

Yvinec Romain
23/10/1985
French

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<http://yvinec.perso.math.cnrs.fr/>

Professional situation

2013- | Research Associate (Chargé de Recherche) at INRA
BIOS group (http://bios.tours.inra.fr/bios_group)
UMR85 Physiologie de la Reproduction et des Comportements
F-37380 Nouzilly, France

Research subject

Mathematics | Stochastic process, limit theorem, long time behavior, piecewise deterministic process, bifurcation, waiting time. Adiabatic reduction. Metastability.

Modelisation | Probabilistic models in biology. Gene expression model, protein aggregation model, coagulation-fragmentation, population dynamic.

Biology | Cellular and molecular biology. Signaling systems. Reproduction biology.

Responsability and Scientific animation

2017- | co-animation of the GT Biophysique, Biomathématiques et Bioinformatique pour la reproduction, GDR CNRS 3606 Repro.

2016- | co-animation of the network CaSciModOT (Scientific calculus and modelisation Orléans-Tours)

Fundings and awards

2018-2019 | Crédits Incitatifs PHASE : MSBFOLLICULO, vers une biologie systémique multi-échelle : intégration du réseau de signalisation FSH dans un modèle multi-échelle de la folliculogénèse

2018 | Agreenium support for a doctorate course : Modélisation de systèmes dynamiques en agronomie, écologie et biologie moléculaire

2016-2017 | Actions de Recherches Collaboratives Université de Tours et de Poitiers : Modélisation stochastique et analyse statistique en expression génétique

2016 | Crédits Incitatifs PHASE : TRADUCTOPHENO, prédire le phénotype cellulaire à la lumière du traductome

Conferences organization

2019 | *Special Session co-organizer at the Journées ReproSciences 2019.*
Biophysique, Biomathématiques et Bioinformatique pour la reproduction
Toulouse (France), April 24-26 2019

2018 | *Cascimodot Workshop.*
28e journée du projet CaSciModOT
Tours (France), June 21 2018
Modélisation stochastique et analyse statistique en biologie
Tours (France), May 23/25 2018

2017 | *PDMPs, Theory and applications .*
Seillac (France), 29-June 2 2017
Special Session co-organizer at the Journées ReproSciences 2017.
Biophysique, Biomathématiques et Bioinformatique pour la reproduction
Tours (France), April 10-12 2017
Modélisation stochastique et analyse statistique de l'expression génétique.
Poitiers (France), January 5 2017

- 2016 | *4th young researcher Workshop of the GDR3545.*
 Building GPCR signalisation networks. Example of the FSH receptor
 Tours (France), November 21-22 2016
Special Session at the Journées MAS'16.
 PDMP pour la biologie
 Grenoble (France), August 29-31 2016
Cascimodot Workshop.
 24e journée du projet CaSciModOT
 Tours (France), June 17 2016

Abroad research stay

- March-May 2016 | Isaac Newton Institute, Cambridge England. Stochastic Dynamical Systems in Biology : Numerical Methods and Applications.
 Feb.-Aug. 2015 | Institute of Computational Biology, Helmholtz Zentrum Munich, Germany. Collaboration with Jan Hasenauer's group.
 January 2014 | CI2MA, Universidad de Concepción, Chile. Collaboration with E. Hingant.
 Nov.-April 2013-2014 | Mathematics Center Heidelberg, Heidelberg University, Germany. Collaboration with Anna Marciniak-Czochra's group.
 March-Aug. 2011 | Centre for Applied Mathematics in Bioscience and Medicine, McGill University, Montreal, Canada.
 March-Aug. 2010 | Centre for Applied Mathematics in Bioscience and Medicine, McGill University, Montreal, Canada.

Peer review journal

- 2011 | *Molecular Distributions in Gene Regulatory Dynamics,*
 Michael C. Mackey, Marta Tyran-Kaminska and Romain Yvinec,
 J Theor Biol. (2011) 274(1) :84-96. DOI :10.1016/j.jtbi.2011.01.020
- 2012 | *First passage times in homogeneous nucleation and self-assembly,*
 Romain Yvinec, Maria D'Orsogna, and Tom Chou,
 J Chem Phys. (2012) 137 :244107 DOI :10.1063/1.4772598
- 2013 | *Dynamic behavior of stochastic gene expression models in the presence of bursting,*
 Michael C Mackey, Marta Tyran-Kaminska, Romain Yvinec,
 SIAM J. Appl. Math. (2013), 73(5), 1830-1852., DOI :10.1137/12090229X
- 2014 | *Adiabatic reduction of a model of stochastic gene expression with jump Markov process,*
 Romain Yvinec, Changjing Zhuge, Jinzhi Lei and Michael C. Mackey,
 J Math Biol (2014), 68(5) :1051-70 DOI :10.1007/s00285-013-0661-y
- 2016 | *First passage times in homogeneous nucleation : dependence on the total number of particles,*
 Romain Yvinec, Samuel Bernard, Erwan Hingant, Laurent Pujo-Menjouet,
 The Journal of Chemical Physics (2016), 144(3) :034106, DOI :10.1063/1.4940033
Computational modeling approaches in gonadotropin signaling,
 Mohammed Akli Ayoub, Romain Yvinec, Pascale Crépieux, Anne Poupon,
 Theriogenology (2016), 86(1) :22–31, DOI :10.1016/j.theriogenology.2016.04.015
Profiling of FSHR negative allosteric modulators on LH/CGR reveals biased antagonism with implications in steroidogenesis,
 Mohammed Akli Ayoub, Romain Yvinec, Gwenhael Jégot, James A. Dias, Sonia-Maria Poli,
 Anne Poupon, Pascale Crépieux, Eric Reiter
 Molecular and Cellular Endocrinology (2016), 436 :10–22, DOI :10.1016/j.mce.2016.07.013
- 2017 | *Quasi steady state approximation of the small clusters in Becker-Döring equations leads to boundary conditions in the Lifshitz-Slyozov limit ,*

Julien Deschamps, Erwan Hingant, Romain Yvinec,
Communications in Mathematical Sciences, 15(5) :1353–1384 DOI : 10.4310/CMS.2017.v15.n5.a7

β -arrestin signalling and bias in hormone-responsive GPCRs,

Eric Reiter, Mohammed Akli Ayoub, Lucie P. Pellissier, Flavie Landomiel, Astrid Musnier, Aurélie Tréfier, Jorge Gandia, Francesco De Pascali, Shifa Tahir, Romain Yvinec, Gilles Bruneau, Anne Poupon, Pascale Crépieux.,

Molecular and Cellular Endocrinology, 449 :28–41 DOI : 10.1016/j.mce.2017.01.05

Human Luteinizing Hormone and Chorionic Gonadotropin Display Biased Agonism at the LH and LH/CG Receptors,

Laura Riccetti, Romain Yvinec, Danièle Klett, Nathalie Gallay, Yves Combarous, Eric Reiter, Manuela Simoni, Livio Casarini, Mohammed Akli Ayoub.,

Scientific Reports, 7(940) DOI : :10.1038/s41598-017-01078-8

2018 *Advances in computational modeling approaches in pituitary gonadotropin signaling ,*

Romain Yvinec, Pascale Crépieux, Eric Reiter, Anne Poupon, Frédérique Clément,
Expert Opinion on Drug Discovery, 13(9) :799–813, DOI : 10.1080/17460441.2018.1501025

2019 *Biased Signaling and Allosteric Modulation at the FSHR ,*

Flavie Landomiel, Francesco De Pascali, Pauline Raynaud, Frédéric Jean-Alphonse, Romain Yvinec, Lucie P. Pellissier, Véronique Bozon, Gilles Bruneau, Pascale Crépieux, Anne Poupon and Eric Reiter,

Frontiers in Endocrinology, 10, DOI : 10.3389/fendo.2019.00148

Analysis and calibration of a linear model for structured cell populations with unidirectional motion : Application to the morphogenesis of ovarian follicles ,

Frédérique Clément, Frédérique Robin, Romain Yvinec,

SIAM Journal on Applied Mathematics, 79(1) :207–229 DOI : 10.1137/17M1161336

Book Chapter

2016 *Coupling of recognition and effect in GPRC signaling computational modelling approaches,*

Eric Reiter, Romain Yvinec, Pascale Crépieux, Anne Poupon,

In : Encyclopedia of the molecular life sciences (p. In press)

2017 *Deterministic and Stochastic Becker-Döring equations : Past and Recent Mathematical Developments,*

Erwan Hingant, Romain Yvinec.

In : Holcman D. (eds) Stochastic Processes, Multiscale Modeling, and Numerical Methods for Computational Cellular Biology. Springer, Cham. DOI : 10.1007/978-3-319-62627-7_9 arXiv :1609.00697

2018 *Workflow description to dynamically model β -arrestin signaling networks ,*

Romain Yvinec, Mohammed Akli Ayoub, Francesco De Pascali, Pascale Crépieux, Eric Reiter, and Anne Poupon,

In : Mark G H Scott, Stephane A. Laporte (eds) Beta-Arrestins : Methods and Protocols, Methods in Molecular Biology, 1957 :(195–215), Springer Science+Business Media, LLC, part of Springer Nature DOI : 10.1007/978-1-4939-9158-7s.

2019 *Follicle-stimulating hormone receptor : Advances and remaining challenges,*

Francesco De Pascali, Aurélie Tréfier, Flavie Landomiel, Véronique Bozon, Gilles Bruneau, Romain Yvinec, Anne Poupon, Pascale Crépieux, Eric Reiter,

In : Arun K. Shukla (ed.), dir., G Protein-Coupled Receptors : Emerging Paradigms in Activation, Signaling and Regulation Part A (p. 1-58). International Review of Cell and Molecular Biology, 338 (1ère ed.). USA : Elsevier. 171 p., DOI :10.1016/bs.ircmb.2018.02.001

Conference journal

- 2015 | *From Becker-Döring to Lifshitz-Slyozov : deriving the non-local boundary condition of a non-linear transport equation*,
Romain Yvinec, Julien Deschamps, Erwan Hingant,
In : Workshop on Multiscale and Hybrid Modelling in Cell and Cell Population Biology. Les Ulis (FRA) : EDP Sciences (ITM Web of Conferences, 5), 2015.
DOI :10.1051/itmconf/20150500017
- 2017 | *Probabilistic and Piecewise Deterministic models in Biology*,
B Cloez, R Dessalles, A Genadot, F Malrieu, A Marguet, R Yvinec.,
In : ESAIM : Procs 60 :225–245, Journées MAS 2016 de la SMAI – Phénomènes complexes et hétérogènes, 2017. DOI :10.1051/proc/201760225

Preprint

- 2019 | *Multiscale population dynamics in reproductive biology : singular perturbation reduction in deterministic and stochastic models* ,
Celine Bonnet, Keltoum Chahour, Frédérique Clément, Marie Postel, Romain Yvinec.
arXiv :1903.08555
- Stochastic nonlinear model for somatic cell population dynamics during ovarian follicle activation* ,
Frédérique Clément, Frédérique Robin, Romain Yvinec.
arXiv :1903.01316
- 2018 | *The Becker-Döring process : law of large numbers and non-equilibrium potential*
Erwan Hingant, Romain Yvinec.
arXiv :1807.11770

Thesis

- 2012 | *Stochastic modelling in molecular and cellular biology*,
Romain Yvinec
<http://tel.archives-ouvertes.fr/tel-00749633>.

Thesis Student Supervision

- 2016–2019 | Frédérique Robin (Thèse CORDI-S (INRIA, 2016-2019) en co-direction avec Frédérique Clément (INRIA Paris))
Modeling and analysis of cell population dynamics : application to the early development of ovarian follicles

Master Student Supervision

- 2019 | Clara Bou Rouphael (Stage M2, Université d’Aix-Marseille)
Coupling biochemical reaction networks with cell population dynamics : application to reproductive biology.
- 2018 | Céline Bonnet and Keltoum Chahour (Ph.D. students, supervision of a research project) at the CEMRACS 2018
Multiscale population dynamics in reproductive biology : singular perturbation reduction in deterministic and stochastic models
Marion Deffarges (Stage M1, Université Poitiers)

- Estimation paramétrique de modèles de signalisation cellulaire - Application au calcul de biais des RCPG.
- 2017 Hamza Ouchene (Stage M1, Université Poitiers)
Analyse statistique de données de protéomes. Application au réseau FSH..
- Remi Coulaud (Stage Magistère, Université Toulouse 1)
Analyse statistique de données de transcriptome et traductome. Application au réseau FSH..
- 2016 Frédérique Robin (Stage M2, Université Paris-Saclay, en co-direction avec Frédérique Clément (INRIA Paris))
Étude du comportement en temps long de modèles d'évolution de populations cellulaires au cours du développement de follicules ovariens
- Erwan Quilly (Stage M1, Université Poitiers)
Inférence du biais de signalisation pour des modèles de réseaux de signalisation cellulaire.

Thesis committee

- 2018 Gabriel LAGASQUIE (Université François - Rabelais de Tours)
Etude du comportement en temps long de processus de markov déterministes par morceaux
- Ulysse Herbach (Université Claude Bernard Lyon 1)
Modélisation stochastique de l'expression des gènes et inférence de réseaux de régulation

Oral communication

- 2019 Workshop ATMOSHBASE
Paris (France), March 22 2019
- BioHasard 2019
Rennes , August 26-29 2019
- 2018 Reverse mathematical methods for reconstructing molecular dynamics in single cell
Pisa (Italy), October 15-19 2018
- ICSB 2018
Lyon October 28 - November 1 2018
- 2017 Workshop on Protein Aggregation : Biophysics and Mathematics
Vienna (Austria), June 6-8 2017
- ODE Modelling in Systems Biology
Freiburg (Germany) September 19-22 2017
- Session du GDR Mamovi 2017
Lyon (France), September 27-29 2017
- 2016 2nd BCAM Workshop on Nonlinear Dynamics in Biological Systems
Bilbao (Spain), September 1-2 2016
- 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications
Orlando (Florida US), July 1-5 2016
- 2015 CaSciModOT
Orléans, December 2015.

- Design, Optimization and Control in Systems and Synthetic Biology
ENS Paris, November 12-13 2015.
- Colloque PDMP 9-10 Novembre 2015
Université François Rabelai, Tours (France) November 9-10 2015
- SMAI 2015
Les Karellis June 8-12 2015.
- Colloque PDMP 18-21 mai 2015
Saint Martin de Londres (France) May 18-21 2015
- Workshop Multiscale and hybrid modelling in cell and cell population biology,
Laboratoire Jacques-Louis Lions , UPMC (Paris) March 16-17 2015.
- BIOMAT 2015,
Cabo Frio (Brazil) March 2-7 2015.
- Short-course on PDMP, applications in Biology
Laboratoire Jacques-Louis Lions, UPMC (Paris) January 2015
- 2014 9th European Conference on Mathematical and Theoretical Biology,
Chalmers University of Technology (Göteborg), 15-19 Juin 2014.
- Workshop "Structured Integro-Differential models in Mathematical Biology",
Institut Pauli Wolfgang (Vienna), 23-25 Avril 2014
- 2012 Workshop "Dynamique des populations cellulaires",
Institut Pasteur de Tunis du 26-28 novembre 2012.
- Journées Modélisation Mathématiques et Calcul Scientifique,
Campus de La Doua, Villeurbanne, 5-6 Septembre 2012.
- Journées de probabilités 2012,
station biologique de Roscoff, 18-22 Juin 2012.
- 2011 5th International Conference on Stochastic Analysis and its Applications (IC-
SAA 2011),
Bonn, Allemagne, 5-9 Septembre 2011.
- 2010 First International workshop on Differential and Integral Equations with Ap-
plications in Biology and Medicine (DIEBM 2010),
Aegean University, Karlovassi, Samos island, Grèce, (7-10 septembre 2010).
- Annual Meeting of the Society for Mathematical Biology (SMB 2010),
Rio de Janeiro, Brazil 26-29 Juillet 2010.

Poster

- 2019 REPROSCIENCES 2019 ,
Toulouse, April 24-26, 2019.
- 2014 Stochastic Biology : from Cells to Populations,
IST Austria, Klosterneuburg, Austria, 5-7 Mai 2014
- 2011 7th International Congress on Industrial and Applied Mathematics (ICIAM
2011),
Vancouver, BC, Canada 18-22 Juillet 2011.
- PRION 2011 congress (PRION 2011),
Montreal, Qc, Canada 16-19 Mai 2011.
- 2010 11th International Conference on Systems Biology, (ICSB 2010),
Edinburgh, Scotland 10-15 Octobre 2010.

Seminar

- 2018 | CEMRACS 2018
Luminy (France), July 27 2018
- 2016 | Seminar Isaac Newton Institute, Program : Stochastic Dynamical Systems in
Biology : Numerical Methods and Applications ,
Cambridge (UK), March 16 2016.
Groupe de travail Bio-Maths Tours/Orléans
Tours, December 14 2016
- 2015 | Séminaire INRIA Lyon,
Lyon, 26 Novembre 2015.
Séminaire du Laboratoire de Mathématiques et Physique Théorique,
Tours, 23 Octobre 2015.
Seminar of the Institute of Computational Biology,
Munich, March 2015.
- 2014 | BIOQUANT Seminar
Heidelberg.
- 2013 | Séminaire du Laboratoire de Mathématiques Appliquées de Compiègne,
Compiègne, 12 février 2013.
GT Maths bio et santé, Laboratoire Jacques-Louis Lions,
Paris, 11 février 2013.
- 2011 | Ph.D seminar of the Centre de Mathématiques Appliquées de polytechnique (
CMAP),
Paris, 7 Décembre 2011.
- 2010 | Mathematical Biology Seminar Series at the Center for Mathematical Biology,
University of Alberta,
Edmonton, Canada, 29 Mars 2010.
CAMBAM Seminar Series, at the Centre for Applied Mathematics in Bioscience
and Medicine, McGill University,
Montreal, Canada 22 Avril 2010.

Working group

- 2019– | Réseau INRA MIA, Aléatoire en Agronomie .
2016– | Groupe de travail Bio-Maths, Institut Denis Poisson Tours-Orléans.
2015-16 | Groupe de travail EDP/Probas, Jussieu, Paris VI.
2012 | Biomath group of ENS Lyon-Université Lyon 1.
2010 | McGill Biophysical Chemistry Symposium, McGill University, Montreal, Ca-
nada.
2009 | Biomath group at laboratoire Institut Camille Jordan, Université Lyon 1.

Other Conferences attended

- 2015 | Neurosciences à Nouzilly, October, 13 2015
2014 | 3rd annual meeting of the GDR 3545 Meeting at Montpellier, October, 20-22
2014 | International Conference on Gonadotropins and Receptors (ICGRIII-2014) at
Tours, September, 7-10 2014
2013 | 2nd annual meeting of the GDR 3545 Meeting, at Strasbourg October, 14-16
2013

2012	Inra-Inria seminar at Sophia-Antipolis, September, 11-12 2013 Journées MAS 2012 at Clermont-Ferrand, 29-31 Août 2012. Journées PDMP 2012 at Marne-la-Vallée, 26-28 Mars 2012 .
2011	Chance at the heart of the cell at La Doua, LYON 21-23 Novembre 2011.
2010	Integrative Post-Genomics at La Doua, LYON 25-26 Novembre 2010.

Summer School

2012	Modélisation en dynamique des populations et Évolution, Probabilités et EDP, organised by the CMAP and INRIA Lyon, La Londe-les Maures, 6-14 Septembre 2012.
2010	The Helsinki Summer School on Mathematical Ecology and Evolution 2010 (EMS-ESMTB School in Applied Mathematics), organised by the Biomathematics Group of the University of Helsinki, à Turku, Finland 22-29 Août 2010. Nonlinear Dynamics in Biological Networks, organised by the Centre for Applied Mathematics in Bioscience and Medicine, McGill University, Montreal, Canada et le Mathematical Biosciences Institute, Ohio State University, Columbus, United States, 25 Juillet-05 Août 2010.
2007	Ecole d'Été de Biologie, organised by Etienne Pardoux at the CIRM, Luminy, France.

Teaching experience

2018–2019	Modélisation de systèmes dynamiques en agronomie, écologie et biologie moléculaire (Doctorate course with Sten Madec, Florent Malrieu, Bertrand Méda, Christelle Robinet, Léopoldo Sanchez-Rodriguez, Christelle Suppo)
2017–2018	Mathematics and statistic for biology (18h TD, L2 Biology, U. Tours)
2016–2017	Mathematics and statistic for biology (18h TD, L2 Biology, U. Tours)
2015–2016	Mathematics and statistic for biology (30h TD, L1 and L2 Biology, U. Tours)
2011–2012	Transport equation in biology (12h lecture, M2 SITN, U. Lyon 1)
2011–2012	Ordinary Differential Equation (18h TD, L2 math MASS, U. Lyon 1)
2011–2012	Measure theory and Lebesgue integrals (24h khôlles, L3 math, U. Lyon 1)
2010–2011	Basic mathematical techniques for physicist (36h TD, L1 PCSI, U. Lyon 1)
2010–2011	Advanced mathematics III (Analyse) (24h khôlles, L3 math, U. Lyon 1)
2010–2011	Mathematics tools for biologist (21h TT, L1 Sciences du Vivant, U. Lyon 1)
2010–2011	Modelization and ODE (12h TP, 3e année Bio-info et Modélisation, INSA Lyon)

Administrative activities

2009–2012	Representative of Ph.D. students at 'Ecole Doctorale InfoMaths, ED 512, Université Lyon 1.
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Reviewer

2019	SIAM Journal on Scientific Computing
2018	Journal of Mathematical Biology, Journal of Theoretical Biology, Scientific Reports, Mathematical Reviews (Mathscinet)
2017	J. R. Soc. Interface, Journal of Mathematical Biology, Scientific Reports, Mathematical Reviews (Mathscinet)
2016	SIAM Journal on Applied Mathematics, Journal of Mathematical Biology, Journal of Theoretical Biology, BMC system biology, Scientific Reports
2015	Journal of Theoretical Biology,
2014	Bulletin of Mathematical Biology, Mathematical Methods in the Applied Sciences,
2012	Journal of Theoretical Biology,
2011	Journal of Theoretical Biology,
2010	Bulletin of Mathematical Biology,

Vulgarization

2016	Conferences in Lycée Descartes (CPGE).
2009–2012	Animations (MathàLyon) for high school student.

Education

2009-2013	Ph.D. of Mathematics at the Université de Lyon, directed by Laurent Pujo-Menjouet (Institut Camille Jordan, Université Lyon 1) Mostafa Adimy (Institut Camille Jordan, INRIA) Michael C. Mackey (Centre for Applied Mathematics in Bioscience and Medicine, McGill University). obtained on October 5th 2012, in front of the examination board Mostafa ADIMY Dr (INRIA) Supervisor Michael C. MACKEY Dr (Mc Gill University) Supervisor Laurent PUJO-MENJOUET MCF (Université Lyon 1) Supervisor Ionel S. CIUPERCA MCF (Université Lyon 1) Oral examiner Sylvie MÉLÉARD Pr (École Polytechnique) President Marta TYRAN-KAMIŃSKA Pr (University of Silesia) Oral examiner Sophie MERCIER Pr (Université de Pau) Manuscript examiner Bernard YCART Pr (Université de Grenoble) Manuscript examiner
2008	Success at the concours of « agrégation » of Mathematics, rank 17th.
2006–2008	Master's degree of Mathematics and applications, École Normale Supérieure de Lyon, France. Obtained with good honors.
2005–2006	Licence of Mathematics (Equivalent to a Bachelor of science in Mathematics), École Normale Supérieure de Lyon, France. Obtained with very good honors.
2005	Admitted to École Normale Supérieure de Lyon.
2003–2005	Scientific preparatory school, Centre Internationale de Valbonne, Sophia-Antipolis, France.
2003	Scientific high school certificate, Lycée Carnot, Cannes, France. Obtained with very good honors.

Informatics skills

Language	C, Python, R
Software	Maple, Matlab, Scilab.

Foreign language

English	fluently.
Spanish	bilingual.