

[Prof. dr. Hélder A. Santos](#)



Prof. dr. Hélder A. Santos (D.Sc. Chem. Eng.)

- Head of the Department of Biomaterials and Biomedical Technology, University Medical Center Groningen, University of Groningen, The Netherlands
- Head of the Translational Bionanomico Theragenerative Medicine Lab, University Medical Center Groningen, University of Groningen, The Netherlands

Prof. Santos (D.Sc. Tech., Chem. Eng.) is a Full Professor and Chair in Biomedical Engineering, and the Head of the Department of Biomaterials and Biomedical Technology, University Medical Center Groningen, University of Groningen. He was also a former Full Professor and Head of Division of Pharmaceutical Chemistry and Technology at the University of Helsinki, Faculty of Pharmacy. Prof. Santos is also the co-founder of the startups Capsamedix Oy and Medixmicro Oy, and was the Coordinator of a large MSCA-ITN P4 FIT network in tendon repair (~ 4.1 m€). He holds an Honorary Adjunct Fellow at the University of Technology Sydney, and held previously Visiting Professorships at the Shanghai Jiao Tong University School of Medicine and University of Tartu. Prof. Santos research interests include the development of nanoparticles/nanomedicines and biomaterials for biomedical applications, particularly cancer and heart diseases. Currently, he (co)-supervises +30 PhD students and 5 MSCA-postdoctoral fellowships. His lab makes the unique bridge between medical engineering, pharmaceutical nanotechnology, and tissue engineering by combining unique techniques to develop novel therapeutic formulations for translation into the clinic. He is co-author of more than +650 publications (+33000 citations; h-index = 104) and 8 patents. He has +300 invited talks around the world. He has (co-)supervised +50 PhD students and +40 postdocs. His former lab members +10 are know well established professors around the world. He is also in Editorial board member of *Advanced Healthcare Materials*, *Advanced Therapeutics*, *Journal of Controlled Release*, *VIEW*, *Journal of Functional Materials*, *Precision Nanomedicine*, *Biomedical Technology*, *Smart Medicine*, among many others. He is Associate Editor of *Nano Select*, and *Drug Delivery and Translational Research*, among others. Prof. Santos has received prestigious honours, awards and grants, such as the "Talent Prize in Science" in 2010 attributed by the Portuguese Government, the European Research Council Starting Grant in 2013, the European Research Council Proof-of-Concept Grant in 2018, the Young Researcher Award in 2013 attributed by the University of Helsinki, the Academy of Finland Award for Social Impact in 2016, and the Controlled Release Society Young Investigator Award 2021. Altogether, Prof. Santos has secured since 2009 +35 research grants nationally and internationally worth of +20 M€.

Key publications

1. Khalil Elbadri*, Manlio Fuscielo, Firas Hamdan, Ruoyu Cheng, Sara Feola, Honey Bokharaie, Carmine D'Amico, Giuseppina Molinaro, Alexandra Correia, Shiqi Wang, Michael Jeltsch, Vincenzo Cerullo, **Hélder A. Santos***, "[Design and in vitro validation of Brome mosaic –virus-like particles for gene delivery and immunomodulation of melanoma](#)", *Mater. Bio Today* **2026**.
2. Ricardo David Flores-Cruz*, Yeshenia Figueroa-DePaz, Maria Carmona Lobita, Luis Felipe Hernández-Ayala, Alejandra Pilar López-Pacheco, Emma Dijkstra, Lena Ruiz-Azuara*, **Hélder A. Santos***, "[A](#)

- [Ratiometric Theranostic Nanoplatform With Acid-Triggered Drug Release and Glutathione-Activated Fluorescence Turn-On](#)", *J. Control. Release* **2025**, 388(Part 1) 1114309.
3. Guobing Feng, Hui Tang, Shuyi Xie, Yingying Wang, Tongyu Wu, Xiongru Cai, Yunyi Zhou, Yan Lu, Yuancheng Bai, Mengfan Zhao, Shuai Hu, Yuezhou Zhang, Mohammad-Ali Shahbazi*, **Hélder A. Santos***, Jin Fan*, Dongfei Liu*, "[Programmable Nanostructure Assembly of a Paclitaxel Derivative Enables Tunable Anticancer Therapy via Hydrogen Bond Engineering](#)", *ACS Nano* **2025**, 19(35), 31799–31817
 4. Qiang Long, Kristina Rabi, Yu Cai, Lihui Li, Shixing Huang, Bei Qian, Yiming Zhong, Zhaoxi Qi, Yecen Zhang, Kaichen Huang, Xinming Wang, Lan Chang, Weichang Xie, Huaiyu Jiang, Haonan Zhang, Junjie Zhang, Ting Ren, Zichen Wang, Tambet Teesalu, Caisheng Wu, Lin Lu, Zhengbin Zhu, Yiwei Chu, **Hélder A. Santos**, Zehua Liu*, Qiang Zhao*, Xiaofeng Ye*, "[Identification of Splenic IRF7 as a Nanotherapy Target for Tele-Conditioning Myocardial Reperfusion Injury](#)", *Nat. Commun.* **2025**, 16, 1909.
 5. Rubén Pareja Tello*, Erwin Pavel Lamparelli, Maria Camilla Ciardulli, Jouni Hirvonen, Goncalo Barreto, Nicola Mafulli, Giovanna Della Porta*, **Hélder A. Santos***, "[Hybrid Lipid Nanoparticles Derived From Human Mesenchymal Stem Cell Extracellular Vesicles by Microfluidic-Sonication for Collagen I mRNA delivery to Human Tendon Progenitor Stem Cells](#)", *Biomater. Sci.* **2025**, 13, 2066-2081.
 6. Cláudio Ferro, Ana I. Matos, Luigia Serpico, Flavia Fontana, Jacopo Chiaro, Carmine D'Amico, Alexandra Correia, Risto Koivula, Marianna Kemell, Maria Manuela Gaspar, Rita C. Acúrcio, Vincenzo Cerullo, **Hélder A. Santos***, Helena F. Florindo*, "[Selenium Nanoparticles Synergize with a KRAS Nanovaccine against Breast Cancer](#)", *Adv. Healthc. Mater.* **2025**, 14(5), 2401523.
 7. Huijie Han, Shiqi Wang, Mohammad-Ali Shahbazi, Yawei Du, Inge S. Zuhorn, Jiachen Li, Jie Chen, Yu Chen, Raquel Bártolo, Wenguo Cui*, **Hélder A. Santos***, "[Local Glycolysis-Modulating Hydrogel Microspheres for a Combined Anti-Tumor and Anti-Metastasis Strategy Through Metabolic Trapping Strategy](#)", *J. Control. Release* **2025**, 378, 320-333.
 8. Carmine D'Amico*, Manlio Fucciello*, Firas Hamdan, Federica D'Alessio, Paolo Bottega, Milda Saklauskaite, Salvatore Russo, Justin Cerioni, Khalil Elbadri, Marianna Kemell, Jouni Hirvonen, Vincenzo Cerullo*, **Hélder A. Santos***, "[Transdermal Delivery of PeptiCRAd Cancer Vaccine Using Microneedle Patches](#)", *Bioact. Mater.* **2025**, 45, 115-127.
 9. Sen Li, Han Gao*, Haoji Wang, Xiaolin Zhao, Da Pan, Idaira Pacheco-Fernández, Ming Ma, Jianjun Liu, Jouni Hirvonen, Zehua Liu*, **Hélder A. Santos***, "[Tailored Polysaccharide Entrapping Metal-Organic Framework for RNAi Therapeutics and Diagnostics in Atherosclerosis](#)", *Bioact. Mater.* **2025**, 43, 376-391.
 10. Pei Zhang, Erik Niemelä, Sandra López Cerdá, Pasi Sorvisto, Jani Virtanen, **Hélder A. Santos***, "[Host-Directed Virus-Mimicking Particles Interacting with the ACE2 Receptor Competitively Block Coronavirus SARS-CoV-2 Entry](#)", *Nano Lett.* **2024**, 24(14), 4055–4063.
 11. Huijie Han, Jie Chen, Jiachen Li, Alexandra Correia, Raquel Bártolo, Mohammad-Ali Shahbazi, Tambet Teesalu, Shiqi Wang*, Wenguo Cui*, **Hélder A. Santos***, "[Enhancing Apoptosome Assembly via Mito-Biomimetic Lipid Nanocarrier for Cancer Therapy Opens in a new tab](#)", *Adv. Funct. Mater.* **2023**, 33(46), 2305316.
 12. Paul Joyce*, Christine J. Allen, María José Alonso, Marianne Ashford, Michelle S. Bradbury, Matthieu Germain, Maria Kavallaris, Robert Langer, Twan Lammers, Maria Teresa Peracchia, Amirali Popat, Clive

- A. Prestidge, Cristianne J. F. Rijcken, Bruno Sarmento, Ruth B. Schmid, Avi Schroeder, Santhni Subramaniam, Chelsea R. Thorn, Kathryn A. Whitehead, Chun-Xia Zhao, **Hélder A. Santos***, "[A Translational Framework to DELIVER Nanomedicines to the Clinic](#)", *Nat. Nanotechnol.* **2024**, *19*, 1597–1611.
13. Han Gao, Sen Li, Zhengyi Lan, Da Pan, Gonna Somu Naidu, Dan Peer, Chenyi Ye, Hangrong Chen, Ming Ma*, Zehua Liu*, **Hélder A. Santos***, "[Comparative Optimization of Polysaccharide-Based Nanoformulations for Cardiac RNAi Therapy](#)", *Nat. Commun.* **2024**, *15*, 5398.
14. Manlio Fusciello, Flavia Fontana, Siri Tähtinen, Cristian Capasso, Sara Feola, Beatriz Martins, Jacopo Chiaro, Karita Peltonen, Leena Ylösmäki, Erkki Ylösmäki, Firas Hamdan, Otto K. Kari, Joseph Ndika, Harri Alenius, Arto Urtti, Jouni T. Hirvonen, **Hélder A. Santos***, Vincenzo Cerullo*, "[Artificially Cloaked Viral Nanovaccine for Cancer Immunotherapy](#)", *Nature Commun.* **2019**, *10*, 5747.
15. Tuying Yong, Xiaoqiong Zhang, Nana Bie, Hongbo Zhang, Xuting Zhang, Fuying Li, Abdul Hakeem, Jun Hu, Lu Gan*, **Hélder A. Santos***, Xiangliang Yang*, "[Tumor Exosome-Based Nanoparticles are Efficient Drug Carriers for Chemotherapy](#)", *Nature Commun.* **2019**, *10*(1), 3838.
16. Hon S. Leong, ..., **Hélder A. Santos**, ..., Chiara Pastore, "[On the Issue of Transparency and Reproducibility in Nanomedicine](#)", *Nature Nanotechnol.* **2019**, *14*, 629–635.

Google Scholar:

https://scholar.google.com/citations?hl=en-EN&user=K3Pj_gwAAAAJ

Personal University website:

<https://research.rug.nl/en/persons/helder-almeida-santos>

LinkedIn:

<https://www.linkedin.com/in/helder-a-santos/>

ORCID:

<https://orcid.org/0000-0001-7850-6309>