Next generation bacitracin: reimagining a classic antibiotic

Buijs, N.P.

Curriculum Vitae

Ned Peter Buijs was born on the 15th of July 1994 in Cairns, Australia. In 2018 he graduated from the University of Glasgow with a First Class MSci Chemistry degree. Whilst studying, he completed a year-long industrial placement at Procter & Gamble yielding seven patents. Ned completed his Master's project in the lab of Prof. dr. Andrew Sutherland working on *The Synthesis of Fluorescent Benzotriazole α-Amino Acids*. Soon after graduation Ned was nominated by the University of Glasgow for the prestigious UK-wide Salter's Graduate Award which he subsequently won. The £1000 prize is awarded to final-year chemistry undergraduates studying at UK universities and '*celebrates candidates that demonstrate the ability to become leaders within their field*'.

In 2019 Ned joined the lab of Prof. dr. Nathaniel I. Martin as a PhD candidate in the Biological Chemistry group in the Institute of Biology at Leiden University. Ned's research primarily focused on the chemical synthesis, and biological evaluation, of novel analogues of the peptide antibiotic bacitracin A for the treatment of infections with Gram-positive bacteria. He also worked on the preparation of novel peptide inhibitors of lipoprotein signal peptidase II (LspA), an essential enzyme in Gram-negative bacteria. During his PhD, Ned also worked outside the field of antibiotics, specifically on the development of small-molecule inhibitors of nicotinamide *N*-methyltransferases, a human enzyme implicated in a variety of diseases. During his studies Ned presented his research in a variety of poster and oral presentations including at CHAINS (Veldhoven 2021), The Gordon Research Conference (Barga, Italy 2022), and at the Dutch Peptide Symposium (Leiden 2023).

Ned's interests include medicinal chemistry, microbiology, solid-phase peptide chemistry, chemical biology, antibacterial agents, and rock climbing.

List of Publications

Journal Articles

1. N. P. Buijs, E. Matheson, S. A. Cochrane and N. I. Martin, Targeting Membrane-Bound Bacterial Cell Wall Precursors: A Tried and True Antibiotic Strategy in Nature and the Clinic, *Chem. Commun.*, 2023, **59**, 7685–7703.

2. N. Buijs, H. C. Vlaming, M. J. van Haren and N. I. Martin, Synthetic Studies with Bacitracin A and Preparation of Analogues Containing Alternative Zinc Binding Groups, *ChemBioChem*, 2022, **23**, e202200547.

3. T. M. Wood, M. R. Zeronian, N. Buijs, K. Bertheussen, H. K. Abedian, A. V. Johnson, N. M. Pearce, M. Lutz, J. Kemmink, T. Seirsma, L. W. Hamoen, B. J. C. Janssen and N. I. Martin, Mechanistic Insights Into The C_{55}-P Targeting Lipopeptide Antibiotics Revealed by Structure-Activity Studies and High-Resolution Crystal Structures, *Chem. Sci.*, 2022, **13**, 2985–2991.

4. M. J. Van Haren, Y. Gao, N. Buijs, R. Campagna, D. Sartini, M. Emanuelli, L. Mateuszuk, A. Kij, S. Chlopicki, P. Escud, R. Schiffelers and N. I. Martin, Esterase-Sensitive Prodrugs of a Potent Bisubstrate Inhibitor of Nicotinamide *N*-Methyltransferase (NNMT) Display Cellular Activity, *Biomolecules*, 2021, **11**, 1357.

5. M. J. van Haren, Y. Zhang, V. Thijssen, N. Buijs, Y. Gao, L. Mateuszuk, F. A. Fedak, A. Kij, R. Campagna, D. Sartini, M. Emanuelli, S. Chlopicki, S. A. K. Jongkees and N. I. Martin, Macrocyclic Peptides as Allosteric Inhibitors of Nicotinamide *N*-Methyltransferase (NNMT), *RSC Chem. Biol.*, 2021, **2**, 1546–1555.

6. Y. Gao, M. J. van Haren, N. Buijs, P. Innocenti, Y. Zhang, D. Sartini, R. Campagna, M. Emanuelli, R. B. Parsons, W. Jespers, H. Gutiérrez-de-Terán, G. J. P. van Westen and N. I. Martin, Potent Inhibition of Nicotinamide *N*-Methyltransferase by Alkene-Linked Bisubstrate Mimics Bearing Electron Deficient Aromatics, *J. Med. Chem.*, 2021, **64**, 12938–12963.

7. J. D. Bell, T. E. F. Morgan, N. Buijs, A. H. Harkiss, C. R. Wellaway and A. Sutherland, Synthesis and Photophysical Properties of Benzotriazole-Derived Unnatural α-Amino Acids, *J. Org. Chem.*, 2019, **84**, 10436–10448.

8. R. J. Faggyas, N. L. Sloan, N. Buijs and A. Sutherland, Synthesis of Structurally Diverse Benzotriazoles via Rapid Diazotization and Intramolecular Cyclization of 1,2-Aryldiamines, *Eur. J. Org. Chem.*, 2019, 5344–5353.

Submitted Manuscripts

9. N. P. Buijs, H. C. Vlaming, I. Kotsogianni, M. Arts, J. J. Willemse, Y. Duan, F. M. Alexander, S. A. Cochrane, T. Schneider, N. I. Martin, Rationally Designed Bacitracin Variants Exhibit Potent Activity Against Vancomycin-Resistant Pathogens, *manuscript submitted.*

Patents

1. N. I. Martin, Y. Gao, M. J. van Haren, N. Buijs, R. B. Parsons, M. Emanuelli, D. Sartini, 2022, NL 2027866 B1
2. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2019, US 10 501 711 B2
3. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2018, US 2018/0362904 A1
4. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, K. M. Perrie, R. R. F. Keuleers, N. P. Buijs, 2018, WO 2018/231679 A1
5. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2018, WO 2018/231787 A1
6. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2018, WO 2018/231798 A1
7. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2018, WO 2018/231883 A1
8. N. P. Somerville Roberts, A. T. Brooker, C. Pickering, N. P. Buijs, 2018, EP 3 415 605 A1