

Sarah TEMMAM

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Virologist specialized in emerging viruses

Summary

I am interested in the study of different models of viral emergence at the animal/human interface that could influence global health. I completed a MSC in Biotechnologies and worked for several years in the field of emerging viruses before starting a PhD in Infectious Diseases. I completed my education with a post-doctoral fellowship that aimed at identifying, among the metavirome of reservoirs and vectors, which viruses are silently crossing the species barrier to infect exposed human populations; to finally better understand the mechanisms of viral emergence and explain why some viruses are able to cross the species barrier and other not, which routes of transmission are more favorable, which characteristics could explain the switch from localized spillover hosts to a pandemic diffusion of the virus and why many others are simply dead-end infections.

Keywords

Emerging viruses, One health, spillover, viral metagenomics.

Positions

Apr. 2021 – present	Research scientist , Pathogen Discovery Laboratory, Institut Pasteur (Paris, France)
2016 – Mar. 2021	Post-doctoral fellow , Pathogen Discovery Laboratory, Institut Pasteur (Paris, France)
2013 – 2016	PhD student & research engineer , Unité de Recherche sur les Maladies Infectieuses Tropicales Emergentes – Aix-Marseille University (Marseille, France)
2009 – 2012	Research engineer , Centre de Recherche et de Veille sur les maladies émergentes dans l'Océan Indien (Reunion island)
2007 – 2009	Research engineer , French Agency for Food, Environmental and Occupational Health & Safety (Maisons-Alfort, France)
2005 – 2007	Research engineer , Emerging Viral Diseases unit, IRD (Marseille, France)

Experiences

- **Pathogen Discovery Laboratory**: identification of potential zoonotic viruses among metaviromes of mammalian reservoirs and arthropod vectors by high throughput sequencing and serological techniques.
- **“Unité de Recherche sur les Maladies Infectieuses Tropicales Emergentes”**: Characterization of viral communities of vectors and animal reservoirs of zoonoses in Senegal by metagenomics.
- **“Centre de Recherche et de Veille sur les maladies émergentes dans l'Océan Indien”**: Inventory of viral infectious agents present in wildlife and their associated ectoparasites from islands of the South-West Indian Ocean. Characterization of pandemic *Influenza A/H1N1* and other respiratory viruses in human and swine.
- **French Agency for Food, Environmental and Occupational Health & Safety**: Development and validation of techniques to detect viruses from foodstuffs. Development of virucide treatments applicable for food industry.
- **Emerging Viral Diseases unit**: Development and validation of diagnostic tools for viruses. Viral isolation and identification of emerging viruses in arthropods.

Education

2013 – 2016	PhD in Infectious Diseases Aix-Marseille University (Marseille, France)
2014 (1 week)	Thematic school VIR2OMIQUES (CNRS, Clermont-Ferrand, France)
2013 – 2014	Graduate certificate in Medical Entomology , Aix-Marseille University (Marseille, France)
2002 – 2005	Engineer in Biotechnologies Compiègne University of Technology (Compiègne, France)

Scientific production during the 5 last years

Selected publications

- Fontanet A, Tondeur L, Grant R, TEMMAM S, Madec Y, Bigot T, Grzelak L, Cailleau I, Besombes C, Ungeheuer MN, Renaudat C, Perlaza BL, Arowas L, Jolly N, Pellerin SF, Kuhmel L, Staropoli I, Huon C, Chen KY, Crescenzo-Chaigne B, Munier S, Charneau P, Demeret C, Bruel T, Eloit M, Schwartz O, Hoen B. **SARS-CoV-2 infection in schools in a northern French city : a retrospective serological cohort study in an area of high transmission, France, January to April 2020**. Euro Surveill. 2021 Apr;26(15):2001695.
- Bratuleanu BE, TEMMAM S, Chrétien D, Regnault B, Pérot P, Bouchier C, Bigot T, Savuța G, Eloit M. **The virome of *Rhipicephalus*, *Dermacentor* and *Haemaphysalis* ticks from Eastern Romania includes novel viruses with potential relevance for public health**. Transbound Emerg Dis. 2021 Apr 11.
- Sermet-Gaudelus I, TEMMAM S (co-1st), Huon C, Behillil S, Gajdos V, Bigot T, Lurier T, Chrétien D, Backovic M, Delaunay-Moisan A, Donati F, Albert M, Foucaud E, Mesplées B, Benoist G, Faye A, Duval-Arnould M, Cretolle C, Charbit M, Aubart M, Auriou J, Lorrot M, Kariyawasam D, Fertitta L, Orliaguet G, Pigneur B, Bader-Meunier B, Briand C, Enouf V, Toubiana J, Guillemintot T, van der Werf S, Leruez-Ville M, Eloit M. **Prior infection by seasonal coronaviruses, as assessed by serology, does not prevent SARS-CoV-2 infection and disease in children, France, April to June 2020**. Euro Surveill. 2021 Apr;26(13):2001782.
- Regnault B, Bigot T, Ma L, Pérot P, TEMMAM S, Eloit M. **Deep Impact of Random Amplification and Library Construction Methods on Viral Metagenomics Results**. Viruses. 2021 Feb 7;13(2):253.
- Berteloot L, Berthaud R, TEMMAM S, Lozach C, Zanelli E, Blanc T, Heloury Y, Capito C, Chardot C, Sarnacki S, Garcelon N, Lacaille F, Charbit M, Pastural M, Rabant M, Boddaert N, Leruez-Ville M, Eloit M, Sermet-Gaudelus I, Dehoux L, Boyer O. **Arterial abnormalities identified in kidneys transplanted into children during the COVID-19 pandemic**. Am J Transplant. 2021 May;21(5):1937-1943.
- TEMMAM S, Barbarino A, Maso D, Behillil S, Enouf V, Huon C, Jarraud A, Chevallier L, Backovic M, Pérot P, Verwaerde P, Tiret L, van der Werf S, Eloit M. **Absence of SARS-CoV-2 infection in cats and dogs in close contact with a cluster of COVID-19 patients in a veterinary campus**. One Health. 2020 Dec;10:100164.
- Grzelak L, TEMMAM S (co-1st), Planchais C, Demeret C, Tondeur L, Huon C, Guivel-Benhassine F, Staropoli I, Chazal M, Dufloo J, Planas D, Buchrieser J, Rajah MM, Robinot R, Porrot F, Albert M, Chen KY, Crescenzo-Chaigne B, Donati F, Anna F, Souque P, Gransagne M, Bellalou J, Nowakowski M, Backovic M, Bouadma L, Le Fevre L, Le Hingrat Q, Descamps D, Pourbaix A, Laouénan C, Ghosn J, Yazdanpanah Y, Besombes C, Jolly N, Pellerin-Fernandes S, Cheny O, Ungeheuer MN, Mellon G, Morel P, Rolland S, Rey FA, Behillil S, Enouf V, Lemaitre A, Créach MA, Petres S, Escriou N, Charneau P, Fontanet A, Hoen B, Bruel T, Eloit M, Mouquet H, Schwartz O, van der Werf S. **A comparison of four serological assays for detecting anti-SARS-CoV-2 antibodies in human serum samples from different populations**. Sci Transl Med. 2020 Sep 2;12(559):eabc3103.
- Birnberg L, TEMMAM S, Aranda C, Correa-Fiz F, Talavera S, Bigot T, Eloit M, Busquets N. **Viromics on Honey-Baited FTA Cards as a New Tool for the Detection of Circulating Viruses in Mosquitoes**. Viruses. 2020 Feb 29;12(3):274.
- Gondard M, TEMMAM S, Devillers E, Pinarello V, Bigot T, Chrétien D, Aprelon R, Vayssier-Taussat M, Albina E, Eloit M, Moutailler S. **RNA Viruses of *Amblyomma variegatum* and *Rhipicephalus microplus* and Cattle Susceptibility in the French Antilles**. Viruses. 2020 Jan 26;12(2):144.
- TEMMAM S, Hul V, Bigot T, Bessaud M, Chrétien D, Hoem T, Gorman C, Duong V, Dussart P, Cappelle J, Eloit M. **Whole genome sequencing and phylogenetic characterization of a novel bat-associated picornavirus-like virus with an unusual genome organization**. Infect Genet Evol. 2020 Mar;78:104130.
- TEMMAM S, Chrétien D, Bigot T, Dufour E, Petres S, Desquesnes M, Devillers E, Dumarest M, Yousfi L, Jittapalapong S, Karnchanabanthoeng A, Chaisiri K, Gagnieur L, Cosson JF, Vayssier-Taussat M, Morand S, Moutailler S, Eloit M. **Monitoring silent spillovers before emergence: a pilot study at the tick/human interface in Thailand**. Front Microbiol. 2019 Oct 17;10:2315.

- TEMMAM S, Bigot T, Chrétien D, Gondard M, Pérot P, Pommelet V, Dufour E, Petres S, Devillers E, Hoem T, Pinarello V, Hul V, Vongphayloth K, Hertz JC, Loiseau I, Dumarest M, Duong V, Vayssier-Taussat M, Grandadam M, Albina E, Dussart P, Moutailler S, Cappelle J, Brey PT, Eloit M. **Insights into Jingmenviruses host range, genetic diversity and geographical distribution**. mSphere. 2019 Nov 6;4(6). pii: e00645-19.
- Bigot T, TEMMAM S, Pérot P, Eloit M. **RVDB-prot, a reference viral protein database and its HMM profiles**. F1000Res. 2019 Apr 23;8:530.

Selected communications

- TEMMAM S. Tracking unknown viruses and zoonotic spillovers at interfaces between humans and vectors or reservoirs. LabEx IBEID annual meeting, Institut Pasteur Paris, septembre 2019.
- TEMMAM S, Bigot T, Petres S, Desquesnes M, Chrétien D, Devillers E, Yousfi L, Cosson JF, Vayssier-Taussat M, Morand S, Moutailler S, Eloit M. One step beyond metaviromics: study of a ticks-human interface in Thailand by wide range detection techniques. Club Viro, Institut Pasteur Paris, mars 2019.
- TEMMAM S, Bigot T, Petres S, Desquesnes M, Chrétien D, Devillers E, Yousfi L, Cosson JF, Vayssier-Taussat M, Morand S, Moutailler S, Eloit M. Identification de virus à potentiel zoonotiques : application à la caractérisation de l'interface tique/homme en Thaïlande. Journées Francophones de Virologie, Lyon mars 2019.
- TEMMAM S, Bigot T, Pérot P, Gondard M, Gorman C, Chrétien D, Devillers E, Hoem T, Pinarello V, Hul V, Vongphayloth K, Petres S, Duong V, Grandadam M, Albina E, Vayssier-Taussat M, Dussart P, Moutailler S, Cappelle J, Brey P, Eloit M. De nouveaux Flaviviridae segmentés avec une répartition mondiale infectent un large spectre d'hôtes vertébrés et arthropodes. Poster, Journées Francophones de Virologie, Lyon mars 2019.
- TEMMAM S, Chrétien D, Bigot T, Petres S, Pérot P, Dumarest M, Ramirez M, Gagnieur L, Gondard M, Devillers E, Yousfi L, Cosson JF, Gorman C, Cappelle J, Duong V, Héraud JM, Moutailler S, Albina E, Morand S, Grandadam M, Dussard P, Brey PT, Vayssier-Taussat M, Eloit M. Wide range detection of arbovirus spillovers. Pasteur BCI retreat, Institut Pasteur Paris, octobre 2018.

Additional qualifications

Funding	Participation to the writing of proposals for regional, national and international calls (CRVOI: TAAF 2010, PHRC 2011, ANR 2012; Institut Pasteur: Inception 2018, PTR 2019, NIH 2019).
Supervision	Technicians, assistant researchers, MSC students interships.
Lab skills	Virology, cellular and molecular biology, OMICS sciences (NGS). Habilitation for BSL-3 manipulations for 14 years. BSL-3 lab manager (CRVOI, Reunion island).
Computer skills	Bioinformatics for sequences and metagenomics analyses, phylogenetic analyses.

Contacts former labs

- Pr. Marc ELOIT, leader of the Pathogen Discovery Laboratory, Institut Pasteur. Tel : 33 (0) 1 44 38 92 16 ; mail : marc.eloit@pasteur.fr
- Dr. Christelle DESNUES, leader of the Pathovirome team, Unité de recherche sur les Maladies Infectieuses et Tropicales Emergentes (URMITE). Tel : 33 (0) 4 91 32 46 30 ; mail : christelle.desnues@univ-amu.fr
- Pr. Koussay DELLAGI, former director at Centre de Recherche et de Veille sur les maladies émergentes dans l'Océan Indien (CRVOI), now in Institut Pasteur. Tel : 33 (0) 1 45 68 85 31 ; mail : koussay.dellagi@pasteur.fr
- Pr. Xavier de LAMBALLERIE, head of the Unité des Virus Emergents – Emergence des Pathologies Virales (UVE – EPV IRD190). Tel : 33 (0) 4 91 32 44 20 ; mail : xavier.de-lamballerie@univ-amu.fr