

Hannes Ludewig

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Date of Birth: 29th of November 1988. Nationality: German

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I am a biochemist with strong research interests in enzymology and structural biology. My research is focussing on biocatalysis with emphasis on enzymes involved in cyclic peptide biosynthesis. I am employing bio-macromolecular X-ray crystallography, enzyme kinetics and biophysical methods to expand the fundamental understanding of how these enzymes work in order to harness their biocatalytic potential to generate a wide variety of bioactive cyclic peptides *via* biotransformations.

AWARDS AND HONOURS

2015 George and Stella Lee Scholarship, University of St Andrews

Employment Record

Postgraduate visiting student Blankenfeldt group, Division for structure and function of proteins , Helmholtz Centre for Infection Research, Braunschweig, GER

May 2014 - October 2014: Structural and functional studies of alternative sigma factors from *Pseudomonas aeruginosa*. (Master's thesis)

Postgraduate visiting student Taylor group, Biomedical Sciences Research Complex, University of St Andrews, UK

January 2014 - March 2014: Structural and functional studies of eukaryotic neuraminidases.

Postgraduate visiting student Naismith group, Biomedical Sciences Research Complex, University of St Andrews, UK

October 2013 - December 2013: Structural and functional studies of cyclodehydratases involved in the biosynthesis of cyanobactins.

Undergraduate research assistant, Clemens group (plant physiology), Faculty of Natural Science, University of Bayreuth, GER

July 2011 - September 2011: Gene mapping of genes involved in *Arabidopsis thaliana* stress response.

Education

PhD, University of St Andrews, UK, Professor J. H. Naismith and Professor R. J. M. Goss

September 2015 - present

Structural and functional characterisation of enzymes involved in cyclic peptide biosynthesis.

MSc Biochemistry and Molecular Biology, University of Bayreuth, GER

2012 - 2014

BSc Biochemistry, University of Bayreuth, GER

2009-2011

Skills and Knowledge

- Cloning
- Heterologous gene expression
- Protein purification
- Enzyme kinetics
- Bio-macromolecular X-ray crystallography
- Biophysical characterisation of proteins (ITC, CD, MS, UV-Vis and Fluorescence)
- Assay development

Research presentations

- Poster, CRITICAT CDT 4th Annual Conference, Edinburgh, UK, April 2018: PCY1 - a macrocyclase from plant enables simple biosynthesis of cyclic peptides
- Poster, 3rd annual post-graduate symposium School of Chemistry, St Andrews, UK, December 2017: PCY1 - a macrocyclase from plant enables simple biosynthesis of cyclic peptides, **poster prize awarded**
- Poster, 3rd Biennial Structural Biology Conference, Brno, CZ, May 2017: A novel macrocyclase, **poster prize awarded**
- Speaker, CRITICAT CDT 3rd Annual Conference, St Andrews, UK, April 2017: A novel macrocyclase
- Poster, 34th European Peptide Symposium & 8th International Peptide Symposium, Leipzig, GER, August 2016: A novel macrocyclase
- Speaker, CRITICAT CDT 2nd Annual Conference, St Andrews, UK, April 2016: Structural and functional investigation of new macrocyclases

Funding Awarded

2015 - 2019 CRITICAT CDT programme, St Andrews

2013 Erasmus mobility stipend

Outreach

September 2017	Science day with Craig primary school, Byre Theatre St Andrews
July 2017	Sutton Trust lectures, University of St Andrews, School of Chemistry, St Andrews
July 2016	Sutton Trust lectures, University of St Andrews, School of Chemistry, St Andrews

PUBLICATIONS

Ludewig, H., Czekster, C.M., Oueis, E., Munday, E.S., Arshad, M., Synowsky, S.A., Bent, A.F., Naismith, J.H., 2018. Characterization of the Fast and Promiscuous Macrocyclase from Plant PCY1 Enables the Use of Simple Substrates. ACS Chem. Biol. 13, 801–811.

Czekster, C.M., **Ludewig, H.**, McMahon, S.A., Naismith, J.H., 2017. Characterization of a dual function macrocyclase enables design and use of efficient macrocyclization substrates. *Nature Communications* 8, 1045.

Oueis, E., Adamson, C., Mann, G., **Ludewig, H.**, Redpath, P., Migaud, M., Westwood, N. J., Naismith, J. H., 2015. Derivatisable Cyanobactin Analogues: A Semisynthetic Approach. *ChemBioChem* 16, 2646–2650.

Koehnke, J., Mann, G., Bent, A.F., **Ludewig, H.**, Shirran, S., Botting, C., Lebl, T., Houssen, W.E., Jaspars, M., Naismith, J.H., 2015. Structural analysis of leader peptide binding enables leader-free cyanobactin processing. *Nature Chemical Biology* 11, 558.