Antibiotic Discovery: from mechanistic studies to target ID

Kotsogianni, A.I.

List of Publications

Journal articles

1. Bakker, A.T.,‡ Kotsogianni I.,‡ Mirenda, L., Straub, V.M., *et al.* Chemical proteomics reveals antibiotic targets of oxadiazolones in MRSA. *J. Am. Chem. Soc.* **145**, 1136–1143 (2023).

2. Deisinger, J.P., Arts, M., Kotsogianni, I., Puls, J., *et al.* Dual targeting of the class V lanthipeptide antibiotic cacaoidin. *iScience* (2023), doi: 10.1016/j.isci.2023.106394.

3. Slingerland, C.J., Kotsogianni, I., Wesseling, C. M. J. & Martin, N.I. Polymyxin stereochemistry and its role in antibacterial activity and outer membrane disruption. *ACS Infect. Dis.* **8**, 2396–2404 (2022).

4. Kotsogianni, I., Wood, T.M., Alexander, F.M., Cochrane, S. A. & Martin, N.I. Binding studies reveal phospholipid specificity and its role in the calcium-dependent mechanism of action of daptomycin. *ACS Infect. Dis.* **7**, 2612–2619 (2021).

5. Haren, M. J., Tehrani, K.H.M.E., Kotsogianni, I., Wade, N. *et al.* Cephalosporin prodrug inhibitors overcome metallo-β-lactamase driven antibiotic resistance. *Chem. – A Eur. J.* **27**, 3806–3811 (2021).

6. Yakovlieva, L., Wood, T.M., Kemmink, J., Kotsogianni, I., *et al.* A β-hairpin epitope as novel structural requirement for protein arginine rhamnosylation. *Chem. Sci.* **12**, 1560–1567 (2021).

7. Mock, E.D.; Kotsogianni, I., Driever, W.P.F.; Fonseca, C.S., *et al.* Structure–activity relationship studies of pyrimidine-4-carboxamides as inhibitors of *N*-acylphosphatidylethanolamine phospholipase D. *J. Med. Chem.* **64**, 481–515 (2021).

8. Chiorean, S., Antwi, I., Carney, D.W., Kotsogianni, I., *et al.* Dissecting the binding interactions of teixobactin with the bacterial cell-wall precursor lipid II. *ChemBioChem* **21**, 789–792 (2020).

9. Mock, E.D., Mustafa, M., Gunduz-Cinar, O., Cinar, R., *et al.* Discovery of a NAPE-PLD inhibitor that modulates emotional behavior in mice. *Nat. Chem. Biol.* **16**, 667–675 (2020).

Manuscripts in preparation

10. Bakker, A.T.‡ Kotsogianni I.,‡ Avalos, M., Punt, J.M., *et al.* Discovery of isoquinoline sulfonamides as gyrase inhibitors active against fluoroquinolone-resistant bacteria. *Manuscript under revision at Nat. Chem.*

11. Van Groesen, E., Mons, M.W.E., Kotsogianni, I., Arts, M., *et al.* The guanidino lipoglycopeptides: Novel semisynthetic glycopeptides with potent *in vitro* and *in vivo* antibacterial activity. *Manuscript under revision at Sci. Trans. Med.*

‡denotes equal contribution

Patent applications

Netherlands Priority Patent Application Number: N2033609; Title: DNA gyrase inhibitors. Inventors: Bakker, A.T., Kotsogianni, I., van der Stelt, M., Martin, N.I., Ghilarov, D., Avalos, M., Punt, J.M., Liu, B., Piermarini, D., van Boeckel, C.A.A., van Wezel, G.P., van der Berg, R. Priority date: November 24, 2022.

International Application Number: PCT/NL2020/050226 | WO/2020/204715 Prodrug metallo-beta-lactamase inhibitors. Inventors: Martin, N.I., van Haren M.J., Tehrani, K.H.M.E., Kotsogianni, I., Wade, N., Priority date April 2, 2019.

International Application Number: PCT/EP2019/064213 | WO/2019/229250 Inhibitors of *N*-acetylphosphatidylethanolamine phospholipase D. Inventors: Mock, E. D., Kotsogianni, I., Van Boeckel, S., Van der Stelt, M., Priority date May 31, 2019.

Poster presentations

Kotsogianni, I., 't Hart, P., Kleijn, L.H.J. & Martin, N.I., Mechanistic studies of cell wall targeting antibiotics using isothermal titration calorimetry. Poster presented at: NWO CHAINS, Veldhoven 2021, New Antibacterial Discovery and Development Gordon Research Seminar, 23,24 July 2022 and Gordon Research Conference, 24-29 July 2022, Barga, LU, Italy.

Curriculum vitae

Ioli Kotsogianni (Angeliki Ioli Kotsogianni Teftsoglou) was born in Athens, Greece, on the 19th of May 1990. In 2014 she graduated from the Department of Chemistry, at the University of Athens. In the final year of the Bachelor's program she joined the lab of Prof. dr. Thanasis Gimisis to work on *Synthesis of Glycogen Phosphorylase Inhibitors* and solidify a specialization in organic chemistry, concluding in the diploma Thesis *Study of triazole substitution reactions*. In 2015, she pursued a MSc degree in R*esearch in Chemistry, Chemical Biology* in Leiden University, where she focused on medicinal chemistry as an intern in Molecular Physiology, under the supervision of Prof. dr. Mario van der Stelt. Her master's thesis: *Design and synthesis of NAPE-PLD inhibitors* and literature study on *Artificial transmembrane signaling,* granted her the MSc diploma, *cum laude* in September 2017.

In 2018 she joined the research group of Prof. dr. Nathaniel I. Martin as a PhD candidate in Biological Chemistry and shifted gears to antibiotic research within the Institute of Biology Leiden. Throughout her PhD research, Ioli has collaborated frequently and fruitfully with several research groups including those of Prof. dr. Tanja Schneider, Prof dr. Mario van der Stelt, Prof dr. Gilles van Wezel, Dr. Stephen Cochrane, Prof dr. Marthe T.C. Walvoort and Prof. dr. John C. Vederas. The applications of calorimetric techniques described in this thesis were presented as a poster at NWO CHAINS, Veldhoven 2021, New Antibacterial Discovery and Development Gordon Research Seminar and Conference, Barga, Italy 2022. As of December 2022 Ioli continues to support the Biological Chemistry Group as a postdoctoral researcher.