MARK KREBS, D.PHIL.

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OBJECTIVE

To lead a multidisciplinary team that enables informed decision taking regarding the suitability for further development, improvement and production of antibodies and derivative structures based on a multi-faceted biophysical characterization.

SKILLS

- Experienced in miniaturising and streamlining assays. Expert user of many biophysical techniques including DSC, SEC-MALS and DLS, UV/Vis, CD and fluorescence spectroscopy, SEC.
- Excellent communication skills through publications, presentations and collaborations with scientists from different backgrounds
- Management experience from managing two FTEs, student supervision and setting up and running a lab

PROFESSIONAL EXPERIENCE

Pfizer, Cambridge, MA

Principal Research Scientist, Global Biotherapeutic Technologies; 2008 to current

- Designed multi-level small-scale biophysical assays to assess stability and manufacturability of multiple candidates at an early stage in each project
- Continued database analysis to predict stability based on sequence alone
- Manage 2 FTEs
- Over 500 proteins tested to date in multiple assays for over 20 projects
- Collaborating with colleagues from several other sites for instrument usage, knowledge and best practices exchange and model and predict stability of drug candidates

UCB Celltech, Slough, UK

Senior Scientist, Antibody Biology; 2007 to 2008

- Designed antibody stability and refolding assays using CD spectroscopy and steady-state and stopped-flow fluorescence spectroscopy
- Initiated collaborative projects on antibody purification, characterisation and aggregation; developed fluorescence and FRET assays using antibodies and Fabs I purified

Cavendish Lab., University of Cambridge, Cambridge, UK

Postdoctoral Researcher; 2002 to 2007

- Determined the principles of protein misfolding, amyloid formation and aggregation
- Supervised students and lectured to the general public, school children and students

Biological Safety Officer; 2004 to 2007:

- Set up the department's cell culture and protein expression lab; trained and supervised 10 users

EDUCATION

University of Oxford, Doctor of Philosophy, Chemistry, 2002

Study of protein misfolding and the structure and properties of amyloid fibrils

- Thesis title: The Chemical Mystery of Amyloid Fibrils
- Techniques used include NMR, FTIR, CD, PAGE, UV/VIS, TEM & dye binding

Imperial College, University of London, Bachelor of Science, Chemistry, 1998

- First Class Honors degree; optional subject: mathematics

Selected Peer-Reviewed Publications

- "High-throughput measurement, correlation analysis and machine-learning predictions for thermal stability of Pfizer-generated antibodies", King A.C., Woods M., Liu W., Lu Z., Gill D. and Krebs M.R.H., Protein Sci. (2011), **20**,1546-1557;
- "Amyloid fibril-like structure underlies the aggregate structure across the pH range for β-lactoglobulin", Krebs M.R.H., Devlin G.L. and Donald A.M., Biophys. J. (2009), **96**, 5013-5096;
- "The Formation of Nematic Liquid Crystal Phases by Hen Lysozyme Amyloid Fibrils", Corrigan A.M., Müller C., Krebs M.R.H., J. Am. Chem. Soc. (2006), **128**, 14740-14741;
- "The Binding of Thioflavin-T to Amyloid Fibrils: Localisation and Implications" Krebs M.R.H., Bromley, E.H.C., Donald, A.M. J. Struct. Biol. (2005), **149**, 30-37;
- "The Formation of Spherulites by Bovine Insulin Amyloid Fibrils", Krebs M.R.H., MacPhee C.E., Miller A.F., Dunlop I., Dobson C.M. and Donald A.M. Proc. Natl. Acad. Sci. USA (2004), **101**, 14420-14424
- "Observation of Sequence Specificity in the Seeding of Protein Amyloid Fibrils" Krebs M.R.H., Morozova-Roche L., Daniel K., Robinson C.V. and Dobson C.M., Protein Sci. (2004), **13**, 1933-1938

(Complete list of publications is available on request)

Invited international talks

- Invited lecture at McDaniel College, MD, USA, March 2007
- Lectured at several American universities, including Harvard & UCSF, August 2006
- 3rd Biannual Self-Assembly of Peptides & Proteins Workshop, Crete, Greece, August 2003
- 1st Symposium on Protein Folding (IMB, Jena, Germany, September 2002
- 2nd Biannual Self-Assembly of Peptides & Proteins Workshop, Crete, Greece, July 2001
- 14th Annual American Protein Society Meeting, San Diego, USA, August 2000

Grants, Scholarships

- British Council Partnership Program in Science Grant, 2005-2006
- St. Catherine's College Senior Scholarship for the Physical Sciences, 1999-2001
- 3M Scholarship, 1998-2001

Professional memberships

- The Biophysical Society, Bethesda, MD, USA
- The Institute of Physics, London, UK

Languages

- Dutch, English and Spanish, fluent
- German and French, intermediate to good

Other interests

Travel, photography, classical music and opera, cooking

High-throughput measurement, correlation analysis, and machine-learning predictions for pH and thermal stabilities of Pfizer-generated antibodies.
King AC, Woods M, Liu W, Lu Z, Gill D, Krebs MRH
Protein Sci., 2011, 20, 1546-57

Protein aggregation: more than just fibrils.
Krebs MRH, Domike KR, Donald AM.
Biochem Soc Trans., 2009, 37, 682-6

Amyloid fibril-like structure underlies the aggregate structure across the pH range for beta-lactoglobulin.
Krebs MRH, Devlin GL, Donald AM.
Biophys J. 2009 Jun 17;96(12):5013-9

Common motifs in protein self-assembly
Krebs MRH, Domike KD, Cannon D and Donald AM
Faraday Discuss., 2008, 139,265-74

Mechanisms of structure formation in particulate gels of beta-lactoglobulin formed near the isoelectric point.
Bromley EHC, Krebs MRH and Donald AM
Eur Phys J E Soft Matter. 2006, 21, 145-52

Protein particulates: another generic form of protein aggregation?
Krebs MRH, Devlin GL and Donald AM
Biophys J. 2007, 92, 1336-42

The formation of nematic liquid crystal phases by hen lysozyme amyloid fibrils.
Corrigan AM, Müller C and Krebs MRH
J Am Chem Soc. 2006, 128. 14740-1

Apomyoglobin reveals a random-nucleation mechanism in amyloid protofibril formation.
Fändrich M, Zandomeneghi G, Krebs MRH, Kittler M, Buder K, Rossner A, Heinemann SH, Dobson CM and Diekmann S
Acta Histochem. 2006, 108, 215-9

Optical microscopy of growing insulin amyloid spherulites on surfaces in vitro.
Rogers SS, Krebs MRH, Bromley EHC, van der Linden E and Donald AM
Biophys J. 2006, 90, 1043-54
Assisted with experimental design, data interpretation and article writing.

Aggregation across the length-scales in beta-lactoglobulin.
Bromley EHC, Krebs MRH and Donald AM
Faraday Discuss. 2005, 128, 13-27

The binding of thioflavin-T to amyloid fibrils: localisation and implications.

Krebs MRH, Bromley EHC and Donald AM
J Struct Biol. 2005, 149, 30-7

The mechanism of amyloid spherulite formation by bovine insulin.
Krebs MRH, Bromley EHC, Rogers SS and Donald AM
Biophys J. 2005, 88, 2013-21

FTIR reveals structural differences between native beta-sheet proteins and amyloid fibrils.
Zandomeneghi G, Krebs MRH, McCammon MG and Fändrich M
Protein Sci. 2004, 13, 3314-21

The formation of spherulites by amyloid fibrils of bovine insulin.
Krebs MRH, Macphee CE, Miller AF, Dunlop IE, Dobson CM and Donald AM
Proc Natl Acad Sci U S A. 2004, 101, 14420-4

Observation of sequence specificity in the seeding of protein amyloid fibrils.
Krebs MRH, Morozova-Roche LA, Daniel K, Robinson CV and Dobson CM
Protein Sci. 2004, 13, 1933-8

Formation and seeding of amyloid fibrils from wild-type hen lysozyme and a peptide fragment from the beta-domain.
Krebs MRH, Wilkins DK, Chung EW, Pitkeathly MC, Chamberlain AK, Zurdo J, Robinson CV and Dobson CM
J Mol Biol. 2000, 300, 541-9