BIOGRAPHICAL SKETCH

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NAME: CHARREL, Remi Noel

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POSITION TITLE: Professor of Virology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Aix-Marseille II, Marseille, France	Baccalaureate	06/1983	Life Sciences
University of Aix-Marseille II, Marseille, France	M.D.	05/1991	Medical Biology
University of Texas Medical Branch, Galveston, TX	Post-doc	10/1997-12/1999	Virology
Université de la Méditerranée, Marseille, France	Ph.D.	03/1999	Virology
Université de la Méditerranée, Marseille, France	Associate Professor	09/1999	Virology
Université de la Méditerranée, Marseille, France	HDR*	06/2007	Virology
Aix-Marseille Université, Marseille, France	Professor	09/2012	Virology

*, accreditation for supervising students, researchers, and scientific projects

A. Personal Statement

Remi Charrel is MD and PhD. He is a specialist in vector-borne and zoonotic viral diseases, as well as respiratory viral infections. He was trained in Aix Marseille Medical School and went for 2 years for postdoctoral fellowship in the WHO Reference Centre for Tropical Diseases at University of Texas Medical Branch at Galveston, Texas. He is the author of >350 peer-reviewed articles, 24 book chapters, and was coordinator or PI for 24 projects funded by NIH, European Commission, the French Research Agency and Industry companies. For 10 years, he was in charge of Molecular Diagnostics in the Clinical Microbiology Laboratory serving all Public Hospitals in Marseille. He has spent 12 months as visiting professor at the Emerging Pathogens Institute, at the University of Florida, Gainesville, USA.
He has now be appointed Head of the Nosocomial Infection Control Committee.
He is the deputy director the "Unite des Virus Emergents" (Unit of Emerging Viruses) at Aix Marseille University where he supervises Preparedness and Response activities against Emerging viruses.

B. Positions and Honors

Positions and Employment

1989 to 1993 Intern in Medicine (equivalent to Intern and Resident), speciality Medical Biology, University of Aix-Marseille II, School of Medicine, Marseille, France.

1993 to 1995 Assistant Hospitalier-Universitaire (equivalent to Assistant Professor), Laboratory of Bacteriology and Hygien, Salvator Hospital, Marseille, France.

1995 to 1997 Assistant Hospitalier-Universitaire, Laboratory of Virology, La Timone Hospital, Marseille, France

1997 to 1999 **Visitor Scientist (Post-doctoral position) in the Center for Tropical Diseases of University or Texas Medical Branch, Galveston, Texas.**

1999 to 2011 Maitre de Conférences des Universités – Praticien Hospitalier (equivalent to Associate Professor), Laboratory of Virology, La Timone Hospital, Marseille, France & Laboratory of Emerging Viruses, Faculty of Medicine, Marseille, France.

2004 to 2010 Member of the Scientific Council of the BSL-4 laboratory in Lyon

2004 to 2008	Scientific advisor appointed by EU for FP6 project on Bioterrorism countermeasures
2008 to 2011	Head of the research team "characterization and control of emerging viral diseases at UMR190
2009-2017	Head of the molecular diagnostic virus platform in the clinical microbiology laboratory
Since 2012	Full Professor, Virology **Deputy-head of the "Unité des Virus Emergents", School of Medicine, Aix Marseille University, Marseille, France.**
2015-2017	Distinguished Adjunct Professor, King Abdulaziz University, Jeddah, Saudi Arabia
Jul2018-Jul2019	**Visiting Professor at Emerging Pathogens Institute, Univ of Florida, Gainesville**
Since Oct 2020	**Head** of Nosocomial Infection Control Committee at the Public Hospitals System of Marseille, France
Since Dec 2020	**Medical referral** for the COVID-19 vaccination program of the Hospital Medical Commission at the Public Hospitals System of Marseille, France.

Other Experience and Professional Memberships

2000	Member of the Peer Review Board of COLCIENCIAS Programa Nacional de Ciencia y Technologia de la Salud, Santafe de Bogota, COLOMBIA.
2001	American Society of Tropical Medicine and Hygiene: 50th Annual Meeting, Atlanta, GA: Chairman of the symposium entitled "Recombination in RNA viruses: role in emerging diseases".
Since 2008	member of the Bunyavirales Study Group at ICTV
Since 2008	Scientific Board of *Clinical Microbiology and Infection*
Since 2013	Associate editor for *PLoS Negl Trop Dis*
Since 2015	Associate editor for *Frontiers in Microbiology*
2019	Guest Editor for *Viruses (Basel)*
2021	Associate Editor for *Frontiers in Virology*
2021	Section Editor and Associate Editor for *Viruses*

Honors

1998-1999	funded by the Ministry of Foreign Affairs (Lavoisier grant) for post-doc in Texas
1999	American Society of Tropical Medicine and Hygiene Travel Award for the 48th ASTMH Meeting in Washington DC
2009-2012	Excellence Award in Scientific Research, Université de la Méditerranée, Marseille
2014-2018	Excellence Award in Scientific Research, Université d'Aix-Marseille, Marseille

C. Contribution to Science

1. Research records in the field of arboviruses and zoonotic viruses

Dr Charrel has been working with these arboviruses since 1999 when he started his post-doc fellowship under the supervision of Pr Robert E. Shope and Pr Robert B. Tesh in the World Reference Center for Arboviruses at Univ of Texas Medical Branch at Galveston, TX. Epidemics that broke in 2006, 20013, and 2015 have fueled his research activities in this domain. He has been involved in the management at local, national and international levels of the epidemics. He has published 161 articles on arboviruses. Together with Dr Xavier de Lamballerie, the head of the laboratory, he has coordinated / participated as PI in >15 EU-funded projects, a majority of which were focusing on arboviruses. Dr Charrel is ranking 15 for publication records during the 1999-2019 period using keyword "*arthropod-borne virus*" (Web of Science).

- Le Hir A, Durand GA, Boucraut J, Garnier A, Mura M, Diamantis S, Carles M, Durand C, Schweitzer C, Audouard C, Decroix V, Boyez R, Van Dendriessche A, Leclancher A, Kaphan E, du Closel LB, Verdon R, du Cheyron D, Vabret A, Vergnon D, Grard G, **Charrel R**, de Lamballerie X, Eldin C. Yellow fever vaccine-associated neurologic and viscerotropic disease: a 10-year case series of the French National Reference Center for arboviruses with clinical and immunological insights. J Travel Med. 2023 Dec 20:taad160. doi: 10.1093/jtm/taad160.

- Elbadry MA, Efstathion CA, Qualls WA, Tagliamonte MS, Alam MM, Khan MSR, Ryan SJ, Xue RD, **Charrel RN**, Bangonan L, Salemi M, Ayhan N, Lednicky JA, Morris JG. Diversity and Genetic Reassortment of Keystone Virus in Mosquito Populations in Florida. Am J Trop Med Hyg. 2023 May 1;108(6):1256-1263. doi: 10.4269/ajtmh.22-0594.
- Colmant AMG, **Charrel RN**, Coutard B. Jingmenviruses: Ubiquitous, understudied, segmented flavi-like viruses. Front Microbiol. 2022 Oct 10;13:997058. doi: 10.3389/fmicb.2022.997058.
- Ayhan N, Hachid A, Thirion L, Benallal KE, Pezzi L, Khardine FA, Benbetka C, Benbetka S, Harrat Z, **Charrel R**. Detection and Isolation of Sindbis Virus from Field Collected Mosquitoes in Timimoun, Algeria. Viruses. 2022 Apr 25;14(5):894. doi: 10.3390/v14050894.
- Capai L, Piorkowski G, Maestrini O, Casabianca F, Masse S, de Lamballerie X, **Charrel RN**, Falchi A. Detection of porcine enteric viruses (Kobuvirus, Mamastrovirus and Sapelovirus) in domestic pigs in Corsica, France. PLoS One. 2022 Jan 14;17(1):e0260161. doi: 10.1371/journal.pone.0260161.
- **Charrel RN**, Leparc-Goffart I, Pas S, de Lamballerie X, Koopmans M, Reusken C. Background review for diagnostic test development for Zika virus infection. Bull World Health Organ. 2016 Aug 1;94(8):574-584D.
- Gallian P, de Lamballerie X, Salez N, Piorkowski G, Richard P, Paturel L, Djoudi R, Leparc-Goffart I, Tiberghien P, Chiaroni J, **Charrel RN**. Prospective detection of chikungunya virus in blood donors, Caribbean 2014. Blood. 2014 Jun;123(23):3679-81. Erratum in: Blood. 2014 Sep 4;124(10):1695.
- **Charrel RN**, de Lamballerie X, Raoult D. Seasonality of mosquitoes and chikungunya in Italy. Lancet Infect Dis. 2008 Jan;8(1):5-6.
- **Charrel RN**, de Lamballerie X, Raoult D. Chikungunya outbreaks--the globalization of vectorborne diseases. N Engl J Med. 2007 Feb 22;356(8):769-71.

2. Research records in the field of Preparedness and Response to the Emerging Infectious diseases

- Luciani L, Inchauste L, Ferraris O, **Charrel R**, Nougairède A, Piorkowski G, Peyrefitte C, Bertagnoli S, de Lamballerie X, Priet S. Author Correction: A novel and sensitive real-time PCR system for universal detection of poxviruses. Sci Rep. 2022 Apr 8;12(1):5961. doi: 10.1038/s41598-022-09876-5. Erratum for: Sci Rep. 2021 Jan 19;11(1):1798.
- Sett S, Dos Santos Ribeiro C, Prat C, Haringhuizen G; European Virus Archive principal investigators; Scholz AH. Access and benefit-sharing by the European Virus Archive in response to COVID-19. Lancet Microbe. 2022 Apr;3(4):e316-e323. doi: 10.1016/S2666-5247(21)00211-1.
- Thirion L, Pezzi L, Pedrosa-Corral I, Sanbonmatsu-Gamez S, de Lamballerie X, Falchi A, Perez-Ruiz M, **Charrel RN**. Evaluation of a Trio Toscana Virus Real-Time RT-PCR Assay Targeting Three Genomic Regions within Nucleoprotein Gene. Pathogens. 2021 Feb 24;10(3):254. doi: 10.3390/pathogens10030254.
- Thirion L, Pezzi L, Corcostegui I, Dubot-Pérès A, Falchi A, de Lamballerie X, **Charrel RN**. Development and Evaluation of a Duo Chikungunya Virus Real-Time RT-PCR Assay Targeting Two Regions within the Genome. Viruses. 2019 Aug 15;11(8). pii: E755. doi: 10.3390/v11080755.
- Thirion L, **Charrel RN**, Boehmann Y, Corcostegui I, Raoul H, de Lamballerie X. Development and Evaluation of a Duo Zaire ebolavirus Real-Time RT-PCR Assay Targeting Two Regions within the Genome. Microorganisms. 2019 Dec 4;7(12). pii: E652. doi: 10.3390/microorganisms7120652.
- Reusken C, Baronti C, Mögling R, Papa A, Leitmeyer K, **Charrel RN**. Toscana, West Nile, Usutu and tick-borne encephalitis viruses: external quality assessment for molecular detection of emerging neurotropic viruses in Europe, 2017. Euro Surveill. 2019 Dec;24(50). doi: 10.2807/1560-7917.ES.2019.24.50.1900051.
- Thirion L, Dubot-Peres A, Pezzi L, Corcostegui I, Touinssi M, de Lamballerie X, **Charrel RN**. Lyophilized Matrix Containing Ready-to-Use Primers and Probe Solution for Standardization of Real-Time PCR and RT-qPCR Diagnostics in Virology. Viruses. 2020 Jan 30;12(2). pii: E159. doi: 10.3390/v12020159.
- Reusken CBEM, Broberg EK, Haagmans B, Meijer A, Corman VM, Papa A, **Charrel R**, Drosten C, Koopmans M, Leitmeyer K, On Behalf Of Evd-LabNet And Erli-Net. Laboratory readiness and response for novel coronavirus (2019-nCoV) in expert laboratories in 30 EU/EEA countries, January 2020. Euro Surveill. 2020 Feb 13. doi: 10.2807/1560-7917.ES.2020.25.6.2000082.

- Mögling R, Meijer A, Berginc N, Bruisten S, **Charrel R**, Coutard B, Eckerle I, Enouf V, Hungnes O, Korukluoglu G, Kossyvakis T, Mentis A, Molenkamp R, Muradrasoli S, Papa A, Pigny F, Thirion L, van der Werf S, Reusken C. Delayed Laboratory Response to COVID-19 Caused by Molecular Diagnostic Contamination. Emerg Infect Dis. 2020 May 20;26(8). doi: 10.3201/eid2608.201843.
- Pezzi L, **Charrel RN**, Ninove L, Nougairede A, Molle G, Coutard B, Durand G, Leparc-Goffart I, de Lamballerie X, Thirion L. Development and Evaluation of a duo SARS-CoV-2 RT-qPCR Assay Combining Two Assays Approved by the World Health Organization Targeting the Envelope and the RNA-Dependant RNA Polymerase (RdRp) Coding Regions. Viruses. 2020 Jun 25;12(6):E686. doi: 10.3390/v12060686.
- Coutard B, Romette JL, Miyauchi K, **Charrel R**, Prat CMA; EVA Zika Workgroup, EVA COVID-19 Workgroup. The Importance of Biobanking for Response to Pandemics Caused by Emerging Viruses: The European Virus Archive As an Observatory of the Global Response to the Zika Virus and COVID-19 Crisis. Biopreserv Biobank. 2020 Dec;18(6):561-569. doi: 10.1089/bio.2020.0119.

3. Research records in the field of viruses transmitted by sand flies and their medical impact

Dr Charrel has been working with Toscana virus since 2003 nad has acquired a good expertise in all the fields related with arboviruses transmitted by sand flies at the ecological, entomological, epidemiological, and virological levels. He has been leading the group of "*sandfly-borne viruses*" in several EU-funded projects such as ENIVD and EVDLabNet. Dr Charrel is ranking at the first position for publication records using keywords "*Toscana virus*", "*Phlebovirus*", and "*sand fly virus*" (Web of Science).

- Al-Numaani SA, Al-Nemari AT, El-Kafrawy SA, Hassan AM, Tolah AM, Alghanmi M, Zawawi A, Masri BE, Hindawi SI, Alandijany TA, Bajrai LH, Bukhari A, Mahmoud AB, Al Salem WS, Algaissi A, **Charrel RN**, Azhar EI, Hashem AM. Seroprevalence of Toscana and sandfly fever Sicilian viruses in humans and livestock animals from western Saudi Arabia. One Health. 2023 Jul 11;17:100601. doi:10.1016/j.onehlt.2023.100601.
- Laroche L, Ayhan N, **Charrel R**, Bañuls AL, Prudhomme J. Persistence of Toscana virus in sugar and blood meals of phlebotomine sand flies: epidemiological and experimental consequences. Sci Rep. 2023 Apr 5;13(1):5608. doi: 10.1038/s41598-023-32431-9.
- Ayhan N, Rodríguez-Teijeiro JD, López-Roig M, Vinyoles D, Ferreres JA, Monastiri A, **Charrel R**, Serra-Cobo J. High rates of antibodies against Toscana and Sicilian phleboviruses in common quail *Coturnix coturnix* birds. Front Microbiol. 2023 Jan 4;13:1091908. doi: 10.3389/fmicb.2022.1091908.
- Ortuño M, Muñoz C, Spitzová T, Sumova P, Iborra MA, Pérez-Cutillas P, Ayhan N, **Charrel RN**, Volf P, Berriatua E. Exposure to Phlebotomus perniciosus sandfly vectors is positively associated with Toscana virus and Leishmania infantum infection in human blood donors in Murcia Region, southeast Spain. Transbound Emerg Dis. 2022 Sep;69(5):e1854-e1864. doi: 10.1111/tbed.14520.
- Laroche L, Jourdain F, Ayhan N, Bañuls AL, **Charrel R**, Prudhomme J. Incubation Period for Neuroinvasive Toscana Virus Infections. Emerg Infect Dis. 2021 Dec;27(12):3147-3150. doi: 10.3201/eid2712.203172.
- Ayhan N, Alten B, Ivovic V, Cvetkovikj A, Stefanovska J, Martinkovic F, Piorkowski G, Moureau G, Gould EA, Pettersson JH, de Lamballerie X, **Charrel RN**. Field surveys in Croatia and North Macedonia reveal two novel phleboviruses circulating in sandflies. J Gen Virol. 2021 Nov;102(11). doi:10.1099/jgv.0.001674.
- Alkan C, Moin Vaziri V, Ayhan N, Badakhshan M, Bichaud L, Rahbarian N, Javadian EA, Alten B, de Lamballerie X, **Charrel RN**. Isolation and sequencing of Dashli virus, a novel Sicilian-like virus in sandflies from Iran; genetic and phylogenetic evidence for the creation of one novel species within the Phlebovirus genus in the Phenuiviridae family. PLoS Negl Trop Dis. 2017 Dec 27;11(12):e0005978.
- Alkan C, Alwassouf S, Piorkowski G, Bichaud L, Tezcan S, Dincer E, Ergunay K, Ozbel Y, Alten B, de Lamballerie X, **Charrel RN**. Isolation, genetic characterization, and seroprevalence of Adana virus, a novel phlebovirus belonging to the Salehabad virus complex, in Turkey. J Virol. 2015;89(8):4080-91.
- Ergunay K, Ayhan N, **Charrel RN**. Novel and emergent sandfly-borne phleboviruses in Asia Minor: a systematic review. Rev Med Virol. 2017 Mar;27(2).

- Sakhria S, Bichaud L, Mensi M, Salez N, Dachraoui K, Thirion L, Cherni S, Chelbi I, De Lamballerie X, Zhioua E, **Charrel RN**. Co-circulation of Toscana virus and Punique virus in northern Tunisia: a microneutralisation-based seroprevalence study. PLoS Negl Trop Dis. 2013 Sep 12;7(9):e2429.

4. Research records in the field of Rift Valley Fever, Crimean Congo haemorrhagic fever

Dr Charrel has been working for 15 years on bunyavirales, incl. Arenaviridae (27 articles), and Phleboviruses (70 articles). He is the WP leader in a EU funded project (VHFMoDRAD, 2019-2022) dedicated to the rapid detection of six RNA-genome biodefense agents including CCHF, yellow fever virus, and Rift valley fever virus (the 2 latter being addressed in Marseille) using CEPHEID technology together with Primers&Probe reagents. Recently, this research theme has been reinitiated with the support of several grants (VHFModRAD, PrepMedVet). The recent discovery of CCHFV in France has also prompted renewed interest that has been translated into research project submission.

- Cicculli V, Maitre A, Ayhan N, Mondoloni S, Paoli JC, Vial L, de Lamballerie XN, **Charrel R**, Falchi A. Lack of Evidence for Crimean-Congo Hemorrhagic Fever Virus in Ticks Collected from Animals, Corsica, France. Emerg Infect Dis. 2022 May;28(5):1035-1038. doi: 10.3201/eid2805.211996
- Thirion L, Pezzi L, Corcostegui I, Dubot-Pérès A, Falchi A, de Lamballerie X, **Charrel RN**. Development and Evaluation of a Duo Chikungunya Virus Real-Time RT-PCR Assay Targeting Two Regions within the Genome. Viruses. 2019 Aug 15;11(8):755. doi: 10.3390/v11080755.
- Andayi F, **Charrel RN**, Kieffer A, Richet H, Pastorino B, Leparc-Goffart I, Ahmed AA, Carrat F, Flahault A, de Lamballerie X. A sero-epidemiological study of arboviral fevers in Djibouti, Horn of Africa. PLoS Negl Trop Dis. 2014 Dec 11;8(12):e3299.
- Ferron F, Li Z, Danek EI, Luo D, Wong Y, Coutard B, Lantez V, **Charrel R**, Canard B, Walz T, Lescar J. The hexamer structure of Rift Valley fever virus nucleoprotein suggests a mechanism for its assembly into ribonucleoprotein complexes. PLoS Pathog. 2011 May;7(5):e1002030.
- Lantez V, Dalle K, **Charrel R**, Baronti C, Canard B, Coutard B. Comparative production analysis of three phlebovirus nucleoproteins under denaturing or non-denaturing conditions for crystallographic studies. PLoS Negl Trop Dis. 2011 Jan 4;5(1):e936.
- **Charrel RN**, Attoui H, Butenko AM, Clegg JC, Deubel V, Frolova TV, Gould EA, Gritsun TS, Heinz FX, Labuda M, Lashkevich VA, Loktev V, Lundkvist A, Lvov DV, Mandl CW, Niedrig M, Papa A, Petrov VS, Plyusnin A, Randolph S, Süss J, Zlobin VI, de Lamballerie X. Tick-borne virus diseases of human interest in Europe. Clin Microbiol Infect. 2004 Dec;10(12):1040-55.

5. Research records in the field SARS-CoV-2 and COVID

As all of us, Dr Charrel has faced the SARS-CoV-2 pandemic and has switched some of his research activities in the COVID direction

- Couderc AL, Ninove L, Nouguerède E, Rey D, Rebroin M, Daumas A, Tomasini P, Greillier L, Salas S, Duffaud F, Dahan L, Duluc M, Garcia ME, Pluvy J, Chaléat S, Farnault L, Venton G, Fourié T, Nurtop E, de Lamballerie X, Villani P, **Charrel R**, Correard F. Acceptance, efficacy, and safety of COVID-19 vaccination in older patients with cancer. J Geriatr Oncol. 2022 Jul;13(6):850-855. doi: 10.1016/j.jgo.2022.05.002.
- Sett S, Dos Santos Ribeiro C, Prat C, Haringhuizen G; European Virus Archive principal investigators; Scholz AH. Access and benefit-sharing by the European Virus Archive in response to COVID-19. Lancet Microbe. 2022 Apr;3(4):e316-e323. doi: 10.1016/S2666-5247(21)00211-1.
- Noel L, Marion E, Boufercha R, Martin F, Zandotti C, **Charrel R**, Bouhadfane M, Lehucher-Michel MP, Villa A. Screening of health workers exposed to SARS-CoV-2 in a university hospital in the south of France. Int Arch Occup Environ Health. 2022 Mar;95(2):419-424. doi: 10.1007/s00420-021-01789-6.
- Decarreaux D, Sevila J, Masse S, Capai L, Fourié T, Saba Villarroel PM, Amroun A, Nurtop E, Vareille M, Pouquet M, Blanchon T, de Lamballerie X, **Charrel R,** Falchi A. A Cross-Sectional Study of Exposure Factors Associated with Seropositivity for SARS-CoV-2 Antibodies during the Second Epidemic Wave among a Sample of the University of Corsica (France). Int J Environ Res Public Health. 2022 Feb 10;19(4):1953. doi: 10.3390/ijerph19041953.
- Calvo-Lozano O, Sierra M, Soler M, Estévez MC, Chiscano-Camón L, Ruiz-Sanmartin A, Ruiz-Rodriguez JC, Ferrer R, González-López JJ, Esperalba J, Fernández-Naval C, Bueno L, López-Aladid

R, Torres A, Fernández-Barat L, Attoumani S, **Charrel R**, Coutard B, Lechuga LM. Label-Free Plasmonic Biosensor for Rapid, Quantitative, and Highly Sensitive COVID-19 Serology: Implementation and Clinical Validation. Anal Chem. 2022 Jan 18;94(2):975-984. doi: 10.1021/acs.analchem.1c03850.

- Lopez E, Barthélémy M, Baronti C, Masse S, Falchi A, Durbesson F, Vincentelli R, de Lamballerie X, **Charrel R**, Coutard B. Endonuclease-based genotyping of the RBM as a method to track the emergence or evolution of SARS-CoV-2 variants. iScience. 2021 Nov 19;24(11):103329. doi: 10.1016/j.isci.2021.103329.
- Baronti C, Coutard B, de Lamballerie X, **Charrel R**, Touret F. Evaluation of formulations to improve SARS-CoV-2 viability and thermostability after lyophilisation. J Virol Methods. 2021 Nov;297:114252. doi: 10.1016/j.jviromet.2021.114252.
- Capai L, Masse S, Fourié T, Decarreaux D, Canarelli J, Simeoni MH, Amroun A, Mohammed-Ali S, Saba Villarroel PM, de Lamballerie X, **Charrel R**, Falchi A. Impact of the Second Epidemic Wave of SARS-CoV-2: Increased Exposure of Young People. Front Public Health. 2021 Jul 26;9:715192. doi: 10.3389/fpubh.2021.715192.
- Capai L, Ayhan N, Masse S, Canarelli J, Priet S, Simeoni MH, Charrel R, Lamballerie X, Falchi A. Seroprevalence of SARS-CoV-2 IgG Antibodies in Corsica (France), April and June 2020. J Clin Med. 2020 Nov 5;9(11):3569. doi: 10.3390/jcm9113569.
- Pastorino B, Touret F, Gilles M, de Lamballerie X, **Charrel RN.** Prolonged Infectivity of SARS-CoV-2 in Fomites. Emerg Infect Dis. 2020 Sep;26(9):2256–7. doi: 10.3201/eid2609.201788.
- Mögling R, Meijer A, Berginc N, Bruisten S, **Charrel R,** Coutard B, Eckerle I, Enouf V, Hungnes O, Korukluoglu G, Kossyvakis T, Mentis A, Molenkamp R, Muradrasoli S, Papa A, Pigny F, Thirion L, van der Werf S, Reusken C. Delayed Laboratory Response to COVID-19 Caused by Molecular Diagnostic Contamination. Emerg Infect Dis. 2020 Aug;26(8):1944-1946. doi: 10.3201/eid2608.201843.
- Pezzi L, **Charrel RN**, Ninove L, Nougairede A, Molle G, Coutard B, Durand G, Leparc-Goffart I, de Lamballerie X, Thirion L. Development and Evaluation of a duo SARS-CoV-2 RT-qPCR Assay Combining Two Assays Approved by the World Health Organization Targeting the Envelope and the RNA-Dependant RNA Polymerase (RdRp) Coding Regions. Viruses. 2020 Jun 25;12(6):686. doi: 10.3390/v12060686.
- Reusken CBEM, Broberg EK, Haagmans B, Meijer A, Corman VM, Papa A, **Charrel R**, Drosten C, Koopmans M, Leitmeyer K; EVD-LabNet and ERLI-Net. Laboratory readiness and response for novel coronavirus (2019-nCoV) in expert laboratories in 30 EU/EEA countries, January 2020. Euro Surveill. 2020 Feb;25(6):2000082. doi: 10.2807/1560-7917.ES.2020.25.6.2000082.

6. Research records in the field Nosocomial infections

   The recent appointment of Dr Charrel as head of the Nosocomial Infections Control Committee of the University Hospital System of Marseille has stimulated studies in this field.

   - Sartor C, Ligi I, Petit PR, Grandvuillemin I, Zandotti C, Nougairede A, Schipani S, Fenollar F, **Charrel RN.** Outbreak of adenovirus D8 in a neonatal intensive care unit involving multiple simultaneous transmission pathways. J Hosp Infect. 2023 Oct;140:54-61. doi: 10.1016/j.jhin.2023.06.031. Epub 2023 Jul 26. PMID: 37499763.
   - Noel L, Marion E, Boufercha R, Martin F, Zandotti C, **Charrel R,** Bouhadfane M, Lehucher-Michel MP, Villa A. Screening of health workers exposed to SARS-CoV-2 in a university hospital in the south of France. Int Arch Occup Environ Health. 2022 Mar;95(2):419-424. doi: 10.1007/s00420-021-01789-6. Epub 2021 Oct 15. PMID: 34654945; PMCID: PMC8519329.
   - Lopez E, Barthélémy M, Baronti C, Masse S, Falchi A, Durbesson F, Vincentelli R, de Lamballerie X, **Charrel R**, Coutard B. Endonuclease-based genotyping of the RBM as a method to track the emergence or evolution of SARS-CoV-2 variants. iScience. 2021 Nov 19;24(11):103329. doi:10.1016/j.isci.2021.103329. Epub 2021 Oct 21. PMID: 34697603; PMCID: PMC8529542.

7. Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/1f3vhqbScBh5g/bibliography/public/

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

Charrel, R.N. (MPI), Coutard B (PD) **2024-2025**
ISIDORe JRA programme, ISID_JRA_VECT04
#ISIDORe JRA_zj0y
WNED-X: “Development of facility access sites and methods for sensitive, easy-to-use, rapid and affordable West Nile virus early detection tools”

Charrel, R.N. (MPI), Coutard B (PD) **2023-2025**
HORIZON-INFRA-2023-DEV-01-04
Consolidation of the RI landscape – development of complementarities, synergies and/or integration between a set of pan- European research infrastructures
EVORA: "EUROPEAN VIRAL OUTBREAK RESPONSE ALLIANCE

Charrel, R.N. (MPI), Koopmans M (PD) **2023-2027**
EU4Health Programme (EU4H)
EU4H-PJG #101102733
DURABLE: "Delivering a Unified Research Alliance of Biomedical and public health Laboratories against Epidemics""

Charrel, R.N. (MPI), Maia C (PD) **2023-2026**
HORIZON-HLTH-2021-ENVHLTH-02-03
CLIMOS "Climate monitoring and decision support framework for sand fly-borne diseases detection and mitigation with cost-benefit and climate-policy measures"

Charrel, R.N. (MPI), Failloux AB (PD) **2020-2024**
ANSES research program
MOSQUITWO "Transmission de deux arbovirus (West Nile et Usutu) par les moustiques du nord de la France".

Charrel, R.N. (MPI), Coutard B (PD) **2020-2024**
EU H2020-871029
EVA-GLOBAL European Virus Archive - GLOBAL

Charrel, R.N. (MPI), Pohlmann, A. (PD) **09/01/20-08/31/24**
ANR Franco-German call on Civil Security/Global Security 2019 edition
PREPMedVet "Preparedness and Response in an Emergency context to Pathogens of MEDical and VETerinary importance.

Completed Research Support

Charrel, R.N. (MPI), Lechuga L (PD) **04/01/20-10/31/22**
EU H2020-101003544
CONVAT "Combating 2019-nCoV: Advanced Nanobiosensing platforms for POC global diagnostics and surveillance".

Charrel, R.N. (PD) **09/01/20-01/31/22**
EU H2020-JTI-IMI2-101005075
KRONO "Evaluation and EUA validation of a production ready portable, Point-of-Need Platform (instrument and reagents), direct from nasal swab test for the molecular diagnostic detection of COVID-19 infection"

Charrel, R.N. (MPI), Mirazimi, A. (PD) 01/01/19-12/31/22
EU H2020-IMI2-823666, VHFMoDRAD
Viral haemorrhagic fever: modern approaches for developing bedside rapid diagnostics. The aim is to develop rapid point-of-care (POC) diagnostic tools capable of identifying a number of viral haemorrhagic fevers. The new tools and methods developed by VHFMoDRAD will be validated in the field. VHFMoDRAD will contribute to better preparedness for outbreaks of viral haemorrhagic fevers, and to capacity building in Africa.

Charrel, R.N. (MPI), Falchi, A. (PD) 01/01/18-12/31/19
FEDER EU 17-DESR-SR-88
Reduce propagation of hepatitis E virus in Corsica, and developing a vaccine candidate. It aims at preliminary studies in order to develop a vaccine for protecting pigs from infection with Hepatitis E virus.

Charrel, R.N. (MPI), Romette JL (PD) 01/01/15-10/31/19
EU H2020-653316
An international group of 25 laboratories, including 16 EU member state institutions and 9 non-EU institutions, that represent an extensive range of virological disciplines We are the first and currently, the only 21st century global virus collection conceived as a modern and innovative support organization for scientific research, education and disease control through human and veterinary health programs. The project objectives meet the needs of scientists, worldwide, by generating a carefully authenticated animal virus collection that is larger than any existing repository, and readily available to all laboratories that meet approved ethical, safety and security standards.

Charrel, R.N. (MPI), Reusken, C.B.M.E. (PD) 01/01/16-12/31/19
ECDC EVDLabNet
Emerging Viral Diseases expert Laboratory Network for early detection and surveillance of re(emerging) vector-borne viral diseases"

Charrel, R.N. (Co-PI), de Lamballerie, X. (PI),Romette, J.L. (PD) 01/01/2009-12/31/2014
EU FP7-INFRASTRUCTURES 228292
The aim of the European Virus Archive project (EVA) is to create and mobilize a European network of high caliber centers with the appropriate expertise, to collect, amplify, characterize, standardize, authenticate, distribute and track, mammalian and other exotic viruses. EVA project reached its objective to develop a readily accessible virus reference library at the European level through the creation of its Virus Archive. Since it would create insurmountable problems to develop such a collection in a single laboratory, EVA uses the expertise and facilities of recognised centres of excellence in virology within Europe. EVA also exploits the high international reputations of these centres to obtain viruses currently held outside Europe.

Charrel, R.N. (PI), Van der Werf, S. (PD) 11/01/2011-04/30/2017
EU FP7-HEALTH 278433
PREDEMICS (Preparedness, Prediction and Prevention of Emerging Zoonotic Viruses with Pandemic Potential using Multidisciplinary Approaches)
The overall objectives of PREDEMICS were to:
• Identify key factors (considering environment, ecology, anthropology, virus evolution and virus-host interplay) associated with the highest risk of virus emergence at the 4 stages of emergence, i.e. exposure and introduction into a new host species, infection causing local chains of transmission, spread in human populations and post-transfer adaptation leading to widespread transmission and pandemics
• Determine the impact of the transmission route on viral evolutionary trajectories and cross-species transmission
• Unravel the mechanisms that govern interactions between a virus, its hosts and the environment to favour/limit cross-species transmission and adaptation to a new host
• Evaluate most effective intervention strategies to limit cross-species transmission and spread in the new host
• Identify risk patterns of emergence of practical relevance for disease surveillance control and intervention, and pandemic preparedness

Charrel, R.N. (PI), Lancelot, R. (PD) 01/01/2011-06/30/2015

EU FP7-HEALTH 261504
Towards this goal, the EU-funded EDENEXT (Biology and control of vector-borne infections in Europe) project investigated the biological, ecological and epidemiological components of VBI emergence and transmission. Following the footsteps of its predecessor, the FP6 EDEN project, EDENEXT set out to develop state-of-the-art methods and tools to improve prevention, surveillance and control of vector populations. The consortium benefited from the datasets, experience, and capacity gained after the EDEN project to develop predictive models of vector-population dynamics, and disease transmission and spread.

Ongoing Research Support (Suppl. Table)

2020-2023 **WP leader**	EVA-GLOBAL European Virus Archive - GLOBAL, Project no 871029, ***FUNDED***
2020-2023 **WP leader**	ANR France - Allemagne, PREPMedVet "**P**reparedness and **R**esponse in an **E**mergency context to **P**athogens of **MED**ical and **VET**erinary importance., ***FUNDED***
2021-2024 **WP leader**	MOSQUITWO "*Transmission de deux arbovirus (West Nile et Usutu) par les moustiques du nord de la France*". Appel à projets ANSES ***FUNDED***
2020-2021 **WP leader**	COVID-SeroPRIM: Seroprevalence of IgG antibodies to SARS-CoV-2 in primary health care workers and their household contacts, ***FUNDED***
2021-2025 **Program Deputy Leader** **WP leader**	Continuation of Emerging Viral Diseases- expert Laboratory Network (EVDLabNet) "Establishment of a European Network of Laboratories for early detection and surveillance of re(emerging) vector-borne viral diseases" ECDC, ***FUNDED***

2022-2026 **WP leader + Nazli Ayhan**	CLIMOS HORIZON-HLTH-2021-ENVHLTH-02-03 Health impacts of climate change, costs and benefits of action and inaction. CLIMOS "*Climate monitoring and decision support framework for sand fly-borne diseases detection and mitigation with cost-benefit and climate-policy measures*", ***FUNDED***
2023-2027 **Partner** **EU4Health Programme (EU4H)**	DURABLE Research Network against Epidemics **Call: EU4H-2021-PJ4 (**(Project grant wave 4) **Topic:** EU4H-2021-PJ-20 **Type of Action:** EU4H-PJG **Proposal number: 101102733** **DURABLE: "D**elivering a **U**nified **R**esearch **A**lliance of **B**iomedical and public health **L**aboratories against **E**pidemics", ***FUNDED***
2024-2026 **Coordinator** **HORIZON-INFRA**	EVORA **Call:** HORIZON-INFRA-2023-DEV-01-04 **Type of Action:** HORIZON-RIA Consolidation of the RI landscape – development of complementarities, synergies and/or integration between a set of pan- European research infrastructures **EVORA: "E**UROPEAN **V**IRAL **O**UTBREAK **R**ESPONSE **A**LLIANCE ", ***FUNDED***
2024-2025 **Partner**	ISIDORe Call ISID_JRA_VECT04 within the ISIDORe JRA programme WNED-X: "*Development of facility access sites and methods for sensitive, easy-to-use, rapid and affordable West Nile virus early detection tools*" ISIDORe JRA_zj0y
2024-2029 PEPR PREZODE	ARCHE: Assessing the Risk of Crimean-Congo Haemorrhagic fever Emergence in Southern France. PEPR PREZODE, ***Submitted***
2024-2027 ANR	COCTAIL, ***Submitted***
2024-2027	TABONO: Tracking African vector Borne diseases through pOint of care diagNostics and a One Health Approach, ***Submitted*** Call: HORIZON-JU-GH-EDCTP3-2023-02-two-stage (Research and Innovation actions supporting the global health EDCTP3

	Joint Undertaking) Topic: HORIZON-JU-GH-EDCTP3-2023-02-02-two-stage Type of action: HORIZON-JU-RIA (HORIZON JU Research and Innovation Actions) Proposal number: 101159144-1 ***Submitted***
2024-2031 	EURL-VB viral, ***Submitted***
2024-2026 	**Open Call Collection OC-2023-1** **Proposal Reference OC-2023-1-26637** **Title: European Network on Arbovirus Genomics** **Acronym: ArboGenNet-EU** ***Submitted***
2024-2026 	**ICODAV-3CAOH (Influence of climate change on the distribution of arbovirus vectors and determination of the emergence/re-emergence of arboviroses in 3 Central African countries in a "One-Health" context)** ***Submitted***