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Toward selective anticancer metallodrugs

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CURRICULUM VITAE

Vincent van Rixel was born in Beverwijk, The Netherlands on 28 November 1987. In 2006 he graduated from the Kennemer College High School in Beverwijk at the gymnasium level. In 2010, he received his Bachelor of Science degree in Molecular Science and Technology of Leiden University and Technical University Delft. During the BSc program he visited Sofia University (Tokyo, Japan) in 2007 for a summer school program, and Occidental College (Los Angeles, USA) in 2010 for a summer research program. His bachelor thesis was entitled '*Nickel NHC-Complexes in the Hydrosilylation of Alkynes*'. In 2012, he received a Master of Science degree in Chemistry with a specialization in 'Science Communication and Society' at Leiden University. His chemistry thesis was entitled '*Photo-Active Anticancer Prodrugs based on [Ru(H₂bapbpy)(SRR')₂]²⁺*' and his science communication thesis was entitled '*Online Science and Technology Communication: Interactivity and social media in The Netherlands*'. In 2013, he received a second Master of Science degree in Public Administration with a specialization in 'International Public Administration' at Leiden University. His public administration thesis was entitled '*The Influence of International Focusing Events on Domestic Policy: A Study on the Effect of the Fukushima Nuclear Crisis on Dutch Nuclear Energy Policy*'.

In February 2013 he started his PhD research under the supervision of Dr. S. Bonnet and Prof. Dr. E. Bouwman in the research group 'Metals in Catalysis, Biomimetics and Inorganic Materials' (MCBIM) of the Leiden Institute of Chemistry, Leiden University. During his PhD studies, he collaborated with Dr. T. Marzo, Prof. Dr. C. Bazzicalupi, and Prof. Dr. L. Messori (University of Florence), Dr. A. Kornienko and Dr. T. Betancourt (Texas State University), Prof. Dr. W. Berger (Institute for Cancer Research, Medical University of Vienna), G. Moolenaar and Dr. N. Goosen (Leiden University), Prof. Dr. F. Ariese (VU Amsterdam), Prof. Dr. B. Liagre (University of Limoges), and Dr. N. Pannu (Leiden University). In 2016 he went to Florence to investigate the '*Interaction of Light-activatable Ruthenium Polypyridyl Complexes with ODNs*' which was financially supported by COST Action CM1105 (Ref. 32634). In total, he supervised one MSc and four BSc students and frequently supervised first and second year chemistry lab courses.

He presented parts of the research described in this thesis at the following meetings and conferences:

- Reedijk Symposium 2013, Leiden, The Netherlands (poster).
- Holland Research School of Molecular Chemistry (HRSMC) Symposium, 2013 and 2014 in respectively Leiden and Amsterdam, The Netherlands (poster).
- 17th International Conference on Biological Inorganic Chemistry (ICBIC17), 2015, Beijing, China (poster).
- WG-5 meeting of the COST Action CM1105, 2015, Belgrade, Serbia (oral).
- Chemistry as Innovating Science (CHAINS), 2015, Veldhoven, The Netherlands (oral).
- International Symposium on Functional Metal Complexes that Bind to Biomolecules – 4th Whole Action Meeting of the COST Action CM1105, 2015, Palma de Mallorca, Spain (oral).

During his PhD research, he participated in the following courses:

- HRSMC Physical Methods in Inorganic Chemistry.
- HRSMC Advanced Metal-Organic Chemistry and Catalysis.
- Master Course 'Metals and Life' (Leiden University).
- Master Course 'Spin and Photochemistry' (Leiden University).
- Graduate School courses of Leiden University: Time management, On being a Scientist, Communication in Science, and Effective Communication.

LIST OF PUBLICATIONS

J. Berding, J. A. van Paridon, **V. H. S. van Rixel** and E. Bouwman, '[NiX₂(NHC)₂] Complexes in the Hydrosilylation of Internal Alkynes', *Eur. J. Inorg. Chem.*, 2011, 2450-2458.

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V. H. S. van Rixel, B. Siewert, S. L. Hopkins, S. H. C. Askes, A. Busemann, M. A. Siegler and S. Bonnet, 'Green light-induced Apoptosis in Cancer Cells by a Tetrapyridyl Ruthenium Prodrug Offering Two Trans Coordination Sites', *Chem. Sci.*, 2016, **7**, 4922-4929.

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B. Siewert, M. Langerman, Y. Hontani, J. T. M. Kennis, **V. H. S. van Rixel**, B. Limburg, M. A. Siegler, V. Talens Saez, R. E. Kieltyka and S. Bonnet, 'Turning on the Red Phosphorescence of a [Ru(tpy)(bpy)(Cl)]Cl Complex by Amide Substitution: Self-aggregation, Toxicity, and Cellular Localization of an Emissive Ruthenium-based Amphiphile', *Chem. Commun.*, 2017, *in press*.

V. H. S. van Rixel, G. F. Molenaar, M. A. Siegler, L. Messori and S. Bonnet, 'Controlling with Light the Interaction between Trans Tetrapyridyl Ruthenium Complexes and an Oligonucleotide', *manuscript submitted*.

V. H. S. van Rixel, A. Busemann, M. F. Wissingh, M. A. Siegler, T. Marzo, C. Bazzicalupi and S. Bonnet, 'Crystal structure of a four-way DNA junction containing a platinum anticancer complex', *manuscript in preparation*.

V. H. S. van Rixel, A. Busemann, B. Siewert, S. L. Hopkins, M. F. Wissingh, M. Falandt, G. Ruigrok, M. A. Siegler, W. Berger and S. Bonnet, 'The metal matters: Tetrapyridyl nickel, palladium, and platinum complexes with minimal to nanomolar anti-cancer activity', *manuscript in preparation*.

V. H. S. van Rixel, T. Ozel, T. Betancourt, L. N. Lameijer, A. Kornienko and S. Bonnet, 'A microtubule-targeted rigidin analogue caged by a ruthenium polypyridyl complex that can be released with green light', *manuscript in preparation*.

V. H. S. van Rixel, M. A. Siegler and S. Bonnet, 'The metal matters II: Protonation and deprotonation of the non-coordinating amines of $[M(H_2bapbpy)]^{2+}$ complexes', *manuscript in preparation*.

V. H. S. van Rixel, L. J. S. Marinelli, M. A. Siegler and S. Bonnet, 'The ligand matters: Pd and Pt anticancer drugs based on a tetrapyridyl ligand containing a single amine bridge', *manuscript in preparation*.

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