Marti Cabanes-Creus, PhD

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CITIZENSHIP Spanish || Australian

ACADEMIC BACKGROUND

Oct. 2015 – April 2019	**Ph. D. in Gene Therapy –** Advisor: Prof. Adrian Thrasher Molecular and Cell Immunology Group University College London, London, UK
Jan. 2016 – May 2018	**Visitor Scholar –** Advisor: A/Prof. Lisowski Translational Vectorology Research Unit Children's Medical Research Institute Westmead, 2145, Australia
Oct. 2013 – June 2015	**M.Sc. in Applied Biotechnology** Uppsala University, Sweden
	Academic Training Gene Transfer, Targeting and Therapeutics Core Salk Institute, California, US
Sep. 2009 – June 2013	**B.S. in Biotechnology** Universitat Autonoma de Barcelona, Spain

APPOINTMENTS

April. 2025 – Current **Senior Scientist, Capsid Engineering– Pattern Biosciences (San Francisco), USA**

- Leading the AAV capsid engineering efforts to generate novel AAV capsids directed to cancer cells.

Mar. 2024 – Mar.2025 **Senior Scientist, Capsid Engineering Team – Spark Therapeutics (Philadelphia), USA**

- Established novel AAV capsid library plasmid designs suitable for machine learning purposes.
- Established novel AAV capsid designs allowing for enhanced DNA-family shuffling.
- Established lentiviral transduced stable cell lines for *in vitro* capsid selection.
- Prepared NGS libraries and actively analysed high-throughput datasets.

Sep. 2020 – Feb. 2024 **Senior Research Officer – Senior Postdoc, Translational Vectorology Unit (TVRU), CMRI**

- Established and lead a group of four scientist within the TVRU, focusing on the development of viral vectors for gene therapy directed to the human liver.
- Designed and executed novel engineering AAV approaches.

Nov. 2018 – Sep. 2020 **Research Officer – Postdoc, Translational Vectorology Unit (TVRU), CMRI**

- Trained and developed staff with various levels of experience.
- Designed and established pipelines for high-throughput AAV plasmid library selection in a xenograft mouse model of human liver.
- Designed and established pipelines for high-throughput NGS-based vector testing in the same model.

PUBLICATIONS

1. Sallard E, Fischer J, Schroeer K, Dawson LM, Beaude N, Affes A, Ehrke-Schulz E, Zhang W, Westhaus A, **Cabanes-Creus M**, Lisowski L, Ruszics Z, Ehrhardt A. ADEVO: Proof-of-concept of adenovirus-directed EVOlution by random peptide display on the fiber knob. (2024) *Molecular Therapy Oncology*
2. Scott S, Westhaus A, Nazareth D, **Cabanes-Creus M**, […], Lisowski L. AAVolve: Concatenated long-read deep sequencing enables whole capsid tracking during shuffled AAV library selection. (**2024**) *Mol Ther Methods Clin Dev*.
3. **Cabanes-Creus M**, SHY Liao, RG Navarro, M Knight, D Nazareth, […], L Lisowski, Harnessing whole human liver ex situ normothermic perfusion for preclinical AAV vector evaluation (**2024**). *Nature Communications*.
4. M Drouyer, TH Chu, E Labit, F Haase, RG Navarro, D Nazareth, N Rosin, J Merjane, S Scott, **Cabanes-Creus M**, […], Lisowski L. Novel AAV variants with improved tropism for human Schwann cells (**2024**) *Mol Ther Methods Clin Dev.*
5. CY Kok, S Tsurusaki, **Cabanes-Creus M,** […], Lisowski L. Development of new adeno-associated virus capsid variants for targeted gene delivery to human cardiomyocytes (**2023**) *Mol Ther Methods Clin Dev.*
6. NS Lau, M Ly, C Dennis, A Jacques, **Cabanes-Creus M**, […], Lisowski L. Long-term ex situ normothermic perfusion of human split livers for more than 1 week (**2023**). *Nature Communications*.
7. NS Lau, M Ly, C Dennis, K Ewenson, H Ly, JL Huang, **Cabanes-Creus M**, […], Liver splitting during normothermic machine perfusion: a novel method to combine the advantages of both in-situ and ex-vivo techniques. (**2023**). *HPB.*
8. Westhaus A†, **Cabanes Creus M**†, […], Alexander IE, Lisowski L. (**2023**) Assessment of pre-clinical liver models based on their ability to predict the liver-tropism of AAV vectors. *Hum Gene Therapy.*
9. **Cabanes-Creus M**, Navarro RG, Liao SHY, Scott S, Carlessi R, Roca-Pinilla R, Baltazar G, Zhu E, Jones M, Denisenko E, Forrest ARR, Alexander IE, Trinitz-Parker JEE, Lisowski L. (**2022**). Development of an AAV-LK03 variant with improved liver lobular biodistribution in the humanized FRG mouse model. *Mol Ther Methods Clin Dev.*
10. Meumann N, **Cabanes-Creus M**, […], Lisowski L, Büning H (**2022**). Novel Adeno-Associated Virus (AAV) Serotype 2 Capsid Variants for Improved Liver-Directed Gene Therapy. *Hepatology.*
11. Westhaus A†, **Cabanes-Creus M**†, Jonker T, Sallard E, Navarro RG, Zhu E, Baltazar G, Lee S, Wilmott P, Gonzaled-Cordero A, Santilli G, Thrasher AJ, Alexander IE, Lisowski L (**2022**). AAV-p40 bioengineering platform for variant selection based on transgene expression. *Human Gene Therapy.*
12. **Cabanes-Creus M**, Navarro RG, Zhu E, Baltazar G, Liao SHY, Drouyer M, Amaya KA, Scott S, Nguyen LH, Westhaus A, Hebben M, Wilson LOW, Thrasher AJ, Alexander IE, Lisowski L. (**2021**). Novel human liver-tropic AAV variants generated by capsid shuffling define transferable domains that markedly enhance the human tropism of AAV7 and AAV8. *Mol Ther Methods Clin Dev.*
13. **Cabanes-Creus M**, Navarro RG, Liao SHY, […], Lisowski L. (**2021**). Single amino acid insertion allows functional transduction of murine hepatocytes with human liver tropic capsids. *Mol Ther Methods Clin Dev.*
14. **Cabanes-Creus M,** Hallwirth CV, Westhaus A, Ng BH, Liao SHY, Zhu E, Navarro RG, Baltazar G, Drouyer M, Scott S, Logan GJ, Santilli G, Bennett A, Ginn SL, McCaughan G, Thrasher AJ, Agbandje-McKenna M, Alexander IE, Lisowski L. (**2020**). Restoring the natural tropism of AAV2 vectors for human liver. *Science Translational Medicine.*
15. **Cabanes-Creus M**, Westhaus A, Navarro RG, Baltazar G, Zhu E, Amaya AK, Liao SHY, Dilworth KL, Rybicki A, Drouyer M, Benett A, Hallwirth CV, Santilli G, Thrasher AJ, Agbandje-McKenna M, Ian E. Alexander IE, Lisowski L. (**2020**). Attenuation of the heparan sulfate proteoglycan binding enhances in vivo transduction of human hepatocytes with AAV2. *Mol Ther Methods Clin Dev.*
16. Westhaus A, **Cabanes-Creus M**, Rybicki A, Baltazar G, Navarro RG, Zhu E, Drouyer M, Knight M, Albu RF. Ng BH, Kalajdzic P, Kwiatek M, Hsu K, Santilli G, Gold W, Kramer B, Gonzalez-Cordero A, Thrasher AJ, Alexander IE, Lisowski L. (**2020**). High throughput in vitro, ex vivo and

in vivo screen of AAV vectors based on physical and functional transduction. *Human Gene Therapy.*

17. **Cabanes-Creus M**, Ginn SL, Amaya AK, […], Alexander IE, Lisowski L. (**2019**). Codon-Optimization of Wild-Type Adeno-Associated Virus Capsid Sequences Enhances DNA Family Shuffling while Conserving Functionality. *Mol Ther Methods Clin Dev*.
18. Logan GJ, Dane AP, Hallwirth CV, Smyth CM, Wilkie EE, Amaya AK, Zhu E, Khandekar N, Ginn SL, Liao S, Cunningham SC, Sasaki N, **Cabanes-Creus M**, Tam PPL, Russell DW, Lisowski L, Alexan der IE. (**2017**). Identification of liver-specific enhancer-promoter activity in the 3' UTR of AAV2. *Nature Genetics*.

† Equal contribution

SECURED FUNDING

Nov. 2022 – Nov. 2024 **Early to Mid-Career Researchers 2021 (MRFF)**

Title: Developing a promoter-less gene therapy approach for haemophilia A.
Total funds: AU$513720
Role: Principal Investigator (**Chief Investigator A**)

Nov. 2022 – Nov. 2025 **National Health and Medical Research Council (NHMRC) Ideas Grant**

Title: Bioengineering of next-generation adeno-associated viral vectors for gene therapy clinical applications using whole human liver explant preclinical model.
Total funds: AU$949508
Role: Co-principal investigator (**Chief Investigator C**)

June. 2021 – June 2024 **Early-Mid Career Gene and Cell Therapy Grants**

Title: Bioengineering of next-generation adeno-associated viral vectors for clinical applications using a whole human liver explant preclinical model.
Total funds: AU$390000
Role: **Main applicant (Chief Investigator)**

PATENTS

1. Patent Application Australia (2019362280), Europe (19874014.4), US (17/286,420). Nucleic acid molecules and methods for AAV vector selection.
2. Patent Application Australia (2020299026), Europe (20834114.9), US (17/622154). Methods and AAV vectors for in vivo transduction.
3. PCT/AU2021/050158, Taiwan (110106754). Adeno-associated virus capsid polypeptides and vectors.
4. PCT/AU2021/051497. Adeno-associated virus capsids and vectors.
5. Australia (2021902729). Modified AAV capsid polypeptides and vectors.
6. Australia (2021902737). Modified AAV capsids and vectors.

HONOURS and AWARDS

2023 Meritorious Abstract Travel Award for presenting work at the American Society of Gene and Cell Therapy.

2022 Meritorious Abstract Travel Award for presenting work at the American Society of Gene and Cell Therapy.

2020 Best Gene Therapy Paper for the Australasian Gene and Cell Therapy Society, for the paper 'Restoring the natural tropism of AAV2 vectors for human liver'

2019 Oral presentation in the Junior Investigator Session of the Australasian Gene and Cell Therapy Society Scientific Meeting held in Brisbane.

2019 Three Abstracts selected for Poster presentation at the ESGCT congress in Barcelona.

2018 Best Gene Therapy Paper for the Australasian Gene and Cell Therapy Society, for the paper 'Codon-optimization of wild-type adeno-associated virus capsid sequences enhances DNA family shuffling while conserving functionality'.

2017 NIHR Great Ormond Street Hospital BRC award 15ID16.

2017 Abstract selected for Oral presentation at the ESGCT congress in Berlin.

2017 Oral presentation in the Junior Investigator Session of the Australasian Gene and Cell Therapy Society Scientific Meeting held in Sydney.

2012 Studentship received for assisting to the I CIBICAT Global Questions on Advanced Biology in Barcelona (Spain), held at the Institut d'Estudis Catalans from 9th to the 12th of July 2012.

2010 Scholarship for Academic Excellence – Caixa Manresa.

2009 Scholarship for graduating from Highschool with Honours. Ministerio de Educación de España.

PROFESSIONAL MEMBERSHIPS

2016 – present Associate Member, European Society of Gene and Cell Therapy (ESGCT)
2016 – present Associate Member, Australasian Gene and Cell Therapy Society (AGCTS)
2019 – present Associate Member, American Society of Gene and Cell Therapy (ASGCT)