

François HERICOURT

Associate professor in
molecular biology

Born in May the 20th 1971
French nationality



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DEGREES

June 2022 Associate professor degree (HDR) in Life Sciences
University of Orléans

1995-1999 PhD Thesis in cellular and molecular genetics, *with highest honors*
University Pierre et Marie Curie (Paris 6)

1992-1994 MSc in cellular and molecular genetics, *with highest honors*
University Pierre et Marie Curie (Paris 6)

1989-1992 BSc in cellular biology, option genetics, *with honors*
University Pierre et Marie Curie (Paris 6)

LABORATORY EXPERIENCE

Since 2004 Laboratory of Physiology, Ecology and Environment (P2E), University of Orléans,
France

Supervisor: Dr S. Carpin

Subject: Studies of molecular signaling pathway involved in poplar perception of drought stress

Position: Associate professor

2003-2004 Institute of Insect Biology Research (IRBI), CNRS, Tours, France

Supervisor: Dr J.-M. Drezen

Subject: Studies of the PTP family genes from a DNA virus of a parasitoid wasp

Position: post-doc

2000-2002 Gentech SARL, Sophia Antipolis, Biot, France

CEO: Dr A. Khashoggi

Subject: Research and development in plant molecular virology (viral resistance engineering)

Position: researcher

1995-1999 Institute Jacques Monod, CNRS-University of Paris 7 & Paris 6, Jussieu, Paris,
France

Supervisor: Dr I. Jupin

Subject: Studies of the RNA-dependent RNA polymerase of an RNA virus: the turnip yellow mosaic virus (TYMV)

Position: PhD student

Jan.-Feb. 98 Gorlaeus Laboratories, Leiden, The Netherlands

Supervisor: Dr C.W.A. Pleij

Subject: Purification of the replication complex of an RNA virus from *Arabidopsis thaliana*

Position: PhD student

May 97 John Innes Center, Norwich, England

Supervisor: Dr M. Bevan

Workshop EMBO: «*Arabidopsis* as an experimental organism» (practical course)

Position: PhD student

April-Sept. 94 Institute of Plant Sciences (ISV), CNRS, Gif-sur-Yvette, France

Supervisors: Drs I. Jupin and B. Gronenborn

Subject: Studies of the interaction between viral DNA and Rep protein during tomato yellow leaf curl geminivirus (TYLCV) replication

Position: Master student

Jan.-April 94 Institute of Genetics and Microbiology (IGM), Orsay, France

Supervisors: Drs T. Langin and M.J. Daboussi

Subject: Molecular characterization of the *Impala* transposon in *Fusarium oxysporum*, a phytopathogen

Position: Master student

Sept.-Dec. 93 Centre of Molecular Genetics (CGM), CNRS, Gif-sur-Yvette, France

Supervisor: Dr E. Petrochilo

Subject: Screening for functional homologs of CYP1 gene of *Saccharomyces cerevisiae* in other yeast species

Position: Master student

July-Aug. 93 National Institute of Agronomic Research (INRA), Versailles, France

Supervisors: Drs I. Small and G. Pelletier

Subject: Use of the Representational Differences Analysis (RDA) technics to analyze plant genomes

Position: Master student

COMMUNICATIONS

Seminars

CEFIPRA Workshop (Franco-Indian scientific meeting)

Hôtel Dupanloup, Orléans, 6-8 novembre 2024

"Searching for osmosensing determinants and possible ligands of histidine kinases in poplar: Toward application in plant drought tolerance"

International annual congress of SFBBM

ENS, Lyon, 4-5 july 2024

"Searching for osmosensing determinants and possible ligands of membrane histidine kinases in poplar"

Meeting of RTR MiDi

Hôtel Dupanloup, Orléans, 11th decembre 2023

"ProBioSec project: results presentation"

34^{ème} colloque Biotechnocentre

Ferme de Courcimont, Nouan le Fuzelier, 20-21 octobre 2022

« Caractérisation d'osmosenseurs de peuplier : recherche de domaine fonctionnel »

Day "Gestion innovante des stress abiotiques"

Meeting Végépolys Valley, INRAE Orléans, LBLGC, 27th septembre 2021

"Projet ProBioSec : recherche de biostimulant pour la tolérance des plantes à la sécheresse"

Workshop inter-projects Végépolys Valley : "Innovation pour la transition agro-écologique en région Centre-Val de Loire"

Webinar of pôle de compétitivité, 18th february 2021

“Présentation du projet ProBioSec dans le cadre de la coalition Innov’AgroEco”

Workshop topic Végépolys Valley : “Valorisation des co-produits du bois pour la nutrition et la santé des plantes”

Webinar of pôle de compétitivité, 26th novembre 2020

“Projet ProBioSec : recherche de biostimulant pour la tolérance des plantes à la sécheresse à partir de feuilles de peuplier”

Workshop "Plant stress biology and food security"

ICGEB, New Delhi, India, 18-20 april 2019

Invited speaker: "Perception of drought in poplar: search for osmosensor domain and its ligand"

EMBO Symposium "Sensing and signaling in plant stress response"

Grand Hotel, New Delhi, India, 15-17 april 2019

Invited chairman: Keynote lectures session

7ème congrès de Virologie Végétale Française

Centre CNRS, Aussois, France, 14-18 Mars 1999

"Recherche des facteurs cellulaires impliqués dans la réplication du virus de la mosaïque jaune du navet (TYMV)"

2ème rencontre des virologistes d'Ile-de-France

Institut Pasteur, Paris, 21 Octobre 1997

"Protéine virale cherche partenaire cellulaire pour interactions, plus si affinité. Faux positifs s'abstenir."

6ème congrès de Virologie Végétale Française

Centre CNRS, Aussois, France, 9-13 Mars 1997

"Protéine virale cherche partenaire cellulaire pour interactions, plus si affinité. Faux positifs s'abstenir."

Posters

International annual congress of SFBBM

Faculty of Pharmacy, Paris, 19-20 june 2025

"Search for ligands of plant osmosensor: toward application as biostimulant"

34^{ème} colloque Biotechnocentre

Ferme de Courcimont, Nouan le Fuzelier, 20-21 octobre 2022

« Développement de systèmes de cultures racinaires de peuplier pour l’obtention de molécules bioactives à visée cosmétique »

« Caractérisation phytochimique par HPLC-MS d’extraits de hairy roots de peuplier hybride »

3^{ème} symposium international "Plant Signaling and Behavior"

Paris, France, 29 june-2 july 2015

"Molecular study of a seconde Histidine-aspartate Kinase putatively involved in osmosensing signaling pathway in *Populus*"

Symposium international "Auxin and Cytokinin in Plant Development"

Prague, Czech Republic, 29 june-4 july 2014

"Interconnection between osmosensing and cytokinin signaling pathways in *Populus*"

8ème congrès jeunes chercheurs de la SFBV

Faculté de Pharmacie, Université François Rabelais, Tours, France, 26-27 june 2014

"Interconnection entre les voies de signalisation osmosensing et cytokinine chez le peuplier"

International Symposium of plant biotechnology

BIT, Ranchi, India, 28 september-1^{er} october 2011

"Identification of Histidine-containing Phosphotransfer proteins as potential partners in the *Populus* osmosensing pathway"

23ème colloque Biotechnocentre

Château de Seillac, Seillac, France, 21-22 october 2010

"Etude des interactions protéiques impliquées dans les voies de signalisation osmosensing et cytokinine chez le peuplier"

International congress of FESPB

Palais des congrès, Valencia, Spain, 4-8 july 2010

"Interaction study of proteins involved in osmosensing and cytokinin signaling pathways in *Populus*"

International Conference on Plant Abiotic Stress Tolerance

Vienna University, Austria, 8-11 february 2009

"Is HPT2 from *Populus* able to interconnect different two-component signaling pathways?"

10ème rencontre Biologie Moléculaire des Ligneux

Centre INRA de Nancy, Champenoux, France, 5-7 may 2008

"Perception et transduction du signal de stress hydrique chez le Peuplier"

20ème colloque Biotechnocentre

Château de Seillac, Seillac, France, 25-26 october 2007

"Osmotic stress signal perception and transduction in *Populus*"

7ème colloque national de la SFBV

Palais des congrès, Versailles, France, 12-14 september 2007

"Osmotic stress signal perception and transduction in *Populus*"

7ème congrès de Virologie Végétale Française

Centre CNRS, Aussois, France, 14-18 march 1999

"Recherche d'interaction entre les protéines virales impliquées dans la réplication du virus de la mosaïque jaune du navet (TYMV)"

EMBO Workshop

John Innes Centre, Norwich, England, 5-16 may 1997

"Identification of cellular proteins involved in the replication of turnip yellow mosaic virus (TYMV)"

Publications

29- Bruat M, Heng S, Colas C, Sena-Belez M, Cheddor F, **Héricourt F**, Depierreux C, Morabito D, Malik S, Destandau E, Carpin S, Lamblin F (**2025**) Growth parameter optimization of hybrid poplar (*Populus tremula* x *Populus alba*) hairy root culture for the production of antioxidant specialized metabolites. *Plant Cell, Tissue and Organ Culture*, 161, 31

28- Makhokh H, Busont O, Larcher M, Lamblin F, Cheddor F, Depierreux C, Destandau E, Carpin S, **Héricourt F** (**2025**) A yeast osmotic system as a tool to identify biostimulant for plant drought stress tolerance. *Curr. Plant Biol.* 41, 100430

27- A. Cartereau, Z. Bouchouireb, S. Kaaki, **F. Héricourt**, E. Taillebois, J-Y. Le Questel, S. Thany (**2024**) Pharmacology and molecular modeling studies of sulfoxaflor, flupyradifurone and neonicotinoids on the human neuronal $\alpha 7$ nicotinic acetylcholine receptor. *Toxicology and Applied Pharmacology*, 492, 117123

26- S. Malik, G. Kumaraguru, M. Bruat, F. Cheddor, C. Depierreux, , **F. Héricourt**, S. Carpin, G. Shanmugam, F. Lamblin (**2024**) Organic extracts from sustainable hybrid poplar hairy root cultures as potential natural antimicrobial and antibiofilm agents. *Protoplasma*, 261, 1311-1326

25- M. Laffon, M. Bruat, F. Cheddor, C. Colas, S. Heng, M. Sena-Velez, M. Larcher, **F. Héricourt**, C. Depierreux, D. Morabito, E. Destandau, S. Carpin, S. Malik, F. Lamblin (**2023**) Hairy root induction in hybrid poplar (*Populus tremula* x *Populus alba*) for sustainable growth

and specialized metabolites production with antioxidant activities. *Plant Cell, Tissue and Organ Culture*, 156, 2

- 24- A. Mongès, H. Yaakoub, B. Bidon, G. Glévarec, **F. Héricourt**, S. Carpin, L. Chauderon, L. Drašarová, L. Spichal, B.M. Binder, N. Papon, S. Rochange (2023) Response of the arbuscular mycorrhizal fungus *Rhizophagus irregularis* to ethylene and cytokinins, and characterization of corresponding receptor candidates. *Mol. Plant-Microbe Interact*, Oct 18:MPMI05230056R
- 23- H. Makhokh, P. Lafite, M. Larcher, F. Lamblin, F. Chefdor, C. Depierreux, M. Tanigawa, T. Maeda, S. Carpin, **F. Héricourt** (2023) Searching for osmosensing determinants in poplar Histidine-aspartate Kinases. *Int. J. Mol. Sci.* 24, 6318
- 22- O. Busont, G. Durambour, S. Bernard, C. Plasson, C. Joudiou, L. Baude, F. Chefdor, C. Depierreux, **F. Héricourt**, M. Larcher, S. Malik, I. Boulogne, A. Driouich, S. Carpin, F. Lamblin (2023) Black poplar (*Populus nigra* L.) root extracellular trap, structural and molecular remodeling in response to osmotic stress. *Cells*, 12, 858
- 21- I. Djeghdir, F. Chefdor, L. Bertheau, K. Koudounas, I. Carqueijeiro, P. Lemos Cruz, V. Courdavault, C. Depierreux, M. Larcher, F. Lamblin, **F. Héricourt**, G. Glévarec, A. Oudin, S. Carpin (2021). Evaluation of type-B RRs dimerization in poplar: a mechanism to preserve signaling specificity? *Plant Science* 313, 111068
- 20- B. Bidon, S. Kabbara, V. Courdavault, G. Glévarec, A. Oudin, **F. Héricourt**, S. Carpin, L. Spichal, B. Binder, J.M. Cock, N. Papon (2020). Cytokinin and ethylene cell signalling pathways from prokaryotes to eukaryotes. *Cells* 9, 2526
- 19- **F. Héricourt**, M. Larcher, F. Chefdor, K. Koudounas, I. Carqueijeiro, P. Lemos, V. Courdavault, M. Tanigawa, T. Maeda, C. Depierreux, F. Lamblin, G. Glévarec, S. Carpin (2019) New insight into HPTs as hubs in poplar cytokinin and osmosensing multistep phosphorelays: cytokinin pathway uses specific HPTs. *Plants* 8, 591
- 18- F. Chefdor, **F. Héricourt**, K. Koudounas, I. Carqueijeiro, V. Courdavault, F. Mascagni, L. Bertheau, M. Larcher, C. Depierreux, F. Lamblin, M.L. Racchi, S. Carpin (2018) Highlighting type A RRs as potential regulators of the dkHK1 multi-step phosphorelay pathway in *Populus*. *Plant Science*
- 17- **F. Héricourt**, F. Chefdor, I. Djeghdir, M. Larcher, F. Lafontaine, V. Courdavault, D. Auguin, F. Coste, C. Depierreux, M. Tanigawa, T. Maeda, G. Glévarec, S. Carpin (2016) Functional divergence of poplar Histidine-aspartate Kinase HK1 paralogs in response to osmotic stress. *Int. J. Mol. Sci.* 17, 2061-2078
- 16- L. Bertheau, I. Djeghdir, E. Foureau, F. Chefdor, G. Glévarec, A. Oudin, C. Depierreux, D. Morabito, F. Brignolas, V. Courdavault, **F. Héricourt**, D. Auguin, S. Carpin (2015) Insights into B-type RR members as signaling partners acting downstream of HPT partners of HK1 in the osmotic stress response in *Populus*. *Plant Physiol. Biochem.* 94, 244-252
- 15- L. Bertheau, M. Miranda, E. Foureau, L. Fernanda, R. Hoyos, F. Chefdor, **F. Héricourt**, C. Depierreux, D. Morabito, N. Papon, M. Clastre, G. S. Scippa, F. Brignolas, V. Courdavault, S. Carpin (2013) *In planta* validation of HK1 homodimerization and recruitment of preferential HPT downstream partners involved in poplar multistep phosphorelay systems. *Plant Biosystems* 147, 991-995
- 14- **F. Héricourt**, F. Chefdor, L. Bertheau, M. Tanigawa, T. Maeda, G. Guirimand, V. Courdavault, M. Larcher, C. Depierreux, H. Bénédicti, D. Morabito, F. Brignolas, S. Carpin (2013) Characterization of histidine-aspartate kinase HK1 and identification of Histidine Phosphotransfer proteins as potential partners in a *Populus* multistep phosphorelay. *Physiol. Plant.* 149, 188-199
- 13- C. Serbielle, S. Dupas, E. Perdereau, **F. Héricourt**, C. Dupuy, E. Huguet, J.-M. Drezen (2012) Evolutionary mechanisms driving the evolution of a large polydnavirus gene family coding for Protein Tyrosine Phosphatases. *BMC Evol Biol.* 12, 253

- 12- L. Bertheau, F. Cheddor, G. Guirimand, V. Courdavault, C. Depierreux, D. Morabito, F. Brignolas, **F. Héricourt**, S. Carpin (**2012**) Identification of five B-type response regulators as members of a multistep phosphorelay system interacting with histidine-containing phosphotransfer partners of *Populus* osmosensor. *BMC Plant Biol.* 12, 241
- 11- G. Guirimand, A. Guihur, O. Ginis, P. Poutrain, **F. Héricourt**, A. Oudin, A. Lanoue, B. St-Pierre, V. Burlat, V. Courdavault (**2011**) The subcellular organisation of the strictosidine biosynthesis in *Catharanthus roseus* epidermis points out several trans-tonoplast translocations of intermediate metabolites. *FEBS J.* 278, 749-763
- 10- G. Guirimand, A. Guihur, P. Poutrain, **F. Héricourt**, S. Mahroug, B. St-Pierre, V. Burlat and V. Courdavault (**2011**) Spatial organization of the vindoline biosynthetic pathway in *Catharanthus roseus*. *J. Plant Physiol.* 168, 549-557
- 9- A. Jakubiec, V. Tournier, G. Dugeon, S. Pflieger, L. Camborde, J. Vinh, **F. Héricourt**, V. Redecker and I. Jupin (**2006**) Phosphorylation of viral RNA-dependent RNA polymerase and its role in replication of a plus-strand RNA virus. *J. Biol. Chem.* 281, 1236-49
- 8- A. Jakubiec, J. Notaise, V. Tournier, **F. Héricourt**, M. Block, G. Dugeon, L. van Aelst and I. Jupin (**2004**) Assembly of the Turnip yellow mosaic virus (TYMV) replication complex: interaction between the proteinase and polymerase domains of the replication proteins. *J. Virol.* 78, 7945-57
- 7- D. Colinet, **F. Héricourt**, C. Grevesse, S. Déret, A.G. Castillo, E.R. Bejarano and A. Khashoggi (**2001**) A novel and environmentally friendly approach to viral resistance: Gentech's strategies to control TYLCV infection. *Agro-F-Ind Hi-Tech.* 12, 33-35
- 6- **F. Héricourt**, S. Blanc, V. Redecker and I. Jupin (**2000**) Evidence for phosphorylation and ubiquitinylation of the turnip yellow mosaic virus RNA-dependent RNA polymerase domain expressed in a baculovirus-insect cell system. *Biochem J.* 349, 471-425
- 5- **F. Héricourt** and I. Jupin (**1999**) Molecular cloning and characterization of the *Arabidopsis thaliana* a-subunit elongation factor 1B. *FEBS Lett.* 464, 148-152
- 4- **F. Héricourt**, I. Jupin and A-L. Haenni (**1999**) The genome of plant RNA viruses. In the Molecular Biology of Plant Viruses, *Kluwer Academic Publishers*, Norwell, MA, USA, 1-28
- 3- **F. Héricourt** et I. Jupin (**1999**) Infection d'*Arabidopsis thaliana* par le virus de la mosaïque jaune du navet (TYMV). *Virologie.* 3, 133-134
- 2- A. Hua-Van, **F. Héricourt**, P. Cappy, M-J. Daboussi and T. Langin (**1998**) Three highly divergent subfamilies of the *impala* transposable element coexist in the genome of the fungus *Fusarium oxysporum*. *Mol. Gen. Genet.* 259, 354-362
- 1- I. Jupin, **F. Héricourt**, B. Benz and B. Gronenborn (**1995**) DNA replication specificity of TYLCV geminivirus is mediated by the amino-terminal 116 amino acids of Rep protein. *FEBS Lett.* 362, 116-120

Patents

D. Colinet, J.R. Iniesta, **F. Héricourt**, C. Grevesse, A.G. Castillo, I.C. Donoso, and E.R. Bejarano
 Purified polynucleotide sequences of plants and yeast coding for proteins interacting with the products of geminivirus genome
National reference FR2806095 (2000) & international WO01/68863 (2001)

PROFESSIONAL

Technics

Molecular biology: two-hybrid, cloning, PCR, GST pull-down...

Biochemistry: expression, purification and analysis of proteins (WB, IP...)

Microbiology: handling of bacteria (*E. coli*) and yeast (*S. cerevisiae*)

Languages

English: C1

Italian: B1

German: A1

Computer skill

Mac, biological softwares (Blast, Clustal O, DNA Strider...)

Treatment of images and text (Word, Excel, PowerPoint, Photoshop,...)

Webmaster for the lab and life science department

Fellowships

Grant from Région Centre Val de Loire for my research project (4 years)

Grant from the government for my PhD thesis (3 years)

FEBS Short-term fellowship for European exchange (2 months)

ARC Fellowship for my last PhD year (6 months)

Students supervision

PhD: 2009-2013 / 2013-2016 / 2020-2023

Master 2: 2015 / 2022 / 2024

Master 1: 2005 / 2006 / 2008 / 2009 / 2010 / 2013 / 2016 / 2019 / 2020 / 2025

License 3: 2010 / 2014 / 2017 / 2023 / 2024 / 2025

BTS 2 / IUT 2: 2009 / 2021 / 2023 / 2024

BTS 1: 2022 / 2023

Technician: since 2006

Reviewer

For international journals:

- Planta / Plants / SDRP Journal of Plant Science / Frontiers in Plant Science

- International Journal of Molecular Sciences / Genes

- Horticulturae / Agronomy

For PhD thesis:

P. Châtelain, UMR AgroEco, Dijon, 15/12/2022

For national project:

AAP Carnot I2C 2021

PERSONAL

Travels: USA, Canada, England, Scotland, The Netherlands, Belgium, Hungary, Germany, Austria, Czech Republic, Switzerland, Italy, Spain, Portugal, Greece, Malta, Egypt, India, Thailand, Vietnam, Cambodia

Hobbies: writer and editor of poetry for children (Editions LiFan, 2004-2010)

Else: driving licence since 1990