

BIOGRAPHICAL SKETCH

NAME: VERGNOLLE Nathalie

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Research Director, Director of the Digestive Health Research Institute

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Baccalaureat, Lycee B. Palissy, Agen, France	(Honors)	06/1987	Science
Master Degree, Toulouse University, France	MSc (Honors)	06/1993	Biochemistry, Cell Physiology
Inra Toulouse, France, Pharmacology Department (Supervisor: L. Bueno), Toulouse University	PhD (Honors)	02/1997	Pharmacology
University of Calgary, Canada (Supervisor: Pr. John L. Wallace)	Post-Doc	12/2000	Pharmacology, Physiology

A. Personal Statement

I'm a gastrointestinal pharmacologist focusing on inflammation and pain. Having trained in France, I spent half of my research career (10 years) in Canada, at the University of Calgary, before coming back to France taking a position at the National Institute of Health and Medical Research (INSERM). There, I have founded and I am the current director of the Digestive Health Research Institute in Toulouse (200 persons), France, where I also head a research team (Gut Proteases Signals) focused on the role of proteolytic balance and pathways in intestinal diseases such as Irritable Bowel Syndrome (IBS) and Inflammatory Bowel Diseases (IBD). My research work has contributed to identify the major role of protease signals in inflammation and pain mechanisms. We have identified molecular targets (proteases and protease-activated receptors: PARs) for the treatment of inflammation and pain, having been the first to identify the pro-inflammatory effects (Vergnolle et al. 1999) and the pro-nociceptive effects (Vergnolle et al. 2001) of PARs. Our work has led pharmaceutical industry to launch programs on PAR inhibitors and protease inhibitors for the treatment of inflammation and pain, which are currently still on-going and for some of them in clinical phases.

B. Positions and HonorsPositions

- 2000-2004: Assistant Professor, University of Calgary, Canada
- 2004-2010: Associate Professor, University of Calgary, Canada
- 2007-2011: Research Director Class-2, INSERM, Toulouse, France
- 2011-2019: Research Director Class-1, Toulouse, France
- 2019-today: Research Director Exceptional Class, Toulouse, France

From 2011 to 2016, I was Deputy Director of the Toulouse Center of Pathophysiology, France. Since 2016, I'm the director of the Digestive Health Research Institute, Toulouse, France.

Awards & Honors (bold are international awards)

- 1993-96: Studentship from the French Ministry of Research
- 1997, 1999: Medical Research Council of Canada Fellow
- 1999: Alberta Heritage Foundation for Medical Research Fellow
- 2000-2003: Canadian Institute of Health Research Scholar
- 2001: **FASEB New Investigator Award**
- 2004: Young Investigator Award from the Canadian Association of Gastroenterology
- 2004: Merck-Frosst Young Investigator Award-Canadian Association of Gastroenterology

- 2006: **Master Award in Gastroenterology**- American Association of Gastroenterology
- 2007: **Schlumberger Foundation Award**
- 2007: Bettencourt-Schueller Foundation Award- INSERM Atipe-Avenir
- 2012: **ERC Consolidator Award** (European Research Council)
- 2013: Chevalière dans l'Ordre de la Légion d'Honneur (French Republic)
- 2013: **Woman in Inflammation Science Award** (World Society of Inflammation)
- 2015: Bettencourt-Schueller Foundation "Coup d'Elan" Award
- 2015: **GSK Fast-Track Challenge Award**
- 2018: **INSERM Research Award**
- 2020: **Grand Prize Marthe Condat for Research Innovation**
- 2023: **IUPHAR GI-section A. Robert Award** for outstanding contribution to **Gastrointestinal Pharmacology**

C. Contributions to Science

- Wallace, J.L., McKnight, W., Reuter, B., Vergnolle, N. Gastroenterology 2000 , 119, 706-714.	First demonstration of the dual role of Cox1 and Cox2 in gastric damage.
- *Steinhoff, M., *Vergnolle, N., et al. Agonists of proteinase-activated receptor-2 induce inflammation by a neurogenic mechanism. Nat Med 2000 , 6, 151-158. *Joint First Authors - Vergnolle, et al. Proteinase-activated receptor-2 and hyperalgesia: a novel pain pathway. Nat Med 2001 , 7, 821-826.	First demonstration of protease signaling to neurons and role in neurogenic inflammation. First demonstration of a role for proteases in pain signals.
-N. Cenac, C. Andrews, M. Holzhausen, K. Chapman, G. Cottrell, P. Andrade-Gordon, M. Steinhoff, G. Barbara, P. Beck, N. W. Bunnett, K. A. Sharkey, J. Gerraldo P. Ferraz, E. Shaffer, N. Vergnolle. J. Clin. Invest. 2007 , 117:636-47	First demonstration of a role for proteases in irritable bowel syndrome.
Motta, J.P., Bermudez-Humaran, L Deraison, C Martin, L., Rolland, C., Rousset, P., Chapman, K., Vinel, J.P., Alric, L., Mas, E., Sallénave, J.M., Langella, P., Vergnolle, N. Science Trans Med 2012 , 4(158):158ra-144.	First use of protease inhibitor delivery through food-grade bacteria for treatment of intestinal inflammation.
Cenac, N., Bautzova, T., Le Faouder P, Veldhuis NA, Poole DP, Rolland C, Bertrand J, Liedtke W, Dubourdeau M, Bertrand-Michel J, Zecchi L, Stanghellini V, Bunnett NW., Barbara, G., Vergnolle, N. Gastroenterology 2015 , 149(2): 433-44.	Identification of endogenous agonists of TRP channels in IBS patients, contributing to pain symptoms.
Rolland-Fourcade C, Denadai-Souza A, Cirillo C, Lopez C, Jaramillo JO, Desormeaux C, Cenac N, Motta JP, Larauche M, Taché Y, Berghe PV, Neunlist M, Coron E, Kirzin S, Portier G, Bonnet D, Alric L, Vanner S, Deraison C, Vergnolle N. Gut 2017 , 66(10): 1767-1778.	Demonstration of the effects of epithelial proteases on mucosal neuron activation and further visceral hypersensitivity and visceral pain.
Motta, J.P., Denadai-Souza, A., Sagnat, D., Guiraud, L., Edir, A., Bonnart, C., Sebbag, ., Rousset, P., Lapeyre, A., Seguy, C., Mathurine-Thomas, N., Galipeau, H.J., Bonnet, D., Alric, L., Buret, A., Wallace, J.L., Dufour, A., Verdu, E., Hollenberg, M.D., Oswald, E., Serino, M., Deraison, C., Vergnolle, N. Nat. Commun. 2019 , 10(1): 3224.	First demonstration of active thrombin production by the intestinal epithelium. First demonstration of gut mucosa microbial biofilm control by epithelial proteases.
12 Patents and 3 licences	-First method on the culture of human bladder organoids -Use of food grade recombinant bacteria for protease inhibitors as treatment of gut inflammatory disorders (IBS, IBD and Celiac) -Proteases as biomarkers of IBD and IBS - New targets for the treatment of IBD and IBS

D. Additional Information: Editorial Functions, Research Support and/or Scholastic Performance, Scientific Societies Membership

Editorial Functions:

- Editor: Drug and Development Research, Special Issue on Proteinase-Activated Receptors (2003)
- Editor: Current Opinion in Pharmacology, volume 5, Issue 6 Gastrointestinal: "Pharmacotherapy and gastrointestinal diseases: where have we been, where are we, and where are we going?" (2005)
- Editor of a Progress in Inflammation Research Book entitled "Proteases and their Receptors in Inflammation" 1st edition 2011, 300 pages, Springer Basel
- Section Editor of COPHAR journal (Current Opinion in Pharmacology), "Pharmacology of Intestinal Inflammation", Volume 24, 2015.
- Editorial Board Member of the "Neurogastroenterology and Motility" Journal (2006-2010)
- Editorial Board Member of "The International Journal of Biochemistry & Cell Biology" (2009-2011)
- Editorial board member of Frontiers in Pain Research (2020-2023)
- Associate Editor of the American Journal of Physiology (Gastrointestinal and Liver) (July 2015 - June 2018, renewed July 2018-June 2021 as Deputy Senior Editor)
- Review Editor of the British Journal of Pharmacology [BJP] (2016-2021)
- Member of the Editorial Board of the Journal "Medical Sciences" Proceedings of the Shevchenko Scientific Society since 2021
- Specialty Chief Editor for Frontiers in Pain Research, Abdominal and Pelvic Pain, since 2022
- Senior Editor of the British Journal of Pharmacology [BJP] since 2022

Research Support:

Past funding:

- In Canada: continuous and regular funding as PI from the Canadian Institute of Health Research, the Alberta Heritage Foundation of Medical Research, and the Crohn's and Colitis Foundation of Canada, while running a laboratory in Canada: estimated yearly fundings of 600 kC\$.

- In France: Inserm Atipe-Avenir Bettencourt-Schueller Fondation 2008 (300k€), Schlumberger Foundation 2008 (250 k€), National Research Agency (ANR) 2008 (300 k€), Fondation Aupetit 2010 (30k€), ANR 2010 (200 k€), European Research Council (ERC) Consolidator Award 2013 (2500 k€), ANR 2015 (300k€), Région midi-pyrenees: 300 k€, grant with industry (2010-2018): 500 k€, Région Occitanie-Feder (2017-2021 : 1,800 k€), ANR (2018-2021: 350 k€).

Present funding:

ANR (2020-2024: 350 k€), Fondation pour la recherche Médicale (2019-2022 : 120 k€), Fondation pour la recherche Médicale (2023-2026 : 450 k€), ANR (2022-2025 : 60k€), industry-collaboration grants (2018-2024) : 600 k€, Crohn's & Colitis Foundation (2023-2026) : 300 k€, EIC Pathfinder (EU funds) (2024-2028) : 800 k€, ANR (2025-2029 : 500 k€).

Scholastic Performance:

I have published more than 220 research articles in journals such as Nature Medicine, Science Translational Medicine, Gastroenterology, Gut, Nature Communications, etc. I have written or contributed to the writing of 4 books (Springer Editions, Wiley Editions, CNRS Edition).

I have a **H-index of 73** (Web of Science) and **85** (Google Scholar).

Scientific Societies Membership:

- Past President of the International Association of Inflammation Societies (IAIS), member of the board of the IAIS (2019-2024)
- Vice-President of the Group of Research and Studies on Mediators of Inflammation (GREMI) (2018-2024)
- Member of the Board and of the Steering Committee of the French Group of Neuro-Gastroenterology
- Founding Member of the Schlumberger Foundation for Education and Research
- Member of the American Gastroenterology Association (since 2001)
- Councilor in the executive committee of the Pharmacological Society of Canada (2005-2007)
- Member (2002-2005) and Chair (2005-2008) of the Admission committee of the Canadian Association of Gastroenterology
- Member of the board of the Canadian Association of Gastroenterology (2005-2008)