

Marine Petit, PhD Lecturer in Virology

University of Surrey,
School of Biosciences, Dept of Microbial Sciences
GU2 7HX Guildford, UK

m.petit@surrey.ac.uk

Date of Birth: 04/07/1990
Nationality: French

Education

2016 : Ph.D in Virology, Institut Pasteur, University Pierre et Marie Curie, Paris, France.

2013: M.Sc. in Fundamental Virology, Institut Pasteur, University Paris Diderot, Paris, France.

2011: B.Sc. in Biochemistry and Molecular Biology, University Paris Diderot, Paris, France.

Research experience

Lecturer in Virology: July 2023 to present day

Tick-borne virology
University of Surrey, Guildford UK.

Marie Curie Individual fellow: June 2021 to June 2023

Laboratory of Pr. Alain Kohl and Dr. Benjamin Brennan,
MRC-University of Glasgow Centre for Virus Research, Glasgow, UK
Post-doctoral project: TICKITS: Tick cell interactions with SFTS virus. A systemic approach to vector biology.

Post-doctoral training: September 2017 to February 2021

Laboratory of Dr. Priya Shah, **UC Davis**, CA, USA.
Post-doctoral project: Molecular basis of flaviviral non-structural proteins and host gene expression machinery interactions.

3^{1/2} years

PhD training: September 2013 to October 2016

Laboratory of Dr. Maria-Carla Saleh, **Institut Pasteur**, Paris, France.
Thesis project: Functional characterization of the piRNA pathway during viral infection in *Drosophila melanogaster*.

3 years

Research internship:

First Tripartite course in Bioinformatic, NGS analysis with Python/R
Organized by Dr. Magnus Fontes, Ribeirao Preto, *Brazil, Sao Paulo University*.

Sigma virus infection of *Drosophila melanogaster* wIII8 and 22a strains.
Laboratory of Prof. Frank Jiggins, *Cambridge University, Cambridge, UK*.

Dissection of *Drosophila* ovaries, immunostaining and confocal microscopy.
Laboratory of Dr. Cahir O’Kane, *Cambridge University, Cambridge, UK*.

Master 2 training: December 2012 to July 2013

Laboratory of Dr. Pierre Charneau, **Institut Pasteur**, Paris, France.
Project: Routing kinetic and nuclear import of HIV *in vitro* (study of early stage of HIV infection in cells).

6 months

Master 1 training: January 2012 to June 2012. **ERASMUS program**

Laboratory of Pr Jouko Vepsäläinen, **University of Eastern Finland**, Kuopio.
Project: R,S-g-methylspermidine (g = gamma), novel preparation strategies and biological testing.

6 months

B.Sc. training: June 2011

Laboratory of Dr Richardson, **Veterinary school of Maisons-Alfort**, France.
Project: Establishment and improvement of Adenoviral vectors for oral vaccination.

1 month

Publications

Multi-omics analysis of severe fever with thrombocytopenia syndrome virus infection in *Rhipicephalus microplus* cells reveals antiviral tick factors.

Petit M.J., Flory C, Quan G,[...] Bell-Sakyi, Scaturro P, Brennan B., Kohl A. **Preprint Research Square**, (2024). <https://doi.org/10.21203/rs.3.rs-4505289/v1>

Polyamines and eIF5A hypusination facilitate SREBP2 synthesis and cholesterol production leading to enhanced enterovirus attachment and infection.

Firpo M.R., LoMascolo N.J., **Petit M.J.**, , Shah P.S. and Mounce B.C. **Plos Pathogen**, **19** (4), e1011317, (2023). <https://doi.org/10.1371/journal.ppat.1011317>

Transcriptomic profiling implicates PAF1 in both active and repressive immune regulatory networks.

Matthew W. Kenaston, Oanh H. Pham, **Marine J. Petit**, Priya S. Shah. **BMC Genomics** 23, 787 (2022). <https://doi.org/10.1186/s12864-022-09013-6>

Nuclear Dengue virus NS5 antagonizes expression of PAF1-dependent immune response genes.

Petit M.J., Kenaston M.W., Pham O., Nagainis A.A., Fishburn A. and Shah P.S.. **Plos Pathogens**, **19** Nov. 2021. <https://doi.org/10.1371/journal.ppat.1010100>

Mapping arbovirus-vector interactions using systems biology techniques.

Petit M.J., and Shah PS. **Frontiers in cellular and infection microbiology** 8 (2019): 440. <https://doi.org/10.3389/fcimb.2018.00440>

Comparative flavivirus-host protein interaction mapping reveals mechanisms of dengue and zika virus pathogenesis.

Shah PS., Link N., Jang GM, Sharp P.P, Zhu T, Swaney D.L, Johnson J.R, Von Dollen J. , Ramage H.R, Satkamp L., Newton B., Huttenhain R., **Petit M.J.**, Baum T., Everitt A., Laufman O, Tassetto M., Shales M.,Andino R., Krogan N.J. **Cell** 175, no. 7 (2018): 1931-1945, <https://doi.org/10.1016/j.cell.2018.11.028>

piRNA pathway is not required for antiviral defense in *Drosophila melanogaster*.

Petit M., Mongelli V., Frangeul L., Blanc H., Jiggins F., Saleh M-C. **Proceeding of the National Academy of Science**, June 2016, <https://doi.org/10.1073/pnas.1607952113>

Enantiomers of 3-Methylspermidine selectively modulate deoxyhypusine synthesis and reveal important determinants for spermidine transport.

Hyvönen MT, Khomutov M, **Petit M.**, Weissel J, Kochetkov SN, Alhonen L, Vepsäläinen J, Khomutov AR, Keinänen TA. **ACS Chemical biology**, February 2015, 10.1021/cb500938e. <https://doi.org/10.1021/cb500938e>

Grant and Fellowship awarded

2024	Artist in Residencies Institute for Advanced Study, University of Surrey	£5000
2024	Harry Smith Vacation <u>Studentship</u> (UK Microbiology Society)	£48000
2023	Keystone Vector Biology symposia <u>scholarship</u>	\$1200
2021	<u>Marie-Sklodowska Curie Individual fellowship</u>	2 years (\$224,000)
2020	ASV post-doctoral <u>travel fellowship</u>	\$500
2018	Philippe Foundation <u>fellowship</u>	2 years \$6000
2013	LabeX IBEID, PhD <u>grant</u> from French government	3 years stipend

Grant and Fellowship (Submitted)

2023: Starting Grant ERC, ATIP-avenir Grant (**Selected for interview**), Royal Society Research Grants (**Waiting list**), BBSRC NIRG.
2022: L'Oreal UK Women in Science
2018: Life Science Research Foundation, Helen Hay Whitney Foundation, President's Postdoctoral Fellowship Program (UC Davis).
2017: EMBO, Human Frontiers Science Program, Life Science Research Foundation, Helen Hay Whitney Foundation, President's Postdoctoral Fellowship Program-UC Davis.

Teaching experiences

2023-2024 **Lecturer in Level 6 Molecular virology**. Student satisfaction rate of 89/100. University of Surrey, School of Biosciences.
Module lead for master's degree in Biochemistry: Research dissertation University of Surrey, School of Biosciences.

2022-2023 **Tutor for M.Sc Infection Biology Journal club** course, MRC-University of Glasgow, UK.
Guest lecture M.Sc Insect and food safety, lecture on Drosophila genetics and insect control. MRC-University of Glasgow, UK.

2015 Seminar on viral emergence for Bachelor student, Ecole National Supérieure de Paris (E.N.S Ulm), Paris, France.

2011 Physics and Chemistry tutor for High school students (Academia, France)
Teaching basic of High-school program in Physics and Chemistry.

Mentoring/Team Management

2024 **Primary supervisor of 2 PhD students, and secondary supervisor of 3 PhD students.**

2023 **Catalyst mentorship program of the University of Glasgow**

2022 **EMBO laboratory Leadership workshop**

2023-2024 Alexia Guy, Level 6 research dissertation, on SFTSV and NMD pathway.

2021-2023 Mentoring PhD student Alexandra Wilson, topic: system virology in a tick system.

2022 Master students from Glasgow University, focusing on Immunoprecipitation technique.

2019-2021 Undergraduate student researcher, Matthew Kenaston, now in Medical School.
Now junior scientist in Dr. Shah lab. 2 first author manuscripts.

2018 Supervised 3 PhD candidates during their laboratory rotation.

2017-2020 Undergraduate student researcher, mentored Ariana Nagainis (1st generation College student). Now PhD student at University of Washington, USA.

2017-2019 Undergraduate student researcher, mentored Kush Patel.

Academic service

Reviewer for PLoS publications (PLoS pathogens and PLoS One), Journal of Virology (ASV), Journal of General virology, and access microbiology.

2024 **Grant reviewing for ANR annual grant panel, and BBSRC fellowship.**

2023 **Member of RIVR** (Recently Independent Virology Researchers) network in the UK.

- 2022 Organizing committee “Pint of Science 2022”** **Glasgow, UK**
In charge of the “Our body” night. Creating the event line-up with top researchers in the fields of biology and medicine.
- External/Internal seminar committee** **CVR, UK**
In charge to organize/invite speakers to give seminar for the 2021-2022 years.
Mandate of 2 years.
- 2015 Representant of the Ph.D student in Virology (2 years)** **Institut Pasteur, France**

Membership

- 2018- present day** American Society for Tropical Medicine and Hygiene (ASTMH)
2019-present day American Society for Virology (ASV)
2021-present day Microbiology Society, UK
2023-present Biochemistry Society, UK

Science communication/Outreach

Tick and Global warming: **Surrey, UK**

How sound helps to understand the unseen?

Project in Collaboration with the sound artist Boris Allenou

Funded by the artist in residence fellowship of the University of Surrey (£5000)

WeMerryStem: Frenemies, the tick-virus relationship!

Glasgow, UK

Science afternoon for kids (5-12). Games around virus biology, protein interactions and cell infection. Designed and animated by me.

What makes virus tick? Exhibition at the Glasgow science festival

Glasgow, UK

Animation on the CVR stands. Targeted public, school pupils from Glasgow.

Focus on tick biology and tick surveillance.

La bio au labo

France

Science communication on Twitter/Instagram/Facebook

Story telling on a week on Laboratory works including Science and Education.

<http://labioaulabo.tumblr.com/post/170144925624/marine-petit-post-doctorante-en-virologie>

Skype a scientist

Worldwide

Sign up as a scientist to present my scientific work to students. In French and English. With an emphasis on the role of women and 1st generation Higher Education.

Skills

Biostatistic/visualization

R / Inkscape

Programming

Shell/Python/R/SQLite

Languages

French (native)/English (Fluent)

Others

Cross-stitching/Photography/

Cellist (symphonic orchestra (2011-2021), Music Conservatory of Paris region (1998-2008))

International and National meetings

2023

JGV Road Show meeting

Guildford, UK

Selected speaker: Unravelling tick-Bunyavirus interactions

	Microbiology Society annual meeting	Birmingham UK
	<u>Invited speaker:</u> Cellular dynamics of Dabie bandavirus infection in <i>R. microplus</i>	
	Glasgow Virology Workshop	Glasgow, UK
	<u>Invited speaker:</u> Cellular dynamics of Dabie bandavirus infection in <i>R. microplus</i> .	
	Keystone Vector biology symposia	Colorado, USA
	<u>Poster:</u> Cellular dynamics of Dabie bandavirus infection in <i>R. microplus</i> .	
2022	Bunyavirus 2022	Cambridge, UK
	<u>Poster:</u> Learning from genes: a transcriptomic approach to bunyavirus-tick cell interactions	
	Tick and tick diseases French society annual meeting	Nancy, France
	<u>Invited Speaker:</u> Learning from genes: a transcriptomic approach to bunyavirus-tick cell interactions	
2020	American Society of Virology (ASV 2020) annual meeting	Virtual meeting
	<u>Invited Speaker:</u> Understanding flavivirus NS5 antagonism of innate immunity	
2019	Gordon Research Seminar: Viruses and Cells	Barga, Italy
	<u>Invited Speaker and discussion leader:</u> Women in Science	
	Gordon Research Seminar: Viruses and Cells	Barga, Italy
	<u>Invited Speaker:</u> Understanding flavivirus NS5 antagonism of innate immunity in human systems	
	QBI Arthropod-borne disease Symposium	UC San Francisco, CA
	<u>Poster:</u> Understanding flavivirus NS5 antagonism of innate immunity in human systems	
	Bay viro 9th symposium	UC Berkeley, CA
	<u>Poster:</u> Understanding flavivirus NS5 antagonism of innate immunity in human systems	
2018	American Society for Tropical Medicine and Hygiene annual meeting	New-Orleans, USA
	<u>Poster:</u> Molecular basis of Non-structural flavivirus proteins and host-gene expression machinery interactions.	
2016	EMBO workshop: piRNAs meeting	Montpellier, France
	<u>Selected talk:</u> Characterization of the piRNA pathway during viral infection in <i>Drosophila melanogaster</i> .	
	Microsymposium small RNA (EMBL)	Vienna, Austria
	<u>Poster:</u> Do piRNAs contribute to the RNAi mediated antiviral response in <i>Drosophila melanogaster</i> ?	

Invited Speaker

2024	Surrey, UK
	“Decoding the antiviral response of ticks: a multi-omics exploration of tick-borne Bunyavirus infection in tick cells”
	Invitation to the Pirbright Institute, by Seminar committee
2022	Liverpool, UK
	“Cellular dynamics of the tick-borne <i>Dabie bandaviru</i> infection in <i>R. microplus</i> .”
	Invitation to Liverpool School of Tropical Medicine (LSTM), by Dr. Grant Hughes.
	Montpellier, France
	“Cellular dynamics of the tick-borne <i>Dabie bandavirus</i> infection in <i>Rhipicephalus microplus</i> .”
	Invitation to Laboratory of Pathogens-Host Interactions (LPHI), by Dr. Georges Lutfalla.

Montpellier, France

“Learning from the genes: a transcriptomic approach to bunyavirus-tick cell interaction”

Invitation to IRD-CNRS MIVEGEC unit, by Dr. Julien Pompon.

2019

Strasbourg, France

“Understanding flavivirus NS5 antagonism of innate immunity in human systems”

Invitation to the University of Strasbourg/CNRS unit M3I, by Dr. Joao Marques and Dr. Jean-Luc Imler.