

Anneke Derrick

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Nationality: Dutch

Research Interests

Tailor this section to the post to which you are applying, whilst staying true to your personal goals. Eg:

My ambition is to lead a research group that will use multi dimensional NMR, mass spectrometry and other synergistic techniques to study interactions between proteins and other macromolecules. Research targets will be those of outstanding biological interest, particularly those which add to the understanding of systems studied within Metalloprotein Spectroscopy and Biology, the School of Chemistry and Pharmacy and beyond.

Professional & Research Experience

2004-present: **Cambridge University Chemical Laboratory**

- BBSRC Post Doc in the mass spectrometry (MS) group of Prof. R Biochemist. Using MS I have discovered variation in the stoichiometry of a sub-complex of ribosomes and determined the A₁ stoichiometry of ATP synthase. See appendix 1 for a review of my scientific career and appendix 2 for a full list of publications.

1998-2003 **MRC-LMB, Cambridge**

- MRC Training Fellowship in the protein NMR group of Dr Mol Biologist. I determined the NMR structure of a DNA binding zinc finger protein (with Dr A Chemist), and contributed to that of the ATPase inhibitor (with Dr B Biochemist).

1997-1998 **University of Glasgow**

- Sir Henry Wellcome Commemorative Award. Postdoctoral position with Prof B P Chemistry and Prof Nat History, I initiated a study on tropical frog nest foam proteins. My work forms a foundation for current research in those groups.

Education

Include major achievements such as awards and distinctions but keep detail to a minimum for degree and pre-degree qualifications. Eg:

1992-1996 **University of East Anglia**

- PhD Wellcome Trust Prize Studentship with Prof Bio Chemist and Prof Applied Chemist. I determined the solution structure of a bacterial toxin inhibitor protein and studied its interaction with a non-cognate bacterial toxin.

1987-1992 **University of Leiden, The Netherlands**

- Dutch degree (equivalent to MSc) in chemistry with biochemistry. Exchange student at the University of East Anglia for the last academic year.

1981-1987 **St. Maartens College, Haren (Groningen), The Netherlands**

- "VWO" (Dutch equivalent to A-levels; preparation for university). Eight subjects (seven is the norm).

This example has been based upon a real CV, but some information has been changed/included. It appears here by kind permission of the researcher who generously provided the source material.

Summary of Key Research Techniques

- Non covalent electrospray mass spectrometry
- Heteronuclear Nuclear Magnetic Resonance spectroscopy of proteins
- Expertise in molecular biology and protein purification
- Experience in manipulating membrane protein and protein:DNA complexes

Successful Fundraising

- 2007: Secured funding for an administrator for a regional network in science, engineering and technology for a year.
- 2006: Secured £1000 from AAAS for the regional network in science, engineering and technology.
- 2005: Contributed to BBSRC grant funding application *Applications of mass spectrometry to study ribosome structure and function* for which I am a named Post Doc.
- 1999: Awarded MRC Training Fellowship.
- 1998: Secured a year's extension to the Sir Henry Wellcome Commemorative Award.
- 1995: Contributed to an application which secured a year's extension to my Wellcome Trust Prize Studentship.

Recent International Conferences

- Lecture: "Flight of the Ribosomes", Independent Fellowships Conference, John Innes Centre, Norwich, June 2006.
- Lecture: "Mass Spectrometry of Entire Ribosomes- Focus on the Stalk Complex", Mechanism and Control of Post-transcriptional Gene Expression Meeting, New York, May 2005.

Administrative Responsibilities

- As the person responsible for managing laboratory consumables for our current research group, I ensure that stock is ordered on time and within a budget of £ 25 000.
- I am familiar with contributing to policies and strategies and have led teams of up to six people on different projects as a steering group member for the Cambridge Association for Women in Science and Engineering and as a Governor at Crooncamp County Primary School.
- Organised and chaired meetings of up to 15 academic and research staff working on colicins during my PhD

Teaching / Lecturing Experience

- Gave tutorials on *Physical Chemistry for Biologists* and demonstrator for Biochemistry and Computing practicals during my PhD. Have given many lectures inside and outside academia on careers as a scientist.

Training & Development

- Attended courses on Communication Skills, Presentation Skills for Conferences, Writing Project Proposals, Writing Scientific Papers, Mentor Training, Supervising PhD students during 2007-8.

References

Provide full contact details of current line manager/research group (ensure they know the details of the post you are applying for) and another well-respected colleague in a relevant field.

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Appendix 1: Review of my scientific career

This section could be used to form the basis of the 'statement of interests' often required for academic jobs.

PhD Thesis – Bacterial Competition

Throughout my career I have been fascinated with biologically interesting protein interactions. During my PhD I tackled the important question of bacterial competition. Bacteria kill each other by secreting colicin proteins. They protect themselves by expressing immunity proteins. The cognate colicin-inhibitor complex is one of the most stable and specific in nature. Convention dictated there would be no non-cognate interaction but I discovered the weak binding of Im8 to a highly related colicin, E9. To understand the structural basis for the specificity of colicin-immunity protein interactions I determined the solution structure of Im8 by NMR. By comparing this structure with the structures of Im7 and Im9 (the immunity proteins for colicins E7 and E9) I suggested a structural ground for specificity in their binding to colicins. An image from our publication was chosen for the cover of *Biochemical Journal*. In finishing my thesis I investigated the non-cognate interaction of Im8 with the colicin E9 DNase domain using NMR. This work provided a basis for further PhD studies.

Research Project – Protein Complex Specificity

In the group of David Neuhaus, in collaboration with César Millstein, I addressed DNA: protein complex specificity. Using NMR I addressed the structural basis for DNA recognition by the zinc finger containing DNA binding domain of poly ADP ribose polymerase (PARP-1), an abundant nuclear enzyme involved in DNA repair and apoptosis. In contrast to most zinc finger proteins it recognises a DNA conformation, a single stranded break, rather than a sequence. My NMR studies have revealed the fold of this novel zinc finger and the basis for its molecular interaction. I determined a low resolution solution structure of the target DNA ligand. I honed my molecular biology and protein purification skills as PARP-1 is toxic to bacterial cells. Several tricks were needed to optimise NMR samples. I carried out NMR experiments to study the binding to a nicked DNA ligand. I also contributed to the structure determination of the C-terminal domain of the Inhibitor Protein of F1 ATPase, published in the *Journal of Molecular Biology*.

Current Research – Study of Large Non-Covalent Complexes

Currently, I am a post doctoral researcher in the group of Prof. Carol Robinson. My research is focused on the application of electrospray mass spectrometry to the study of large non-covalent complexes. The instrumentation and expertise in Prof. Robinson's lab provides the unique opportunity to do this. My main project involves observation of intact ribosomes from yeast and *Thermus thermophilus*. I recorded the first tandem mass spectra of the acidic stalk complex from yeast, revealing its spatial arrangement of the various proteins. This dynamic but functionally essential region is inaccessible to high resolution structural approaches. My MS data uniquely reveal that the stalk complexes from thermophilic bacteria have a different stoichiometry from those of mesophiles, indicating a thermal adaptation. This was published in *PNAS*.

My other main focus is the membrane protein complex ATP synthase from *T. thermophilus*. My MS data from micelles containing the entire complex provided the essential information to define the stoichiometry of the stator. We have submitted this to *EMBO Journal*. This project has provided experience in manipulating membrane protein complexes. I was also involved low resolution structural characterisation of the human initiation complex eIF3.

Appendix 2: Scientific Publications

- **Derrick, A.**, Eustermann, S., Cole, T.P., Yang J.C. and Neuhaus, D. (in preparation for JMB) Publication One
- Eustermann, S., **Derrick, A.**, Cole, T.P., Yang J.C. and Neuhaus, D. (in preparation) Publication Two
- Esteban, O., Bernal, R.A., Donohoe, M., **Derrick, A.**, Sharon, M., Robinson, C.V. and Stock, D. (submitted to EMBO Journal) Publication Three
- **Derrick, A.**, Gordiyenko, Y., Zhou, M., DeRoo, S., Hanson, C., Fucini, P., Robinson, C.V. (in preparation) Publication Four
- Damoc, E., Fraser C.S., Zhou, M., **Derrick, A.**, Mayeur, G.W., Hershey J.W.B., Doudna, J.A., Robinson, C.V. and Leary, J.A. (2007) Publication Five (2007 Feb 23; [Epub ahead of print])
- **Derrick, A.** and Robinson, C.V. (2007) Publication Six, volume 6, editors M. Gross and R. Caprioli
- Ilag, L.L.*, **Derrick, A.***, McKay, A.R., Sobott, F., Fucini, P., Nierhaus, K. and Robinson, C.V. (2005) Publication Seven Proc. Natl. Acad. Sci. USA. **102** 8192-8197 *shared first authors
- **Derrick, A.**, McKay, A., Ilag, L.L., Hanson C.L. and Robinson C.V. (2005) Publication Eight FEBS Letters Special Issue 130th Nobel Symposium **579** 943–947
- Cooper, A., Kennedy, M.W., Fleming, R., Wilson, E.H., **Derrick, A.**, Wokosin, D.L., Su, T.-j., Green, R.J. and Lu, J.R. (2005) Publication Nine, Biophys. J. **88**(3) 2114-25
- Hanson, C.L., **Derrick, A.**, Santos, C., Ballesta, J.P. and Robinson, C.V. (2004) Publication Ten J. Biol. Chem. **279** (41) 42750-42757
- Gordon-Smith, D.J., Carbajo, R.J., Yang, J.-C., **Derrick, A.**, Runswick, M.J., Walker, J.E. and Neuhaus, D. (2001) Publication Eleven J. Mol. Biol. **308** 325-339
- **Derrick, A.**, Geertjes, G. and Videler, J.J. (1999) Publication Twelve, J. Fish Biol. **54** 1123-1126
- Dennis, C. A., **Derrick, A.**, Pauptit, R. A., Wallis, R., James, R., Moore, G.R. and Kleanthous, C. (1998) Publication Thirteen, Biochem. J. **333** 183-191
- Wallis, R., Leung, K.-Y., Pommer, A., **Derrick, A.**, Moore, G. R., James, R. and Kleanthous, K. (1995) Publication Fourteen, Biochemistry **34** 13751-13759
- **Derrick, A.**, Osborne, M.J., Moore, G.R., James, R. and Kleanthous, K. (1994) Publication Fifteen, J. Protein Chem