MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

CURRICULUM VITAE (maximum 4 pages)

CV date	26/08/2021

Part A. PERSONAL INFORMATION

First and Family names	Benjamí Oller Salvia		*ID number*	47733690L	*Age*	34
Researcher numbers	*ORCID*	0000-0002-8140-6111		*Socpus Author ID*	55988108100	

A.1. Current position

Name of Institution	Institut Químic de Sarrià (IQS) – Ramon Llull University		
Department	Bioengineering	*Address*	Via Augusta 390. 08017 Barcelona. Spain
Phone number	699810420	*E-mail*	benjami.oller@iqs.url.edu
Current position	Assistant Professor	*From*	21/01/2019
Espec. cod. UNESCO	230418	*Key word*	drug delivery, peptide & protein chemistry, antibody engineering, blood-brain barrier

A.2. Education

PhD in Organic Chemistry (*cum laude*) ***international mention & extraordinary, pioneer, Margalef awards***	University of Barcelona	2015
MSc in Advanced Chemistry: Organic Chemistry (*9.1/10*)	University of Barcelona	2012
5-year degree ("licenciatura") in Chemistry (*9.4/10* – ***ranked #1***) *Scholarship Academic Excellency Francesc Castelló i Aleu – 5 years*	IQS-URL	2010

A.3. Indicators

Total citations (WoS): 427, Citations/year in the last 5 years: 53. Peer-reviewed articles: 15 (14 WoS, 1 EMBASE), of which: Q1: 8, **Top 10% journals: 6, First author: 7, Corresponding author: 2**. h-index: 8 (WoS). One "Sexenio de investigación" (2019). Student supervision: **PhD: 3 current, including one FPU fellowship** awardee, MSc: 5 defended and 2 current; BSc: 8 defended and 1 current.

Part B. CV SUMMARY

I am an **assistant professor** at IQS School of Engineering - Ramon Llull University since 2019. **I lead the research program of Peptides and Proteins for Targeted Nanotherapeutics** (www.oller-salvia.com), as part of Department of Bioengineering – GEMAT. I have recently been awarded "**La Caixa" Junior Leaders fellowship** and a **"Proyecto I+D+I"** from the Ministerio de Ciencia e Innovación, which will enable me to consolidate the research program that I started with a **Marie-Sklodowska Curie Fellowship** at IQS. Together with my research team, we are **combining chemistry and synthetic biology to create novel targeted therapies, especially to treat brain diseases**. So far, we have engineered novel multicyclic peptides for brain delivery and sensitive coatings for gene therapies.

Prior to my current appointment, I held an **EMBO postdoctoral fellowship** to pursue research in Porf. Jason Chin's group at the **MRC Laboratory of Molecular Biology in Cambridge**. There I developed a **new platform to produce antibody-drug conjugates** using genetic code expansion, which has drawn considerable attention in academia and industry. I also **established a highly efficient method to encode multiple non-canonical amino acids into phage displayed proteins**. My predoctoral work, conducted in Prof. Ernest Giralt's group at **IRB Barcelona**, focused on the design of peptides for brain delivery. My main contribution was the **development of a cyclic peptidomimetic**, inspired by a component of bee venom, which is stable in serum and capable of efficiently shuttling a variety of compounds across the blood-brain barrier (BBB). In my PhD I also started a research line on **antibody-BBB-shuttles conjugates**, which has recently yielded promising results *in vivo*. Another main contribution from my PhD thesis is a highly cited review on BBB-shuttle peptides. Prior to my predoctoral work, I acquired experience in polymeric nanoparticles and the BBB with Prof. Borrós at IQS-URL and Prof. Edelman at MIT. My academic and research achievements, published in high impact articles, have been recognized with **several honors** such as the "La Caixa" Junior Leaders, MSCA-IF, EMBO and "La Caixa"/IRB Barcelona fellowships, and the Ramon Margalef and Pioner awards.

Furthermore, to me, research is not only about pushing the boundaries of knowledge but also mentoring and **educating new generations of scientists**. This is why **I lead a team of graduate and one undergraduate students, and I am currently responsible for three courses related to my research**. I hold a **lecturer accreditation** (AQU) and I am currently a board member of the Catalan Chemical Society, with which I have recently co-organized the XI Meeting of young scientists in Catalonia.

Part C. RELEVANT MERITS

C.1. Ten most relevant publications (out of 15 published articles, *corresponding author)

- Two research articles in revision and two more in preparation.
- **R Lucchi, J Bentanachs, B Oller-Salvia*. The masking game: design of activatable antibody and mimetics for selective therapeutics and cell control. *ACS Central Science*. 2021, *7*, 724-738 (IF: 14.6)**
- J L Watson, S Aich, B Oller-Salvia, A A Drabek, S C Blacklow, J Chin, E Derivery. Fibrinogen anchors enable efficient multiplexed patterning of active proteins and subcellular control of membrane-receptor distribution. J Cell Biol. 2021, *220*, e202009063 (**IF 10.5**, 2 citations)
- **B Oller-Salvia, J W Chin. Efficient phage display with multiple distinct non-canonical amino acids via orthogonal ribosome mediated genetic code expansion. *Angewandte Chemie International Edition.* 2019, *58*, 10844-10848. (IF: 13.0**, 16 citations**)**
- C Díaz-Perlas, B Oller-Salvia, M Sánchez-Navarro, M Teixidó, E Giralt. Branched BBB-shuttle peptides. Chemoselective modification of proteins to enhance blood-brain barrier transport. ***Chemical Science.* 2018**, *9*, 8409-8415. (**IF: 9.3**, 17 citations)
- B Oller-Salvia*. Genetic encoding of a cyclopropene derivative to generate antibody-drug conjugates through a rapid, site-specific, bioorthogonal reaction. ***Journal of Visualised Experiments.* 2018**, *139*, e58066 (IF 1.5, 2 citations).
- **B Oller-Salvia, G Kym, JW Chin. Rapid and efficient generation of stable antibody-drug conjugates via an encoded cyclopropene and an inverse electron demand Diels-Alder reaction. *Angewandte Chemie International Edition*. 2018, *57*, 2831-2834. (IF: 12.3, 41 citations)**
- **B Oller-Salvia, M Sánchez-Navarro, E Giralt, M Teixidó. BBB-shuttle peptides: an emerging paradigm for brain delivery. *Chemical Society Reviews*. 2016, *45*, 4690-4707. (IF 38.6, 175 citations, Inside cover)**
- **B Oller-Salvia, M Sánchez-Navarro, S Ciudad, …, E Giralt, M Teixidó. (1/11) MiniAp-4: a venom-inspired peptidomimetic for brain delivery. *Angewandte Chemie International Edition.* 2016, *55*, 572-575. (IF: 12.0, 55 citations, Hot article. Inside cover).** I contributed to conceiving the idea of the project, wrote the manuscript, designed and performed the peptide syntheses and characterization, most cell-based experiments, and designed and participated in the in vivo experiments.
- **R Prades, B Oller-Salvia, MS Schwarzmaier, …, M Teixidó, E Giralt. (2/12) Jumping hurdles: revisiting the retro-enantio approach to obtain a peptide able to overcome the blood-brain barrier. *Angewandte Chemie International Edition.* 2015, *54*, 3967-3972. (IF: 11.7, 70 citations, Featured in the Spanish press: El País and Diario Médico, among others).** I contributed the design and realization of in vivo experiments, as well as major revisions on the cell binding and internalization experiments.
- B Oller-Salvia, M Teixidó, E Giralt. From Venoms to BBB Shuttles. Synthesis and Blood-Brain Barrier Transport Assessment of Apamin and a Non-Toxic Analog. ***Biopolymers-Peptide Science.*** 2013, *100*, 675-686. (IF 2.5, **29 citations**, Front cover)

C.2. Research projects and grants

- Reference number: Proyecto **Ideas Semilla** IDEAS211057OLLE. Amount awarded: **20.000€** Title: Desarrollo de un anticuerpo activable para dirigir un nanosistema de vectorización de terapias génicas a células madre de glioma. Funding body: Asociación Española Contra el Cáncer (AECC). Start date: 01/11/2021. End date: 31/10/2023. Role: **Principal Investigator**.
- Reference number: 2021 **"Proyectos I+D+I"** Retos de Investigación PID2020-117486RA-I00. Amount awarded: **136.125€**. Title: Towards a universal strategy to generate acti-vatable antibodies and its application to target gene nanotherapies to glioma stem cells. Funding body: Ministerio de Ciencia e Innovación. Start date: 01/09/2021. End date: 31/08/2024. Role: **Principal Investigator**.
- Reference number: 2021 **"La Caixa" Postdoctoral Junior Leader** – Retaining LCF/BQ/PR21/11840002. Amount awarded: **292.500€**. Title: Development of activatable antibody mimetics for the targeted delivery of gene therapies to glioma stem cells. Funding body: "La Caixa" Foundation (co-fund with MSCA). Start date: 01/07/2021. End date: 30/06/2024. Role: **Principal Investigator**.
- Reference number: 2021-URL-Proj-028. Amount awarded: **12.000€**. Title: Desenvolupament d'un recobriment amb pèptids llançadora per transportar nanoteràpies a través de la barrera hematoencefàlica. Funding body: Unviersitat Ramon Llull. Start date: 01/01/2021. End date: 31/12/2021. Role: **Principal Investigator**.

- Reference number: **Marie Sklodowska-Curie Actions – Individual Fellowship** 844441. Amount awarded: **160.923€.** Title: Generating a targeted, brain-permeable and stable polymeric nanoparticle for systemic gene delivery to glioblastoma. Funding body: MSCA. European Commission. Start date: 01/07/2019. End date: 30/06/2021. Role: **Principal Investigator**.
- Reference number: **EMBO Long-Term Fellowship** ALTF 158-2016. Amount awarded: **60.921 GBP**. Title: Genetic encoding of phosphothreonine and its non-hydrolysable and photocaged derivatives. Funding body: European Molecular Biology Organization (EMBO). Start date: 01/02/2017. End date: 15/01/2019. Role: **Principal Investigator**.
- Reference number: PROVAT- 2011-013. Amount awarded: **614.000€.** Title: Use of peptide shuttles for the delivery of monoclonal antibodies across the blood-brain barrier in brain tumours. Funding body: Generalitat de Catalunya. PI (Institution): Joan Seoane Suárez (Vall d'Hebron Institute of Oncology). Start date: 31/12/2012. End date: 01/01/2013. Role: participant researcher.

C.3. Contract

- Title: Genetic code expansion for next generation protein therapeutics. PI: Jason W. Chin
  Funding body: MRC-LMB. Start date: 18/01/2016. End date: 31/01/2017

C.4. Patent

- E Giralt, M Teixidó, B Oller. Actively transported and protease-resistant peptides as BBB shuttles and shuttle-cargo constructs. PCT/EP2014/064173. IRB Barcelona & UB. Granted and licenced to Gate2Brain.

C.5. Ten selected conference presentations and invited lectures (out of 11 oral and 7 poster presentations, including 2 poster awards)

- *October 2021*. **Invited lecture**. **European Antibody Congress 2021, Basel, Switzerland**. Development of new protease- sensitive masked antibodies.
- *May 2021.* **Invited lecture**. Young Investigators Workshop – European Chemical Biology Symposium, Austria (online). Toward proteo- and peptide- mimetics targeting nanotherapeutics.
- *May 2020* (Postponed to June 2022 due to COVID-19 pandemic) **Invited keynote speaker. MedChem2020**, Barcelona, Spain. New trends in drug delivery.
- *November 2019.* **Invited seminar**. **Germans Trias i Pujol Research Institute**, Badalona, Spain. Protein targeted therapeutics: merging chemistry and synthetic biology to develop next generation drugs
- *October 2019*. **Invited lecture**. **European Antibody Congress 2019, Basel, Switzerland**. Efficient incorporation of non-canonical amino acids in phage display via genetic code expansion.
- *October 2018*. **Invited lecture**. **European Antibody Congress 2018, Basel, Switzerland**. Genetic encoding of a cyclopropene for the rapid and efficient generation of stable antibody conjugates.
- *November 2016*. **Invited lecture**. Masters course on Pharmaceutical Chemistry (IQS-URL), Barcelona, Spain. B. Oller-Salvia. Blood-brain barrier shuttles and the power of genetic code expansion.
- *June 2015*. **Invited lecture**. Neuromed closing workshop, Bellaterra, Spain. Development of minimized apamin derivatives for brain delivery of antibodies and other cargoes.
- *August 2014*. **European Peptide Symposium, Sofia, Bulgaria.** Bs. Oller-Salvia, M. Teixidó, E. Giralt. From venoms to blood-brain barrier shuttles. Transport assessment of apamin-inspired shuttles and conjugates. **Travel grant**.
- *June 2013*. **5th European Chemistry Conference for Life Sciences (ECCLS)**, Barcelona, Spain. B. Oller-Salvia, M. Sánchez-Navarro, M. Teixidó, E. Giralt. From venoms to BBB shuttles. Synthesis, protease stability and blood-brain barrier transport of apamin and a non-toxic analogue.

C.6. Relevant research experience

- *July 2021-present*. **"La Caixa" Junior Leader Fellow and group leader**. **IQS – URL**, Spain.
- *July 2019-June 2021*. **Marie Sklodowska-Curie Fellow and leader** of the research program on "Protein and Peptide in Targeted Nanotherapeutics". **IQS – URL**, Spain.
- *February 2017-January 2019*. European Molecular Biology Organization **(EMBO) postdoctoral fellow**. Incorporation of non-canonical amino acids into proteins of therapeutic interest using genetic code expansion. Advisor: Prof. Jason Chin's laboratory. **MRC-LMB**, UK
- *January 2016-January 2017*. **MRC Postdoctoral Scientist**. Using genetic code expansion applied to new therapeutic protein generation. Advisor: Prof. Jason Chin. **MRC-LMB,** UK

- *June 2012-June 2015*. **PhD candidate**. Thesis entitled "From bee venom to blood-brain barrier shuttles. Development of minimized apamin derivatives for brain delivery of antibodies and other cargoes". Advisors: Prof. Ernest Giralt and Dr. Meritxell Teixidó. **IRB Barcelona.**
  - *January-April 2015*. Secondment to study the cell uptake and receptor binding of fluorophore-BBB-shuttle peptide conjugates. Advisor: Prof. Kai Johnsson. **École Polytechnique Fédérale de Lausanne (EPFL)**, Switzerland. **Boehringer Ingelheim 3-month travel grant**.
  - *November 2013*. Secondment to set up a stable human BBB cell-based model derived from stem cells. Advisor: Prof. Roméo Cecchelli. **University of Artois**, France
  - *June 2012*. Secondment to learn about antibody-drug conjugation techniques. Advisor: Prof. Dario Neri. **Eidgenössische Technische Hochschule Zurich (ETH Zurich)**, Switzerland.
  - *January 2014.* Course in laboratory animal science (80h). University of Barcelona, Spain.
- *July 2010-March 2012*. MSc student. Thesis entitled "From venoms to BBB shuttles. Synthesis and blood-brain barrier transport assessment of apamin and two analogues". Advisors: Prof. Ernest Giralt and Dr. Meritxell Teixidó. **IRB Barcelona**, Spain
- *July-October 2010*. Research stage to set up a dynamic BBB cell-based model in a hollow fibre flow reactor. Advisors: Prof. Mercedes Balcells and Prof. Elazer R. Edelman. **Massachusetts Institute of Technology (MIT)**, USA. **MOBINT travel grant** (Generalitat de Catalunya)
- *October 2009-June 2010*. Part time collaboration in the European project NanoBioPharmaceutics. Advisor: Prof. Salvador Borrós. **IQS-URL**, Spain

C.7. Ten most relevant fellowships and awards (out of 16)

2021 **"La Caixa" Postodoctoral Junior Leaders fellowship** to pursue research at IQS-URL (3 years)
2019 **Marie Sklodwoska-Curie Actions - Individual fellowship** to pursue research at IQS-URL (2 years)
2018 Appointed **Fellow of the Higher Education academy (UK)**
2016 **EMBO long-term fellowship** to pursue postdoctoral research at the MRC-LMB (2 years)
2016 **Research Associate** position at Homerton college, **University of Cambridge**
2016 **Ramon Margalef** award: best research article derived from a PhD thesis - University of Barcelona
2016 **PhD thesis extraordinary prize 2016** - University of Barcelona
2015 **"Pioner 2015" prize** for PhD thesis originality and translational value - CERCA
2014 **Three-month travel grant** to pursue research at EPFL - Boehringer Ingelheim Fonds
2010 **"La Caixa"/IRB Barcelona International PhD Program Fellowship (4 years)**

C.8. Teaching experience and training

- *September 2019-present*. **Responsible for** the "Biocatalysis" course, Biotechnology degree IQS-URL.
- *February 2019-present*. **Responsible for** the "Advanced Drug Delivery" and "Biomaterials & Biomedical Applications" **master's courses at IQS-URL**.
- *November 2016-June 2018*. **Supervisor for Biochemistry and Molecular Biology (2017/2018) and Biology of Cells (2016/2017) at Homerton College, University of Cambridge**
- *2017/2018.* **Teaching Associates Programme, University of Cambridge**
- *October 2017*. **Lectureship accreditation by the "Agència de Qualitat Universitària"**
- *2013/2014*. **Co-director of the baccalaureate research work** of Martí Domènech. Award from the Barcelona Science Park for the best research work
- *January 2013*. **Course tutor** at the workshop "Crazy about biomedicine" organized by IRB Barcelona for 16/17-year-old high-school students

C.9. Leadership, editorial, reviewing, and other volunteering activities

- *2021-pres.* **Consultant** for antibody-drug conjugate and peptide therapeutics R&D and production.
- *2021-present.* **Topic and special issue editor** for the journal *Pharmaceutics*.
- *September 2019-present.* **Board member of the *Societat Catalana de Química*** and delegate at the **Young Chemical European Network. Organization of the 2020 European Young Chemist's Network** annual meeting and the **XI Meeting of young chemists**.
- *2019-present*. Evaluation juries for: PhD thesis, and MSc and BSc final degree research projects
- *September 2018.* **EMBO Lab leadership course**, Heidelberg, Germany.
- *February 2018.* **Organizer of an action station** for the Homerton 250 anniversary. Cambridge, UK
- *2015-present*. **Reviewer for several journals** from Wiley and MDPI.
- *2012-2014.* Member of the PhD Student Council at IRB Barcelona.
- *2013.* Member of the **organizing committee for the 3rd IRB PhD symposium** "The Clock of life"
- 2012 Reviewer for the program "Science & Youth" organized by Catalunya Caixa

C.10. Affiliation to societies

2019.– *European Young Chemists Network.* 2019.– *Real Sociedad Española de Química - Jóvenes Químicos Investigadores y Química Biológica.* 2019.– *Societat Catalana de Química.* 2018.– Higher Education Academy, UK. 2014.– *Sociedad Española de Bioquímica y Biología Molecular* (SEBBM, Spanish branch of FEBS). 2013.– *European Peptide Society*.