BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: RUBIO Marie Therese

eRA COMMONS USER NAME (credential, e.g., agency login): marie-therese.rubio@orcid

POSITION TITLE: MD,PhD. Attending physician Department of Hematology, Nancy University Hospital; Professor of Immunology, University of Lorraine

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 *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Medical doctor degree, Claude-Bernard University-Lyon, France	MD	1999	Medical Hemato-oncologist
Residency, Claude-Bernard University-Lyon, France	Residency	1997-2001	Medical Hemato-oncology
Fellowship, Transplantation Biology Research Center, BMT section, Pr Megan Sykes' laboratory, Massachusetts General Hospital / Harvard Medical School, Boston, USA	Research fellow	2001-2003	Hematopoietic stem cell transplantation, immunology
Doctoral program and PhD degree in immunology Claude- Bernard University-Lyon, France	PhD	2001-2004	Immunology
Chef de Clinique Assistant, Adult Hematology department. Pr Bruno Varet and Olivier Hermine, Necker University Hospital, Paris, France	Assistant professor	2004-2008	Hematology
Assistant Professor, Adult Hematology department. Pr Bruno Varet and Olivier Hermine, Necker University Hospital, Paris, France	Assistant professor	2008-2009	Hematology
Praticien hospitalier, Cell therapy and hematology department, Saint Antoine university Hospital, Paris, France. **Responsible for the allogeneic SCT program**	Attending physician	2009-2016	Hematology
Habilitation to conduct research (HDR)	HDR	Nov 2015	Immunology
Professor in clinical immunology, Hematology department, Hôpital Brabois, University hospital, Nancy. France. **Head of the cell therapy unit.**	Professor	Sept 2016-	Hematology and immunology
Professor on Immunology, **co-leader of IMoPA Team 6** IMOPA, CNRS UMR 7365, Lorraine University, France	Professor	Jan 2018-	Immunology, translational research in cell therapies
Professor of Immunology, **associate director CNRS** UMR 7365 IMoPA, Lorraine University, France	Professor	Jan 2024-	Immunology, translational research in cell therapies

A. Personal Statement

I am a cell therapy hematologist at Nancy University Hospital and a Professor in Immunology at the University of Lorraine. I lead a clinical team of 5 physicians dedicated to cell immunotherapies (allogeneic stem cell transplantation and CAR-T cells) for hematological malignancies. I am co-leader of the research team 6, CImIND (Cell-engineering & Immunomodulation of Inflammatory & Neoplastic Disorders) of the CNRS UMR

7365 IMoPA (Molecular and cellular engineering and physiopathology) unit at the Lorraine University in Nancy. Since January 2024, I became associate director of the CNRS UMR 7365 IMoPA unit including 8 research teams from fundamental molecular research to translational disease pathophysiology and development of new therapeutic approaches.

I followed a double cursus of qualification: first as a doctor with a MD in clinical onco-hematology and in parallel as scientist with a PhD in immunology. I graduated as a MD in Lyon France in 1999 and then went to Necker hospital in Paris where I specialized in allogeneic stem cell transplantation as the main cancer immunotherapy for hematological malignancies. In parallel, I followed a scientific formation in the field of immunology of cancer and performed a post-doctoral fellowship in Megan Sykes' laboratory in Boston between 2001 and 2003 during which I deepened my knowledge of immunology of allogeneic stem cell transplantation and in particular the potential of modulating dendritic cell and anti-leukemic T cell responses in mouse models (Rubio et al. Blood 2003; Rubio et al. Int J Oncol. 2004; Rubio et al. J Immunol 2005; Rubio et al. Int Immunol. 2005; Eoms, Rubio et al. Exp Hematol. 2005 ; Rubio et al. Clin Immunol 2006 and Saito, Rubio et al. Exp Hematol. 2006).

I went back to France as a physician in Necker university hospital in 2004 and became assistant professor in 2008. While developing a strong experience in clinical management of hematological malignancies and in clinical studies of allografted patients (Coman and Rubio et al. Haematologica 2013, Rubio et al. Haematologica 2015, Rubio et al. JOHN 2016…), I developed several translational research programs in order to better understand the immunological regulation of graft versus host disease. In particular by dissecting the role of human invariant NKT cells in allogeneic stem cell transplantation (Milpied and Rubio, Blood 2011; Rubio et al. Blood 2012, Rubio et al. Leukemia 2017, or of myeloid-derived suppressive cells (D'Aveni and Rubio, Science Translational Medicine 2015), or that of complement activation (Seignez et al, JCI insight 2017 and Notarantonio and Rubio, Am J Hematol 2023).

Based on this clinical and biological background in immunology of stem cell transplantation, I was recruited as full time Professor position in Nancy university hospital in september 2016 to lead a clinical team and developed my own research team in IMoPa since January 2018. In parallel to set up the haploidentical transplant plateform and the implementation of CAR-T cell programs in the clinics, I was able to develop immune monitoring studies in patients receiving allogeneic stem cell transplantation and CAR-T cells (Rubio at al. Bull Cancer 2021; Jandin et al. Br J Haematol 2023). I built an immunology research team with the contribution of both scientists and medical researchers with the objective of further explore the role and mechanisms of action of immunomodulatory cells such as stromal mesenchymal stem cells (MSCs) (Pochon et al. J Cancer Res Clin Oncol. 2022 and manuscript in revision), myeloid derived-suppressive cells (MDSCs) (D'Aveni and Rubio, Frontiers in Immunology, 2020: Notarantonio et al. manuscript in revision), invariant NKT (iNKT) cells (Coman and Rubio, Oncoimmunology 2018) and NK cells (Dhuyser et al. Front Immunol 2023) in the regulation of the immunological effects of allogeneic stem cell transplantation (GVHD but also disease relapse risk). Our team has also an expertise in producing therapeutical cell subtypes at GMP grade thanks to the close relation with the cell therapy unit directed by Pr Daniel Bensoussan in Nancy Hospital also member of our research team leading to several patents protecting our cell production protocols for MSCs (EP1871945.7), MDSCs (EP23307324.6) and iNKT cells (WO 2023/232750 A1). More recently, I recruited Dr Simona Pagliuca to complete the team who brought a strong experience in the exploration of immune regulation at the molecular level (Pagliuca et al. Nat Com 2023; Pagliuca et al. Req Sq 2023, Pagliuca et al. Int J Mol Sci. 2022 …).

Our clinical and basic research group is therefore dedicated to the understanding of tumor microenvironment by dissecting the interactions between stromal cells, leukemic cells, immunosuppressive and effector T cells in myeloid malignancies in the context of cell therapies and ways of modulating them at the cellular and molecular levels.

B. Positions, Scientific Appointments, and Honors

Year	Description
Positions and Employment	
2001-2003	Research fellow Transplantation Biology Research Center, BMT section, Pr Megan Sykes' laboratory, Massachusetts General Hospital / Harvard Medical School, Boston, USA
2004-2008	Chef de Clinique Assistant, Adult Hematology department. Pr Bruno Varet, Necker University Hospital, Paris, France
2008-2009	Assistant Professor, Adult Hematology department. Pr Bruno Varet, Necker University Hospital, Paris, France
2009-2016	Attending physician, Cell therapy and hematology department, Saint Antoine university Hospital, Paris, France. Responsible for the allogeneic SCT program
2016-	Professor in clinical immunology, Hematology department, Hôpital, Brabois, University hospital, Nancy. France. Head of the cell therapy unit.
2018-	Professor on Immunology, co-leader of IMoPA Team 6 IMOPA, CNRS UMR 7365, Lorraine University, France
2024-	Associate director of CNRS UMR 7365 research unit IMoPA (Ingénierie Moléculaire, Cellulaire et Physiopathologie) Lorraine University, France
Professional Memberships	
2012-	Member of the French Society of Bone Marrow Transplantation and Cell Therapy (SFGM-TC) President of the scientific committee from January 2017 to December 2020
2015-	Member of the European group for Blood and Marrow transplantation (EBMT)
2019-	Member of the French Society of Immunology (SFI) and of the CITC (Cell immunotherapy Club)
2023-	Member of the French Society of Cancer Immunotherapy (FITC)
Patents	
Dec 2012	EP 12 306 445.3 : Methods for determining the risk of acute graft versus host disease
May 2022	EP 22 305 788.6 : PROCESS FOR THE OBTENTION OF INVARIANT NATURAL KILLER T CELLS. International pattern WO 2023/232750 A1
Dec 2023	EP23307324.6: POPULATION OF MYELOID-DERIVED SUPPRESSOR CELLS AND USES THEREOF
Honors	
2011	PRTK National Cancer Institute (INCa) research grant
2012	Prize of the French Academy of Sciences-General Health Foundation
2013	Association Capucine research grant
2014	PHRC-K National Cancer Institute (INCa) grant
2017	PRTK National Cancer Institute (INCa) research grant
2017	Ligue contre le Cancer research grant
2018	Ligue contre le Cancer research grant and one PhD thesis funding for 3 years
2019	Association Capucine research grant
2021	Ligue contre le Cancer research grant and one PhD thesis funding for 3 years
2021	Association Leucémie espoir research grant
2021	Association Laurette Fugain research grant
2023	Ligue contre le Cancer research grant

C. Contributions to Science

Main publications on allogeneic stem cell transplantation biology (translational and mouse models):

-Notarantonio AB, D'aveni-Piney M, Pagliuca S, Ashraf Y, Galimard JE, Xhaard A, Marçais A, Suarez F, Brissot E, Feugier P, Urien S, Bouazza N, Jacquelin S, Meatchi T, Bruneval P, Frémeaux-Bacchi V, Peffault De Latour R, Hermine O, Durey-Dragon MA, **Rubio MT**. Systemic complement activation influences outcomes after allogeneic hematopoietic cell transplantation: A prospective French multicenter trial. **Am J Hematol. 2023** Oct;98(10):1559-1570

- Pagliuca S, Gurnari C, Hercus C, Hergalant S, Hong S, Dhuyser A, D'Aveni M, Aarnink A, **Rubio MT**, Feugier P, Ferraro F, Carraway HE, Sobecks R, Hamilton BK, Majhail NS, Visconte V, Maciejewski JP. Leukemia relapse via genetic immune escape after allogeneic hematopoietic cell transplantation. **Nat Commun. 2023** May 31;14(1):3153.

- Jandin A, Pochon C, Campidelli A, D'Aveni M, Kicki C, Notarantonio AB, Roth Guepin G, Mbuyi TA, Feugier P, Chastagner P, Schweitzer C, de Carvalho Bittencourt M, **Rubio MT,** Pagliuca S. Age-related immune cell dynamics influence outcomes after allogeneic haematopoietic cell transplantation. **Br J Haematol. 2023** Jul;202(1):122-134.

- Pagliuca S, Gurnari C, Hercus C, Hergalant S, Hong S, Dhuyser A, D'Aveni M, Aarnink A, **Rubio MT**, Feugier P, Ferraro F, Carraway HE, Sobecks R, Hamilton BK, Majhail NS, Visconte V, Maciejewski JP. Leukemia relapse via genetic immune escape after allogeneic hematopoietic cell transplantation. **Res Sq. 2023** Apr 5:rs.3.rs-2773498.

-Dhuyser A, Remen T, Pérès M, Chamberlain-Evans V, Nemat-Gorgani N, Campidelli A, Clément S, **Rubio MT**, Trowsdale J, Aarnink A, Traherne J. Comparison of NK alloreactivity prediction models based on KIR-MHC interactions in haematopoietic stem cell transplantation. **Front Immunol. 2023** Mar 2;14:1028162.

-Zeng Y, Liu B, **Rubio MT**, Wang X, Ojcius DM, Tang R, Durrbach A, Ru Z, Zhou Y, Lone YC. Creation of an immunodeficient HLA-transgenic mouse (HUMAMICE) and functional validation of human immunity after transfer of HLA-matched human cells. **PLoS One. 2017** Apr 11;12(4):e0173754.

-Seignez A, Joly AL, Chaumonnot K, Hazoumé A, Sanka M, Marcion G, Boudesco C, Hammann A, Seigneuric R, Jégo G, Ducoroy P, Delarue P, Senet P, Castilla-Llorente C, Solary E, Durey MA, **Rubio MT**, Hermine O, Kohli E, Garrido C. Serum Gp96 is a chaperone of complement-C3 during graft-versus-host disease**. JCI Insight. 2017** Mar 23;2(6):e90531.

Publications on iNKT cells :

-Coman T, Rossignol J, D'Aveni M, Fabiani B, Dussiot M, Rignault R, Babdor J, Bouillé M, Herbelin A, Coté F, Moura IC, Hermine O, **Rubio MT.** Human CD4- invariant NKT lymphocytes regulate graft versus host disease. **Oncoimmunology. 2018** Aug 23;7(11):e1470735.

-**Rubio MT**, Bouillié M, Bouazza N, Coman T, Trebeden-Nègre H, Gomez A, Suarez F, Sibon D, Brignier A, Paubelle E, Nguyen-Khoc S, Cavazzana M, Lantz O, Mohty M, Urien S, Hermine O. Pre-transplant donor CD4(-) invariant NKT cell expansion capacity predicts the occurrence of acute graft-versus-host disease. **Leukemia. 2017** Apr;31(4):903-912.

-**Rubio MT**, Moreira-Teixeira L, Bachy E, Bouillié M, Milpied P, Coman T, Suarez F, Marcais A, Sibon D, Buzyn A, Caillat-Zucman S, Cavazzana-Calvo M, Varet B, Dy M, Hermine O, Leite-de-Moraes M. Early post-transplantation donor-derived invariant natural killer T-cell recovery predicts the occurrence of acute graft-versus-host disease and overall survival. **Blood. 2012** Sep 6;120(10):2144-54.

-Milpied P, Massot B, Renand A, Diem S, Herbelin A, Leite-de-Moraes M, **Rubio MT**, Hermine O. IL-17-producing invariant NKT cells in lymphoid organs are recent thymic emigrants identified by neuropilin-1 expression. **Blood. 2011** Sep 15;118(11):2993-3002.

Publications on MSCs and MDSCs in allogeneic stem cell transplantation:

-Pochon C, Notarantonio AB, Laroye C, Reppel L, Bensoussan D, Bertrand A, **Rubio MT**, D'Aveni M. Wharton's jelly-derived stromal cells and their cell therapy applications in allogeneic haematopoietic stem cell transplantation. **J Cell Mol Med. 2022** Mar;26(5):1339-1350

-D'Aveni M, Notarantonio AB, Agbogan VA, Bertrand A, Fouquet G, Gastineau P, Garfa-Traoré M, De Carvalho M, Hermine O, **Rubio MT,** Zavala F. Mobilized Multipotent Hematopoietic Progenitors Promote Expansion and Survival of Allogeneic Tregs and Protect Against Graft Versus Host Disease. **Front Immunol. 2021** Feb 12;11:607180.

-D'Aveni M, Notarantonio AB, Bertrand A, Boulangé L, Pochon C, **Rubio MT**. Myeloid-Derived Suppressor Cells in the Context of Allogeneic Hematopoietic Stem Cell Transplantation. **Front Immunol. 2020** May 22;11:989.

-M. D'Aveni, J. Rossignol,T. Coman, S. Sivakumaran, S. Henderson, T. Manzo, J. Bruneau, G.Fouquet, F. Zavala, O. Alegria-Prévot, M. Garfa-Traoré, F. Suarez, H. Trebeden-Nègre, M. Mohty, C. L. Bennett, R. Chakraverty, O. Hermine, **M.T. Rubio**. G-CSF mobilizes CD34+ regulatory monocytes that inhibit Graft-versus-Host Disease. **Sci Transl Med. 2015** Apr 1;7(281):281ra42.

Main clinical publications in allogenic stem cell transplantation:

- Notarantonio AB, Roth-Guépin G, Bonmati C, Divoux M, Kicki C, Pagliuca S, Campidelli A, **Rubio MT**, D'Aveni-Piney M. A new sequential conditioning regimen based on CPX- 351/Vyxeos ("Vyx-Seq") in patients with higher risk myelodysplastic syndromes. ***Leuk Res. 2023*** Dec;135:107405.

-Bonifazi F, **Rubio MT**, Bacigalupo A, Boelens JJ, Finke J, Greinix H, Mohty M, Nagler A, Passweg J, Rambaldi A, Socie G, Solano C, Walker I, Barosi G, Kröger N. Rabbit ATG/ATLG in preventing graft-versus-host disease after allogeneic stem cell transplantation: consensus-based recommendations by an international expert panel. **Bone Marrow Transplant. 2020** Jun;55(6):1093-1102.

-**Rubio MT**, D'Aveni-Piney M, Labopin M, Hamladji RM, Sanz MA, Blaise D, Ozdogu,H, Daguindeau E, Richard C, Santarone S, Irrera G, Yakoub-Agha I, Yeshurun M, Diez-Martin JL, Mohty M, Savani BN, Nagler A. Impact of in vivo T cell depletion in HLA-identical allogeneic stem cell transplantation for acute myeloid leukemia in first complete remission conditioned with a fludarabine iv-busulfan myeloablative regimen: a report from the EBMT Acute Leukemia Working Party. **J Hematol Oncol. 2017** Jan 24;10(1):31.

-**Rubio MT**, Savani BN, Labopin M, Polge E, Niederwieser D, Ganser A, Schwerdtfeger R, Ehninger G, Finke J, Renate A, Craddock C, Kröger N, Hallek M, Jindra P, Mohty M, Nagler A. The impact of HLA-matching on reduced intensity conditioning regimen unrelated donor allogeneic stem cell transplantation for acute myeloid leukemia in patients above 50 years-a report from the EBMT acute leukemia working party. **J Hematol Oncol. 2016** Aug 3;9(1):65.

-**Rubio MT**, Savani BN, Labopin M, Piemontese S, Polge E, Ciceri F, Bacigalupo A, Arcese W, Koc Y, Beelen D, Gülbas Z, Wu D, Santarone S, Tischer J, Afanasyev B, Schmid C, Giebel S, Mohty M, Nagler A. Impact of conditioning intensity in T-replete haplo-identical stem cell transplantation for acute leukemia: a report from the acute leukemia working party of the EBMT. **J Hematol Oncol. 2016** Mar15;9:25

-**M.T. Rubio,** M. Labopin , D. Blaise, G. Socié, R. Rojas Contreras, P. Chevallier, M. A. Sanz, S. Vigouroux, A. Huynh, A. Shimoni, C.E. Bulabois, N. Caminos, L. López-Corral, A. Nagler, M. Mohty. The impact of graft-versus host disease prophylaxis in reduced-intensity conditioning allogeneic stem cell transplant in acute myeloid leukaemia: a study from the Acute Leukemia Working Party of EBMT. **Haematologica. 2015** Mar 13.

Main clinical publication in CAR-T cells for hematological malignancies:

-Lemoine J, Bachy E, Cartron G, Beauvais D, Gastinne T, Di Blasi R, **Rubio MT**, Guidez S, Mohty M, Casasnovas RO, Joris M, Castilla-Llorente C, Haioun C, Hermine O, Loschi M, Carras S, Bories P, Fradon T, Herbaux C, Sesques P, Le Gouill S, Morschhauser F, Thieblemont C, Houot R. Nonrelapse mortality after CAR T-cell therapy for large B-cell lymphoma: a LYSA study from the DESCAR-T registry. **Blood Adv. 2023** Nov 14;7(21):6589-6598.

-Bachy E, Le Gouill S, Di Blasi R, Sesques P, Manson G, Cartron G, Beauvais D, Roulin L, Gros FX, **Rubio MT**, Bories P, Bay JO, Llorente CC, Choquet S, Casasnovas RO, Mohty M, Guidez S, Joris M, Loschi M, Carras S, Abraham J, Chauchet A, Drieu La Rochelle L, Deau-Fischer B, Hermine O, Gastinne T, Tudesq JJ, Gat E, Broussais F, Thieblemont C, Houot R, Morschhauser F. A real-world comparison of tisagenlecleucel and axicabtagene ciloleucel CAR T cells in relapsed or refractory diffuse large B cell lymphoma. **Nat Med. 2022** Oct;28(10):2145-2154*

-Alcantara M, Houillier C, Blonski M, **Rubio MT**, Willems L, Rascalou AW, Le Garff-Tavernier M, Maloum K, Bravetti C, Souchet L, Roos-Weil D, Morel V, Uzunov M, Metz C, Dhib-Charfi M, Nguyen S, Shor N, Psimaras D, Weiss N, Jacque N, Solorzano S, Gauthier N, Le Cann M, Norol F, Soussain C, Choquet S. CAR T-cell therapy in primary central nervous system lymphoma: the clinical experience of the French LOC network. **Blood. 2022** Feb 3;139(5):792-796

-Vercellino L, Di Blasi R, Kanoun S, Tessoulin B, Rossi C, D'Aveni-Piney M, Obéric L, Bodet-Milin C, Bories P, Olivier P, Lafon I, Berriolo-Riedinger A, Galli E, Bernard S, **Rubio MT**, Bossard C, Meignin V, Merlet P, Feugier P, Le Gouill S, Ysebaert L, Casasnovas O, Meignan M, Chevret S, Thieblemont C.Predictive factors of early progression after CAR T-cell therapy in relapsed/refractory diffuse large B-cell lymphoma. **Blood Adv. 2020** Nov 24;4(22):5607-5615

Recommandations on CAR-T cell monitoring and reviews:

- Berger SC, Fehse B, **Rubio MT**.2022 Feb 7. In: Kröger N, Gribben J, Chabannon C, Yakoub-Agha I, Einsele H, editors. Immune Monitoring. **The EBMT/EHA CAR-T Cell Handbook**. Cham (CH): Springer; **2022**. Chapter 35.PMID: 36122053

-Grinda T, Brouard J, Tran D, **Rubio MT**. Mechanisms of resistance and escape to CAR-T cells. **Bull Cancer. 2021** Oct;108(10S):S128-S140.

-**Rubio MT**, Varlet P, Allain V, Ballot C, Cuffel A, Deschamps M, Ferrand C, Foguenne J, Forcade E, Huynh A, Guihot A, Latouche JB, Lemarie C, Martinroche G, Morin F, Nguyen S, Schmit K, Servais S, Simonetta F, Yakoub-Agha I, Caillat Zucman S. Immunomonitoring of patients treated with CAR-T cells for hematological malignancy: Guidelines from the CARTi group and the Francophone Society of Bone Marrow Transplantation and Cellular Therapy (SFGM-TC)]. **Bull Cancer. 2021** Dec;108(12S):S53-S64.

-**Rubio MT**, Galaine J, Borg C, Daguindau É. Biology, concepts et principles of CAR-T cells. **Bull Cancer. 2018** Dec;105 Suppl 2:S135-S146.

The full list of contributions is available through the following link:
https://www.ncbi.nlm.nih.gov/myncbi/marie%20therese.rubio.1/bibliography/public/