

Stanford



Laura Rijns

Postdoctoral Scholar, Chemical Engineering

Bio

BIO

Laura Rijns was born in the Netherlands (Nov 10, 1996) and is currently a postdoc at Stanford University with prof. Zhenan Bao in close collaboration with prof. Karl Deisseroth, developing new (opto)genetic, electrical and chemical tools to improve the modulation of neurons both in-vitro and in-vivo.

Laura obtained her PhD (2023) in Biomedical Engineering “cum laude” from Eindhoven University of Technology (TU/e) with prof. Patricia Dankers and prof. E.W. (Bert) Meijer. Supramolecular hydrogels as mimics of the extracellular matrix were developed for cell and organoid culture.

Prior to graduate school, Laura received her BSc (2017) and MSc (2019) in Biomedical Engineering at TU/e in the lab of prof. E.W. (Bert) Meijer, focused on supramolecular assemblies. During her undergraduate studies, she was the Lab Captain of the iGEM TU/e 2016 team, studying regulatable scaffold proteins. In 2017, she worked at UC Santa Barbara in the group of prof. Songi Han, studying liquid-liquid phase separated coacervate polymers. In 2019 and 2023, she worked at EPFL (Switzerland) with prof. Maartje Bastings, studying multivalent interactions using DNA origami.

HONORS AND AWARDS

- MIT ChemE Rising Star, Massachusetts Institute of Technology (MIT) (2024)
- ACS Global Outstanding Graduate Student & Mentor Award in Polymer Science & Engineering, American Chemical Society (2024)
- Stanford Bio-X Travel Award, Stanford University (2024)
- NWO Rubicon Fellow, Dutch Research Council (2024)
- Best PhD Thesis of Department Biomedical Engineering, Eindhoven University of Technology (TU/e) (2024)
- Niels Stensen Fellow, Porticus (2023)
- MDR Young Talent Incentives Award, Materials-Driven Regeneration (2021)

PROFESSIONAL EDUCATION

- Doctor of Philosophy - cum laude, Eindhoven University of Technology , Biomedical Engineering (2023)
- Master of Science, Eindhoven University of Technology , Biomedical Engineering (2019)
- Bachelor of Science, Eindhoven University of Technology , Biomedical Engineering (2017)

STANFORD ADVISORS

- Zhenan Bao, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **Synthetic, multi-dynamic hydrogels by uniting stress-stiffening and supramolecular polymers.** *Science advances*
Rijns, L., Rutten, M. G., Bellan, R., Yuan, H., Mugnai, M. L., Rocha, S., Del Gado, E., Kouwer, P. H., Dankers, P. Y.
2024; 10 (47): eadr3209
- **Mimicking the extracellular world: from natural to fully synthetic matrices utilizing supramolecular biomaterials.** *Nanoscale*
Rijns, L., Rutten, M. G., Vrehan, A. F., Aldana, A. A., Baker, M. B., Dankers, P. Y.
2024
- **Co-Assembled Supramolecular Hydrogelators Enhance Glomerulogenesis in Kidney Organoids Through Cell-Adhesive Motifs** *ADVANCED FUNCTIONAL MATERIALS*
van Sprang, J. F., Aarts, J. M., Rutten, M. A., Rijns, L., Tiemeijer, B. M., Schotman, M. G., Dankers, P. W.
2024; 34 (42)
- **Molecularly Engineered Supramolecular Thermo-responsive Hydrogels with Tunable Mechanical and Dynamic Properties.** *Biomacromolecules*
Rijns, L., Duijs, H., Lafleur, R. P., Cardinaels, R., Palmans, A. R., Dankers, P. Y., Su, L.
2024
- **Using Chemistry To Recreate the Complexity of the Extracellular Matrix: Guidelines for Supramolecular Hydrogel-Cell Interactions.** *Journal of the American Chemical Society*
Rijns, L., Baker, M. B., Dankers, P. Y.
2024
- **BALANCING SCAFFOLD DEGRADATION AND NEO-TISSUE FORMATION IN IN-SITU TISSUE ENGINEERED VASCULAR GRAFTS.** *Tissue engineering. Part A*
Uiterwijk, M., Coolen, B., Rijswijk van, J. W., Söntjens, S., van Houtem, M., Szymczyk, W., Rijns, L., Janssen, H., Wal van der, A., Mol de, B., Bouten, C., Strijkers, G., Dankers, et al
2024
- **Bisurea-Based Supramolecular Polymers for Tunable Biomaterials.** *Chemistry (Weinheim an der Bergstrasse, Germany)*
Vleugels, M., Bosman, R., da Camino, P., Wijker, S., Fehér, B., Spiering, J., Rijns, L., Bellan, R., Dankers, P., Palmans, A. R.
2023: e202303361
- **Importance of Molecular and Bulk Dynamics in Supramolecular Hydrogels in Dictating Cellular Spreading** *CHEMISTRY OF MATERIALS*
Rijns, L., Peeters, J. W., Hendrikse, S. S., Vleugels, M. J., Lou, X., Janssen, H. M., Meijer, E. W., Dankers, P. W.
2023; 35 (19): 8203-8217
- **Controlled, supramolecular polymer formulation to engineer hydrogels with tunable mechanical and dynamic properties** *JOURNAL OF POLYMER SCIENCE*
Rutten, M. A., Rijns, L., Dankers, P. W.
2023
- **The Importance of Effective Ligand Concentration to Direct Epithelial Cell Polarity in Dynamic Hydrogels.** *Advanced materials (Deerfield Beach, Fla.)*
Rijns, L., Hagelaars, M. J., van der Tol, J. J., Loerakker, S., Bouten, C. V., Dankers, P. Y.
2023: e2300873
- **Engineering Strategies to Move from Understanding to Steering Renal Tubulogenesis.** *Tissue engineering. Part B, Reviews*
Hagelaars, M. J., Rijns, L., Dankers, P. Y., Loerakker, S., Bouten, C. V.
2023; 29 (3): 203-216
- **Introducing carbohydrate patterning in mannose-decorated supramolecular assemblies and hydrogels.** *Chemical communications (Cambridge, England)*
Rijns, L., Su, L., Maxeiner, K., Morgese, G., Ng, D. Y., Weil, T., Dankers, P. Y.
2023; 59 (15): 2090-2093

- **Engineered hydrogels for mechanobiology** *NATURE REVIEWS METHODS PRIMERS*
Blache, U., Ford, E. M., Ha, B., Rijns, L., Chaudhuri, O., Dankers, P. W., Kloxin, A. M., Snedeker, J. G., Gentleman, E.
2022; 2 (1)
- **Towards understanding the messengers of extracellular space: Computational models of outside-in integrin reaction networks.** *Computational and structural biotechnology journal*
Karagöz, Z., Rijns, L., Dankers, P. Y., van Griensven, M., Carlier, A.
2021; 19: 303-314