

Eden Padayachee

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Re: Partnership in Alzheimer's research

Dear: Professor

My name is Eden Padayachee, a medicinal biochemist with expertise in proteomics and biophysics, enzymology and structural biology. It has always been my dream and strongest desire to pursue a career in neuroscience, specializing in Alzheimer's research and to help create a knowledge hub to facilitate innovative research into the understanding of the brain. Involvement in an 'Alzheimer' research group such as that headed by you is just what I require to enhance my current expertise and is an ideal niche for me to expand and develop new techniques and learn about cutting-edge technology to gain clarity on the mechanisms of the brain in neurodegeneration and Alzheimer's. My PhD research revolved around designing novel inhibitors to inhibit amyloid peptide aggregation, targeting enzyme biomarkers and incorporating the use of nanotechnology to slow down the progression of the disease.

I have experience in thermodynamics, fluorescence quenching, FRET, computer simulations and docking and imaging to study enzyme-peptide interactions. I am a quick learner and grasp concepts easily and apply research principles to a research problem, always looking beyond conventional scientific protocol into novel methods of experimental design. I enjoy working independently and possess an attitude of excellence in research, always striving for simple, workable solutions to challenges. I have a strong desire to join your research team as a neuroscientist, as I have a deep fascination with understanding the brain and a deep passion for Alzheimer's disease research as together with my MSc and PhD combined, I possess over 5 years of experience in the field of Alzheimer's disease. My current postdoctoral project initiated the novel discovery of endogenous high density lipoproteins (HDL) which behave as a "disaggregating agent" in Alzheimer's disease and offers a new paradigm for drug discovery in the field of neurodegeneration. My goal is to commercialize an idea and see its transformation into an eventual drug that can cure Alzheimer's disease and other health care problems globally.

I look forward to hearing from you.

Yours Sincerely
Dr. Eden Padayachee
PhD Medicinal Biochemistry.

Eden Padayachee (Ph.D. Medicinal Biochemistry)

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“Creativity is more important than knowledge”

(Albert Einstein)

Personal Motto: “To dream, discover and explore.”

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Citizenship: South African



Expertise: Biochemical mechanisms of Alzheimers disease.

Professional Profile

Objective: Eagerly seeking a position as a post-doctorate in Alzheimer’s research

I am a **visionary neuroscientist** who foresees myself at the forefront of making significant breakthroughs in neuroscience. My passion lies in understanding the brain and its mechanisms through the use of biochemical research techniques. The intriguing pathways of the brain and its relation to human cognitive and psychological functions have always fascinated me. I consider myself **a pioneer in the field of neurodegenerative diseases, specializing in the field of Alzheimer’s disease research and enzyme binding and inhibition mechanisms.** My adventurous and enquiring mind set is my strongest, most valuable tool in this complex, challenging and yet exciting field, and the solutions I find aim to be simple and sustainable. I am awaiting examiners corrections regarding my **PhD in Medicinal Biochemistry on “the mechanisms of Alzheimer’s disease** by May/June 2013. My research study involved designing novel inhibitors to reduce amyloid peptide aggregation and neurofibrillary tangles-hallmarks of Alzheimer’s disease and investigating possible drug targets/biomarkers for the disease. I have a deep fascination with the understanding the mechanisms of the brain and neuronal circuitry. **A win-win situation can only exist between you and I. I possess a fiery passion to understanding the brain and enjoy the challenge of using my scientific and mathematical aptitude to find solutions to complex problems. I will be an asset to your research team by contributing my expertise and at the same time, use the knowledge and skills I gain from your research team to reach my full potential as a neuroscientist.** I strongly believe that my qualifications, research skills and strong analytical ability coupled with my natural passion for brain function and neurodegenerative research, places me in a favourable position within your dynamic team. **What sets me apart from other graduates is that I am lateral thinker, I aim to finish what I start, and possess an attitude for excellence and a strong determination to succeed against all odds.** I am a 2012 SfN-IBRO travel awardee and **considered one of the best and brightest young neuroscientists from around the world** and have recently attained international exposure at the 42nd neuroscience conference in New Orleans, United States of America. **enjoy driving innovation, teamwork and entrepreneurship and possess strong communication skills as I particularly enjoy interacting with people.** My strong analytical reasoning, critical thinking skills and problem solving skills that I developed from my PhD and previous post-doctoral, allows me to **troubleshoot problems systematically** and to make a logical story out of complex relationships between technology (software/instrumentation) and applications (reagents/biology/chemistry).

Objective

I am currently seeking a position as a scientist within your laboratory. I can add impact to your organization through innovation and creativity in research and you will provide me the platform to advance my techniques in the field of neuroscience.

Areas of Expertise

Protein aggregation, Proteomics

Biological Thermodynamics	Spectrofluorimetry
Enzyme Kinetics	Surface Plasmon Resonance (SPR)
Spectroscopy	FRET
Mechanisms of Alzheimer's disease	Computational Simulation
Immunochemistry (Western Blot)	Fluorescence Quenching

Career Summary

2015 **INSTITUTE OF NEUROCHEMISTRY AND PHYSIOLOGY, MÖLNDAL, SWEDEN**
Postdoctoral Fellow

- Involved in identifying and validating novel biomarkers for AD. Using HPLC purification and Thioflavin-T assays to purify proteins in CSF and study the retardation of fibrils by these lipoproteins. Lipid biology and mechanisms.
Techniques: Immunochemistry, ELISA, Western blot, Thioflavin-T assays, HPLC, Immunoprecipitation.
- INNOVATOR AND TEAM MEMBER AT BIOMED X BOOT-CAMP: Tau-mediated neurodegeneration in AD, Heidelberg Area, Germany**
 - Engaged in rigorous and intensive brain-storming of ideas within a team work environment.
 - Networking with top scientists from AbbVie and BioMed X to bridge the gap between industry, entrepreneurship and academia.
 - Presented an outstanding project proposal on micro-RNA as a form of therapy for Tau neurodegeneration, in front of an expert panel of judges from AbbVie.

2006 – 2013 RHODES UNIVERSITY, GRAHAMSTOWN, SOUTH AFRICA

Researcher

- Assisting in postdoctoral supervision of Honours' students in neurodegenerative research and in scientific methodology, protocol and experimental design using superoxide dismutase and COMT enzymes as therapeutic biomarkers in Alzheimer's and Parkinson's diseases
- Attending national and international conferences, participating in the communication, debate and presentation of research and addressing scientific issues on a global platform
- Writing research proposals and proposals for independent project funding and receiving scholarships and bursaries for the facilitation of research

**2006 - 2011 Secretary, Kimberley Hall Residence Committee
Sub-Warden, Thomas Pringle Residence
Biochemistry and Chemistry Tutor and Practical Demonstrator**

- Attending leadership courses
- Supervising 70 female students and managing disciplinary and administration issues
- Resolving conflict and maintaining order within the residence system
- Teaching chemistry, delivering laboratory demonstrations and motivating students

Education and Qualifications

PhD	Medicinal Biochemistry, Rhodes University, Grahamstown, South Africa, 2012
MSc	Medicinal Biochemistry, Rhodes University, Grahamstown, South Africa 2009
BSc Hons	Chemistry, Rhodes University, Grahamstown, South Africa 2007

Biochemical Techniques

- Biochemical techniques
- Proteomics
- Liquid chromatography systems.
- Biomarkers
- Biological thermodynamics and cell mechanisms
- Enzyme-Ligand Binding mechanisms
- Nanotechnology/Nano-vectors
- Computational Modelling: Designing and screening of enzyme inhibitors using molecular modelling software such as AutoDock, NAMD and FRED.
- Spectrofluorimetry/Spectroscopy
- Protein Purification: Gel filtration chromatography, Ion Exchange chromatography
- Enzyme Inhibition studies
- Fluorescence quenching and FRET (Fluorescence Energy Transfer)
- Single Molecule Array (SiMoA technology-Digital Elisa)
- Surface plasmon Resonance (SPR).
- Mass spectrometry

Awards and Achievements

- Selected as Guest Speaker at the Alzheimer's International offices, Great Suffolk street, London, 2014
- Selected as Guest Speaker at the Woman's International Club, Gothenburg, Sweden, 2014
- International Brain Research Organization travel grant awardee, 2012

- Nominated to join International Scholar Laureate Programme (ISLP) delegation of medicine in Australia or China based on exemplary academic performance, 2012
- Sasol Science Scholarship and Medical Research Council Bursary, 2007
- Dean's list for Academic Merit, Rhodes University, 2005
- Rhodes University Centenary Science Scholarship, 2004 - 2006
- Selected Member of Golden Key Society

Publications

- **Padayachee, E.**, Zetterberg H., Portelius E., Borén J., Molinuevo J.L., Andreasen, N., Cukalevski R., Linse S., Blennow K., Andreasson U. Cerebrospinal fluid-induced retardation of amyloid β aggregation correlates with Alzheimer's disease and the APOE ϵ 4 allele, Submitted to *Neuron*, 2015
- **Padayachee, E.R** and Whiteley C.G. Interaction of glycine zipper fragments of amyloid- β peptides with neuronal nitric oxide synthase: a molecular docking approach. Submitted to *Journal of Alzheimer's*, 2015
- **Padayachee, E.R**, Arowolo A. and Whiteley C.G. Nanomedicine: Action of Metal Nanoparticles on Neuronal Nitric Oxide Synthase - Fluorimetric Analysis on The Mechanism of Fibrillogenesis, *Neurochemical Research*, **39**:194 - 201, 2014
- **Padayachee, E.** and Whiteley C.G. Interaction of Glycine Zipper Fragments of A β -Peptides With Neuronal Nitric Oxide Synthase: Kinetic, Thermodynamic and Spectrofluorimetric Analysis, *Neuropeptides*, **47**:171 - 178, 2013
- **Padayachee E.** and Whiteley C.G. Etiology of Alzheimers Disease: Kinetic, Thermodynamic and Fluorimetric Analyses Of Interactions Of Pseudo A β -Peptides With Neuronal Nitric Oxide Synthase, *Neuropeptides*, **47**:321-327, 2013
- **Padayachee E.**, Ngqwala N. and Whiteley C. Association of β -amyloid Peptide Fragments With Neuronal Nitric Oxide Synthase: Implications in the Etiology of Alzheimer's disease, Department of Biochemistry, Microbiology and Biotechnology, Rhodes University, Grahamstown, South Africa; *Journal of Enzyme Inhibition and Medicinal Chemistry*, **27**:356-64, 2012
- **Padayachee E.** and Whiteley C. Spectrofluorimetric Analysis of the Interaction of Amyloid Peptides with Neuronal Nitric Oxide Synthase: Implications in Alzheimer's Disease, Department of Biochemistry, Microbiology and Biotechnology, Rhodes University, Grahamstown, South Africa, *Biochimica et Biophysica.Acta* **1810**,1136-1140, 2011

International Conferences and Professional Development

- Alzheimer's Association International Conference, Copenhagen, Denmark, 2014
- Poster title: The Novel Effect of CSF And APOE4 on The Aggregation Kinetics of A β 42 in Alzheimer's Disease
- Society for Neuroscience, 42nd Annual Meeting, New Orleans, United States of America, 2012
- Poster title: 'Neuronal Nitric Oxide Synthase and Interaction With Beta-Amyloid Peptides as a Biomarker For Alzheimer's Disease'
- South China University of Technology (SCUT) in Guangzhou Province, China, 2010
- Involved in 'Insilco screening' using protein docking software, Discovery Studio and Autodock to elucidate the binding mechanism of both amyloid and enzyme
- First South African candidate selected to attend the International Society of Neurochemistry/Asian - Pacific Society of Neurochemistry (ISN/APS) School at the Centre of Neuroscience, Faculty of Science, Mahidol University, Bangkok, Thailand, 2010
- First South African candidate selected to attend the Asian - Pacific Society of Neurochemistry (APS) Conference, Phuket, Thailand, 2010

IT Skills

Microsoft Office: Word, Excel, PowerPoint, Access

Molecular Modelling: AutoDock, NAMD, FRET, Swiss-PDB viewer

REFERENCES

1. Professor Henrik Zetterberg
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Medicinal Biochemistry

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Summary

- **Teaching & Supervision:** Involved in teaching 40 undergraduate students in biochemistry and co-supervised 2 biochemistry honours students in the field of medicinal biochemistry from 2008-2012. Resulted in an 80 % pass rate and successful completion of biochemistry projects within the department. Supervised 70 female students and managed disciplinary and administration issues and nominated as position of subwarden for 2 years due to management excellence and social awareness.
- **Research:** Internationally recognized medicinal biochemist with over 6 years of experience in Alzheimer's research, with 2 years of editorial experience in 3 high impact journals. Published research in 5 high-impact papers in top peer-reviewed journals since 2010. 2 years of editorial experience in 3 high impact journals. Received numerous bursaries, scholarships and funding initiatives over R 500 000 from 2004-2012. As a postdoctoral fellow, I was able to secure 6000 SEK in travel funds and additional 576 000 SEK in postdoctoral funding from the European Medical Information Framework (EMIF) relating to Alzheimer's research.
- **Problem-solving skills:** Utilized my strong analytical thinking and attention to detail in detecting the problem in scientific experiments and finding the right solution by trouble-shooting and finding the best solution through persistence. Lead the designing, advertising and packaging of pool-testing kits within a chemistry team project and developed knowledge in statistical and marketing models. Able to find meaning in a mountain of data. Developed new therapeutic strategies in the diagnosis of Alzheimer's disease by investigating the potential of the enzyme; nitric oxide synthase as a biomarker for the disease.
- **Leadership abilities:** Perform administrative functions related to teaching and research projects, manage funding for research, monitored operational expenses within a laboratory setting. Saved the biochemistry department over R 5000 in enzyme testing kits and secured project funding in 2010. Organized and facilitate meetings and workshops. Influential leader and speaker in at 5 international global conferences and

used high analytical techniques, contributing to innovation and the novel application of neuronal nitric oxide synthase as an enzyme biomarker in Alzheimer's disease

Education

- Ph.D. in Medicinal Biochemistry – Rhodes University
 - Commented on “methodological expertise and tenacity, this work will have a high impact in the medical field.” January, 2010 - December, 2012
- M.Sc. in Medicinal Biochemistry – Rhodes University (65%)
 - January, 2008- December, 2010
- BScH in Chemistry - Rhodes University (60 %)
 - January, 2007- December, 2007
- BSc in Chemistry and Biochemistry (70%)
 - Dean's list of academic merit, January, 2004- December, 2006
 - Recipient of Rhodes Centenary scholarship for top science learners (2004-2006)
 - Recipient of National Research Foundation bursary, Medical research council and Sasol science scholarship (2007-2012).

Experience

Post-doctorate Fellow, Sweden

January, 2014 – November, 2015

- Secured a 2-year fellowship in European Medical Information Framework (EMIF) relating to Alzheimer's research.
- Identified and validated a novel lipid-based biomarker in cerebrospinal fluid from clinical studies, resulting in the discovery of novel high density lipoproteins in association with APOE4 allele retarding A β aggregation.
- Using a new digital ELISA technology (Simoa HD-1 analyzer) that is more than 100 times more sensitive than conventional methods, examined if proteins or enzymes have potential as biomarkers.

Medicinal Biochemist, Rhodes University

May, 2010 – December 2013

- Team-player with a passion for communicating science to 20 + team members in medicinal biochemistry and analytical techniques. Resulted in over 5 scientific papers published in the enzymology field.

- Organized, supervised and mentored 2 undergraduate students in analytical HPLC, NMR, fluorescent and spectroscopic enzyme based technologies with an 80 % pass rate achieved by both students.
- Applied my scientific knowledge and expertise in providing solutions to practical questions arising on a daily basis as well as contributed to innovation projects leading to new products such as novel catalytic mechanisms and medical biomarkers in AD.
- Always maintained a customer focused approach when addressing scientific questions from professionals and public at oral and group presentations, catalyzing the flow of new ideas and action plans in enzyme biomarker research.
- Excellent writing and communication skills, invited as guest speaker at Alzheimer's association, UK and International woman's society Gothenburg.

Affiliations

- Selected from numerous candidates to participate in the "Woman in Business Technology" at the McKinsey & Company event in Spain, Barcelona, 2015.
- Influential Speaker at Alzheimer's Association and International Women's Association, Sweden, Gothenburg, 2014
- Innovator, entrepreneur and team member at the Biomed X Boot-Camp: Tau-mediated neurodegeneration in AD, Heidelberg Area, Germany, 2015
- Nominated to join International Scholar Laureate Programme (ISLP) delegation of medicine in Australia or China based on exemplary academic performance, 2012