The synthesis and biological applications of photo-activated ruthenium anticancer drugs

Lameijer, L.N.

Curriculum Vitae

Lucien Lameijer was born in Nieuweschans on the 14th of August in 1985. After obtaining his high school diploma (HAVO) in 2005 at the ID College Gouda, he started studying chemistry at the Hogeschool Leiden. During this bachelor program he took courses from the BSc program Molecular Science & Technology at Leiden University and performed a research internship under the supervision of Dr. Wouter Hogendorf and Prof. Dr. Gijs van der Marel at the Biosyn group. During this internship he synthesized phosphoramidites based on *N*-acetyl glucosamine as precursors for teichoic acid fragments. He received his BSc degree in Applied Sciences (BASc) in May 2011, after which he continued his studies with a master Chemistry (Design & Synthesis) at Leiden University. A second research internship was carried out as part of his MSc curriculum on the synthesis of an orthogonally protected supernucleoside under the supervision of Dr. Hans Kistemaker and Dr. Dmitri Filippov at the Biosyn group. He obtained his MSc degree in May 2013.

In July 2013, he started as a PhD candidate in the research group "Metals in Catalysis, Biomimetics & Inorganic Materials" (MCBIM) at Leiden University. Under the supervision of Dr. Sylvestre Bonnet and Prof. Dr. Lies Bouwman he conducted the research presented in this thesis. Posters on parts of his work have been presented at the HRSMC symposium (2015 Amsterdam, 'Best poster prize'), CHAINS conference (2015, Veldhoven) and Gordon Research Conference 'Metals in Medicine' (2016, Andover, NH, USA). At CHAINS 2016, Lucien gave an oral presentation on "*D- versus L-glucose conjugation: Mitochondrial Targeting of a Light-Activated Ruthenium-Based Anticancer Prodrug*".

During the course of his graduate program he participated in the following courses:

- HRSMC summer school "Advanced Metal-Organic Chemistry and Catalysis"
- HRSMC Photochemistry school "Photochemistry, Fundamentals and Applications"
- HRSMC Physical Methods in Inorganic Chemistry
- Effective Communication
- Communication in Science
- On Being a Scientist
- Time Management

List of publications

1. **A red light-activated ruthenium-caged NAMPT inhibitor remains phototoxic in hypoxic cancer cells**
   L. N. Lameijer, D. Ernst, S. L. Hopkins, M. S. Meijer, S. H. C. Askes, S. E. Le Devedec, S. Bonnet, *Angew Chem Int Ed* **2017**, *56*, 11549-11553.

2. **D- Versus L-Glucose Conjugation: Mitochondrial Targeting of a Light-Activated Dual-Mode-of-Action Ruthenium-Based Anticancer Prodrug**
   L. N. Lameijer, S. L. Hopkins, T. G. Brevé, S. H. C. Askes, S. Bonnet, *Chem Eur J* **2016**, *22*, 18484-18491.

3. **Synthesis of Well-Defined Adenosine Diphosphate Ribose Oligomers**
   H. A. V. Kistemaker, L. N. Lameijer, N. J. Meeuwenoord, H. S. Overkleeft, G. A. van der Marel, D. V. Filippov, *Angew Chem Int Ed* **2015**, *54*, 4915-4918.

4. **Fluorous linker facilitated synthesis of teichoic acid fragments**
   W. F. Hogendorf, L. N. Lameijer, T. J. Beenakker, H. S. Overkleeft, D. V. Filippov, J. D. Codee, G. A. Van der Marel, *Org Lett* **2012**, *14*, 848-851.

5. **Photodynamic therapy or photoactivated chemotherapy? A thorough study of glycoconjugates based upon the $[Ru(tpy)(NN)(L)]^{2+}$ scaffold**
   L. N. Lameijer, T. G. Brevé, V. H. S. van Rixel, S. H. C. Askes, M. Siegler, S. Bonnet.; *Manuscript in preparation*

6. **$[Ru(phbpy)(N\text{-}N)(dmso\text{-}\kappa S)]^{+}$: A new photo-active chiral cyclometalated analogue of the $Ru(tpy)(N\text{-}N)(dmso\text{-}kS)^{2+}$ scaffold**
   L. N. Lameijer, C. J. van de Griend, A. G. Volbeda, M. A. Siegler, S. Bonnet; *Manuscript in preparation*

7. **The synthesis of *O*-1 to *O*-6 substituted positional isomers of D-glucose-thioether ligands and their ruthenium polypyridyl conjugates**
   L. N. Lameijer, S. Bonnet.; *Manuscript in preparation.*