Squaramide-based supramolecular polymers : from self-assembly to in vivo application

Saez Talens, V.

Curriculum Vitae

Victorio Saez Talens was born on September 6, 1990 in Carcaixent, País Valencià (Spain). He graduated from the Institut Arabista Ribera Carcaixent in 2008, where he became interested in chemistry and other science related subjects. Thereafter, he started his BSc studies in Chemistry at the University of Valencia. In 2012 he moved to Leiden University within the Erasmus Exchange Program to perform his Master thesis under the supervision of prof. dr. Alexander Kros with the tittle "*Synthesis and characterization of gold bioconjugates*". In 2013, he received the *Licenciatura* degree (equivalent to MSc) in Chemistry at the University of Valencia.

In August 2013, he started his PhD studies in the group of Supramolecular and Biomaterials Chemistry, Leiden Institute of Chemistry, under the supervision of dr. Roxanne E. Kieltyka and prof. dr. Alexander Kros. During his PhD studies, he collaborated with prof. dr. Ilja K. Voets (Technische Universiteit Eindhoven), dr. Judy I. Wu (Houston University) and dr. Sylvestre Bonnet (Universiteit Leiden). Since February 2018 he is working as project manager in ITENE (Packaging, Transport and Logistics Research Center) at the technological group of Advanced Materials, located in Valencia, Spain.

The results reported in this dissertation were presented at the following meetings and conferences:

1. “Aromatic gain as driving force for supramolecular polymerization in water” Jan Reedijk Symposium, Leiden, The Netherlands, October 2014 (*Poster Presentation*).

2. “Aromatic gain as driving force for supramolecular polymerization in water” Chemistry as Innovative Science (CHAINS), Veldhoven, The Netherlands, December 2014 (*Poster Presentation*).

3. “Aromatic gain in a supramolecular polymer” Dutch Polymer Days, Lunteren, The Netherlands, March 2015 (Winner of the first prize *poster presentation* in the Chemistry and Biomedical section).

4. “Aromatic gain in a supramolecular polymer” Chemistry as Innovative Science (CHAINS), Veldhoven, The Netherlands, November 2015 (*Oral Presentation*).

5. “Squaramide-based supramolecular building blocks for supramolecular polymerization” Dutch Polymer Days, Lunteren, The Netherlands, March 2016 (*Poster Presentation*).

6. “Understanding self-assembly in supramolecular polymers” NVvM cryo workgroup spring meeting 2016, NeCEN, Leiden, The Netherlands, April 2016 (*Oral Presentation*).

7. “Modulation of hydrogen-bond strength in a squaramide-based supramolecular polymer” Jan Reedijk Symposium, Leiden, The Netherlands, October 2016 (*Poster Presentation*).

8. “Modulation of the hydrogen-bond strength in a supramolecular polymer” Chemistry as Innovative Science (CHAINS), Veldhoven, The Netherlands, December 2016 (*Poster Presentation*).

9. “Squaramide-based supramolecular polymers: influence of aromaticity on the strength of hydrogen-bond interaction” Dutch Polymer Days, Lunteren, The Netherlands, March 2017 (Winner of the first prize *oral presentation* in the Chemistry section).

10. “Modulation of hydrogen-bond strength in a squaramide-based supramolecular polymer” Advanced Polymers via Macromolecular Engineering (APME), Ghent, Belgium, May 2017 (*Poster Presentation*).

11. “Aromaticity-Modulated Non-Covalent Interactions: A Self-Assembly Mode “Tug-of-War” in Squaramide-Based Supramolecular Polymers” Jan Reedijk Symposium, Leiden, The Netherlands, October 2017 (*Poster Presentation*).

List of publications

1. **V. Saez Talens**, P. Englebienne, T.T. Trinh, W.E.M. Noteborn, I.K. Voets, R.E. Kieltyka. "Aromatic gain in a supramolecular polymer." *Angewandte Chemie International Edition* **2015**, 54, 10502.

2. W.E.M Noteborn, D.N.H. Zwagerman, **V. Saez Talens**, C. Maity, L. van der Mee, J.M. Poolman, S. Mytnyk, J.H. van Esch, A. Kros, R. Eelkema, R.E. Kieltyka. "Crosslinker-Induced Effects on the Gelation Pathway of a Low Molecular Weight Hydrogel." *Advanced materials*, **2017**, 29, 1603769.

3. B. Siewert, M. Langerman, Y. Hontani, J.T.M. Kennis, V.H.S. van Rixel, B. Limburg, M.A. Siegler, **V. Saez Talens**, 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." *Chemical Communications*, **2017**, 53, 11126

4. W.E.M. Noteborn, **V. Saez Talens** and R.E. Kieltyka. "Reversible Loading of Nanoscale Elements on a Multicomponent Supramolecular Polymer System by Using DNA Strand Displacement." *ChemBioChem*, **2017**, 18, 1995

5. C. Tong; T. Liu; **V. Saez Talens**; W.E.M. Noteborn; T.H. Sharp; M. Hendrix; I.K. Voets; C.L. Mummery; V.V. Orlova; R.E. Kieltyka. "Squaramide-based supramolecular materials for 3D cell culture of human induced pluripotent stem cells and their derivatives." *Biomacromolecules,* **2018**, 19, 1091.

6. S.H.C. Askes, N. Bossert, J. Bussmann, **V. Saez Talens**, R.E. Kieltyka, A. Kros, S. Bonnet, and D. Heinrich. "Dynamics of dual-fluorescent polymersomes with durable integrity in living cancer cells and zebrafish embryos". *Biomaterials,* **2018**, 168, 54.

7. **V. Saez Talens**, M. Boraghi, R. Rudge, C.H. Wu, T.T. Trinh, P. Englebienne, I.K. Voets, J.I. Wu, R.E. Kieltyka. "A Self-Assembly Mode "Tug-of-War" in Squaramide-Based Supramolecular Polymers Driven by Aromaticity-Modulated Hydrogen Bonding" *Manuscript in preparation*.

8. **V. Saez Talens**, D.M.M. Makurat, T. Liu, W.E.M. Noteborn, W. Dai, C.L. Guibert, I.K. Voets and R.E. Kieltyka. "Morphological transitions of a squaramide-based

supramolecular polymer nanoparticle in water by modulating its monomer structure.” *Manuscript in preparation.*

9. **V. Saez Talens**, G. Arias Alpizar, J. Bussmann, A. Kros, R.E. Kieltyka. “Biodistribution of squaramide-based supramolecular polymer nanoparticles in zebrafish embryos.” *Manuscript in preparation*.