Pheroid™ formulation. Van der Merwe, H, Botha, M, Grobler, A, Kotze, A, Liebenberg, W. *Keystone Symposia Global Health Series*, Arusha, Tanzania, 20-25 October 2009 (Poster).
11. The transdermal delivery of Isoniazid and Rifampicin by Pheroid™ Technology for dermal TB. Botes, A, Grobler, A, Hadgraft, J, du Preez, J, Du Plessis, J. *Keystone Symposia Global Health Series*, Arusha, Tanzania, 20-25 October 2009 (Poster).
12. Botes A, Groble, A, Hadgraft J, du Preez J, Du Plessis J. The transdermal delivery of Isoniazid and Rifampicin by PheroidT Technology for dermal TB. *Keystone Symposia Global Health Series*, Arusha, Tanzania, 20-25 October 2009. Poster.
13. Assessment of the *in vitro* efficacy of selected artemisinin derivatives in combination with the Pheroid™ drug delivery system. A. Kotze, L. du Plessis, D. Steyn, A. Grobler and R. Haynes. 6<sup>th</sup> European Congress on Tropical Medicine and International Health and 7<sup>th</sup> National Congress of the Italian Society of Travel and Migration Medicine, 6-10

- September, 2009. (Poster). European Journal of tropical medicine and international health. 14(s2):127.
14. Liquid nano-carrier systems. Grobler, A, du Plessis, L, van der Merwe, H, Niewoudt, L-M, Langley, N, Mensah, P, Kotzé, A, Liebenberg, W. IBSA NanoSchool on Advanced Health, Farm Inn, Pretoria. 25-29 November 2009. (Podium).
  15. A novel drug delivery system with wide application. Grobler, A., Liebenberg, W., Du Plessis, J., Kotzé, A.F. Pheroid™ technology: The 1<sup>st</sup> International Conference on Drug Design & Discovery. Dubai, UAE. 3-6 February 2008. (Podium).
  16. Transdermal Drug Delivery: Current status and solutions to problems. Du Plessis J, Grobler A. 1st International Conference on Drug Design & Discovery (ICDDD), Dubai, UAE, 4 - 7 February 2008. (Podium).
  17. An *in vitro* evaluation of the enhancement in efficacy of anti-malarial drugs by Pheroid™ technology. Langley, N., Grobler, A., Du Plessis, L., Kotzé, A. & Liebenberg, W. The 1<sup>st</sup> International Conference on Drug Design & Discovery. Dubai, UAE. 3-6 February 2008. (Poster).
  18. Transdermal delivery of Arginine Vasopressin with Pheroid™ technology. Coetzee H, Grobler A, Du Plessis J. 1st International Conference on Drug Design & Discovery (ICDDD), Dubai, UAE, 4 - 7 February 2008. (Poster).
  19. Botes A, Grobler A, Hadgraft J, Du Plessis J. The transdermal delivery of Isoniazid and Rifampicin by Pheroid™ Technology for dermal TB. Keystone Symposia - Pathogenesis and Control of Emerging Infections and Drug-Resistant Organisms, Global Health Series, Bangkok, Thailand, 22 - 27 October 2008. (Poster).
  20. The development of a more effective antituberculosis drug formulation. Grobler, A., Kotzé, A., Matthee, L., Nieuwoudt, L & Liebenberg, W. Symposium Translating New Technologies to Improve Public Health in Africa, Keystone Symposium Global Health Series. Kampala, Uganda. 15-20 May 2008. (Poster).
  21. Oral and Nasal Delivery of Three Model Peptide Drugs in an Animal Model Using Pheroid™ Technology. Grobler, A.; Lubbe, J.; Oberholzer, I.; Steyn, D.; Liebenberg, W.; Kotzé, A. The 21th Annual Meeting of the American Association of Pharmaceutical Scientists, San Diego, California, USA. 11-15 November 2007. (Poster).
  22. Characterization and evaluation of Pheroid: A novel fatty acid based adjuvant. P Mensah, N Ravenscroft, A Grobler, AF Kotzé. Keystone Symposia Conference: T1: Challenges of Global Vaccine Development. Cape Town, South Africa. 2007. (Poster).
  23. Peptide drug delivery with Pheroid technology. The 34<sup>th</sup> Annual Meeting and Exposition of the Controlled Release Society. Long Beach, CA, USA. Proceed. Int. Symp. Control. Rel. Bioact. Mater. TRANSACTIONS 2007 (225). 2007. (Poster).
  24. Increased bioavailability and *in vitro* efficacy of anti-tuberculosis drugs by the Pheroid™ delivery system. AF Grobler, AF Kotzé, I Wiid & W Liebenberg, AAPS Annual meeting and Exposition, San Antonio, USA. 2006. (Poster).
  25. The enhancement of the efficacy of HIV vaccines and AIDS therapies by Pheroid technology. Grobler, A.F., Kotzé, A.F. World Aids Day – China, Tianjin, PRC. 2006 (Podium).
  26. Emzalooids as Delivery Vehicles for the Transdermal Delivery of Selected Drugs. Du Plessis, J.; Killian, D.; Reynecke, S. and Grobler, A.F. Controlled Release Society, 32nd Annual Meeting & Exposition. Miami Beach, Florida. 18-22 June 2005 (Poster).

27. Chitosan and Chitosan derivatives as Non-viral Gene Transfection Agents. Venter, C, Grobler, AF, Pretorius, PJ, and Kotze, AF. 2005. Controlled Release Society, 32nd Annual Meeting & Exposition. Miami Beach, Florida. 18-22 June 2005 (Poster).

The author participated in 11 international conferences and symposia before 2005.

### 10.5.2 Presentations at local conferences over the past 5 years

Participation at local conferences and symposia from 2006 to the present is listed below. The author participated in 46 additional local conferences and symposia before 2005.

1. Tenofovir plasma concentration is a strong predictor of albuminuria in HIV-1-infected women. Mwila Mulubwa<sup>1</sup>, Malie Rheeders<sup>1</sup>, Carla Fourie<sup>2</sup>, I.M Kruger<sup>3</sup>, Linzie Du Plessis<sup>4</sup>, Anne Grobler<sup>4</sup>, Michelle Viljoen<sup>1</sup>
2. Clinton Rambanapasi<sup>1\*</sup>, Nicola Barnard<sup>1</sup>, Molahlehi Sonopo<sup>2</sup>, Hylton Buntting<sup>1</sup>, Anine Jordaan<sup>3</sup>, Hendrik S. Steyn<sup>4</sup> Jan Rijn Zeevaart<sup>1, 2</sup>, Anne F. Grobler<sup>1</sup> Acute Toxicity and Biodistribution of 14nm Gold Nanoparticles, WCP 13 – 18 July 2014, CTICC, Cape Town
3. Madichaba P Chelopo<sup>1,2\*</sup>, Lonji Kalombo<sup>1</sup>, Matthew Glyn<sup>2</sup>, Brendon Naicker<sup>1</sup>, Hulda Swai<sup>1</sup>, Anne Grobler<sup>2</sup>, Rose Hayeshi<sup>1</sup> Physicochemical and In Vivo Characteristics of a Combined Drug Delivery System for Selected Anti-Tuberculosis Drugs
4. Ndong Cheng<sup>1</sup>, Anne F Grobler<sup>1</sup>, Daniel A Boakye<sup>4</sup>, Wilfred F Mbacham<sup>2,3</sup> Trends in Malaria and Malaria Associated disease prevalence and treatment following changes in Malaria treatment Policy in the Mbakong Health Area of the North Region of Cameroon. 6th MIM Pan African Malaria Conference, 6 – 11 October 2014, ICC Durban
5. Isaac Mutingwende, Pamela Gumbi, Anne Grobler, Urban Vermuelen, Hendrik Viljoen “Single step DNA diagnostics as a routine tool for MTB diagnosis” paper presented at the 2nd International Micromed workshop, 11 – 13 September 2013, Kwa Maritane, South Africa
6. Desiree Wilken<sup>1</sup>, Carlos Bezuidenhout<sup>2</sup> and Anne Grobler<sup>1</sup>: Pheroid® technology: applications in therapeutics against Staphylococcus aureus and the potential it holds for the animal health sector PCP / AHEAD conference in Hwange, Dete, Zimbabwe which will be held from 11th – 15th May 2014.
7. The use of propolis as natural preservatives in cosmetics. Lizelle Fox, Berenice Campbell, Liezl-Marié Nieuwoudt, Anne Grobler and Jeanetta du Plessis. Society of Cosmetic Scientists: Formulating for Africa, Volkswagen Centre, Midrand. 1 - 3 September 2009. (Podium - Invited speaker).
8. Gerber, M., Campbell, B., Van Niekerk, L., Grobler, A.F., Du Plessis, L.H., Du Plessis, J. Topical and/or transdermal growth factors in cosmetics. 5<sup>th</sup> International Conference on Pharmaceutical and Pharmacological Sciences (ICPPS), North-West University, Potchefstroom South Africa, September 2009.
9. The use of Pheroid™ to enhance the efficacy of anti-infective agents. Grobler, A., van der Merwe, H., Nieuwoudt, L., Bester, C., Haynes, R., Steyn, D., Kotze, A., Liebenberg, W. The 5<sup>th</sup> International Conference of Pharmaceutical, Pharmacological Sciences of South Africa, Potchefstroom. South Africa. 14-17 September 2009. (Podium).
10. Pheroid™ technology enhances bioavailability of antituberculosis drugs in mice. L. Nieuwoudt, Anne Grobler, Wilna Liebenberg, Awie Kotze The 5<sup>th</sup> International

- Conference of Pharmaceutical, Pharmacological Sciences of South Africa, Potchefstroom. South Africa. 14-17 September 2009. (Poster).
11. Topical and/or transdermal growth factors in cosmetics. Gerber, M., Campbell, B., van Niekerk, L., Grobler, A., du Plessis, L., du Plessis, J. The 5<sup>th</sup> International Conference of Pharmaceutical, Pharmacological Sciences of South Africa, Potchefstroom. South Africa. 14-17 September 2009. (Poster).
  12. HPLC method development for the Pheroid™ delivery system. Van den Berg, E, Liebenberg, W, Wessels, A., Grobler, A. The 5<sup>th</sup> International Conference of Pharmaceutical, Pharmacological Sciences of South Africa, Potchefstroom. South Africa. 14-17 September 2009. (Poster).
  13. Investigating the effect of Pheroid™ on MTT viability assay. Van der Merwe, H, Grobler, A, Liebenberg, W, Kotze, A. The 5<sup>th</sup> International Conference of Pharmaceutical, Pharmacological Sciences of South Africa, Potchefstroom. South Africa. 14-17 September 2009. (Poster).
  14. Kuhn, A., Van der merwe, H., Grobler, A., Kotzé, A. & Liebenberg, W. A 30 day stability study on stavudine in solution in a commercially available ARV product. The 28<sup>th</sup> annual Conference of the Academy of Pharmaceutical Sciences of South Africa, Club Mykonos resort, Langebaan, Western Cape. 2007. (Poster).
  15. Langley, N., Grobler, A., Du Plessis, L. & Kotzé, A. 2007. Preclinical evaluation of the possible enhancement of the efficacy of anti-malaria drugs by Pheroid technology™. The 28<sup>th</sup> annual Conference of the Academy of Pharmaceutical Sciences of South Africa, Club Mykonos resort, Langebaan, Western Cape. 2007. (Podium).
  16. Matthee, L., Grobler, A., Liebenberg, W., Nieuwoudt, L., Steyn, D. & Kotzé, A. Pilot study to determine blood plasma levels of an antituberculosis pro-pheroid formula in CD57 inbred mice and the determination of drug content after 7 weeks. The 28<sup>th</sup> annual Conference of the Academy of Pharmaceutical Sciences of South Africa, Club Mykonos resort, Langebaan, Western Cape. 2007. (Poster).
  17. The use of an essential fatty acid-based delivery system in cosmetic formulations. A.F. Grobler, J. du Plessis and D van Mollendorf. Society of Cosmetic Scientists: Formulating for Africa, Volkswagen Centre, Midrand. 13 -15 September, 2006. (Podium – Invited speaker).
  18. Peroral and nasal delivery of insulin with Pheroid technology. ID Oberholzer, AF Kotzé, AF Grobler. The 4<sup>th</sup> International Conference of Pharmaceutical and Pharmacological Sciences (ICPPS). 2006. Vanderbijlpark, South Africa. (Poster).
  19. Pheroid technology: an introduction. Anne Grobler, Awie Kotze, Jeanetta du Plessis. 4th Bio2Biz Conference, International Conference Centre, Durban. 26-29 September 2006. (Podium).
  20. Pheroid technology and infectious diseases. Anne Grobler, Dale Elgar, Awie Kotze. 4th Bio2Biz Conference, International Conference Centre, Durban. 26-29 September 2006 (Podium).
  21. The use of Pheroid technology in Vaccines. Anne Grobler, Awie Kotze. 4th Bio2Biz Conference International Conference Centre, Durban. , 26-29 September 2006. (Podium).

22. The use of Pheroid technology in plants. Anne Grobler, Sheckles Trading 11, Elementol (Pty) Ltd. 4th Bio2Biz Conference, International Conference Centre, Durban. 26-29 September 2006.(Podium).

## **10.6 Radio Interviews**

### **Confocal Microscopy**

Voice of the Cape 29 April 1998  
Voice of the Cape 13 May 1998  
Punt Radio 24 June 1998  
Radio Matie 24 February 1998

### **Science and Technology**

Radio Atlantis, 23.02/1998  
Radio Matie, 24/02/1998  
Cape Community Radio, 25/02/1998  
Bush Radio, 4/03/1998  
Helderberg Radio, 5/03/1998  
Fine Music Radio, 5/03/1998  
Tygerberg Radio, 6/03/1998  
Vioce of the Cape, 6/03/1998  
Radio Good Hope, 6/03/1998  
KFM Radio, 7/03/1998  
Punt Radio, 10/03/1998  
KFM Radio, 10/03/1998  
KFM Radio, 11/03/1998  
Cape at six, 13/03/1998

## **10.7 Lay publications and newspaper articles**

1. Grobler A, Gething L & Toma I. 1997. Who needs me? Career poster.
2. Gething L, Maharaj R & Grobler A. Careers in medical research and public health.
3. Grobler A. Science is Cool – Scientech. Foundation for Research Development eds.
4. Grobler A. & Wolfe-Coote S.A. 1998 Analytical Reporter Vol. 1. Confocal Microscopy
5. Grobler A. 1998 Analytical Reporter Vol. 2. Confocal Microscopy
6. Grobler A. Wolfe-Coote S.A 1998 Analytical Reporter Vol. 3. Confocal Microscopy
7. Grobler A. 1998 SASBMB 2 (2): Confocal Microscopy as research tool
8. Die Burger 25 June 1998. Confocal Microscopy & Old Mutual
9. The Argus 25 June 1998. Confocal Microscopy & Old Mutual
10. The Star and the Cape Times, March 1999
11. Argus/BP Career Chart for National Distribution, March 1998
12. 13. Cape Times: Say cool to science and Technology, 10.02/1998
13. Die Burger: Science Quiz. 20/02/1998
14. Die Burger: Science Quiz, 21/02/1998
15. Die Burger: Science Quiz, 23/02/1998
16. Die Burger: Science Quiz, 24/02/1998
17. Die Burger: Science Quiz, 25/02/1998

18. Die Burger: Science Quiz, 26/02/1998
19. Die Burger: Science Quiz, 27/02/1998
20. Argus Supplement: Science and Tech in Western Cape, 5/03/1998
21. The Cape Times: Techno Times, 17/03/1998

## 10.8 Exhibitions

### BIO2BIZ

2006. Pheroid™ applications. KwaZulu-Natal, Durban ICC.  
2007. Pheroid™ applications. Cape Town ICC.

### Confocal Microscopy:

- SciTech Festival, Western Cape: March 1998  
Focus Week, Eastern Cape  
Focus Week, KwaZulu-Natal  
Focus Week, Northern Cape

### Science and Technology:

- SciTech Festival, Western Cape: March 1998  
Parliamentary Exhibition For Dept of Arts, Culture, Science and Technology, April 1998  
Technology in Schools, Northern Suburbs, June 1998  
Women in Science, Engineering and Technology, August 1998  
Technology in Schools, Gugulethu, August 1998  
Good Hope Centre Career Exhibition, August 1998

## 11. ACADEMIC AWARDS AND ACHIEVEMENTS

- 1983 MSc Cum Laude  
1983 MRC Research Fellowship 1982  
1988 SA Biochemical Society Award for best National Presentation at Xth Biochemical Conference  
1998 Tender allocation and award for Project Management of Year of Science & Technology for Western Cape for Dept of Arts, Culture, Science and Technology  
2000 Speaker at Business Park, University of Penn, Philadelphia, USA; Novel Drug Delivery Technologies.  
2002 Invited speaker at Biochimie, Austria on Technology Advancement in Drug Delivery Systems.  
2003 Convener of Vaccine Initiative between the BIOVAC Institute, MeyerZall Laboratories, the Universities of Gent, Cape Town, Pretoria and Potchefstroom and the Port Elizabeth Technikon.  
2009 Runner-up: Emory University / DST Bioplan competition  
2009 Obtain DST-IF (Bilateral) funding for Project T90020 of R 4 307 583 for 2009 – 2011 in “An investigation into the possible reversal of drug resistance of antimalarials by

- Pheroid™ technology, with specific reference to chloroquine”. Appointed as project manager.
- 2009 Invited speaker and chair at the CRS conference in Kopenhagen: Mini-symposium on malaria.
- 2010 Vice-Chancellor’s Honorary Award for “Enhancement of the action of anti-infective agents” forming the subject of international patent.
- 2010 Vice-Chancellor’s Honorary Award for “Enhancement of the action of anti-inflammatory agents” forming the subject of international patent.
- 2010 Winner of Swiss Biotechnology Innovation Competition – Participant in Innovation Management School, Switzerland.
- 2010 Selection of NWU to establish the DST Preclinical Drug Development Platform.
- 2012 Technology Innovation Agency award to establish molecular diagnostics for tuberculosis.
- 2014 NSTF- BHP Billiton Award 2013/14

## **12. HUMAN CAPITAL DEVELOPMENT & JOB CREATION**

- 1999 8 Honours students from Med School, University of Stellenbosch
- 1998 29 Honours students from University of Western Cape and from Medical School University of Stellenbosch were trained in fluorescence microscopy
- 1998: People were employed temporarily during 1998 for the Year of Science and:  
Technology as follows:
- Admin staff 2
  - Security guards 18
  - Marshalls 52
- 1997 21 Honours students from University of Western Cape and from Medical School University of Stellenbosch were trained in fluorescence microscopy
- 2000-2004 3 ungraduated people employed as research assistants
- 2005-current Postgraduate students as described under training above