Sébastien Benzekry

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French
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Head of the Inria - Inserm team COMPO
Inria Côte d'Azur
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Appointments

2024 -	Research Scientist (CRHC) at Inria Côte d'Azur, head of the Inria-Inserm team COMPO (COMPutational modeling in pharmacology and clinical Oncology).
2020 - 2024	Research Scientist (CRCN) at Inria Côte d'Azur, head of the Inria-Inserm team COMPO (COMPutational modeling in pharmacology and clinical Oncology).
2015 - 2020	Research Scientist (CR1) at Inria Bordeaux Sud-Ouest, MONC (Modeling in ON-Cology) team.
2013 - 2015	Research Scientist (CR2) at Inria Bordeaux Sud-Ouest, MONC (Modeling in ON-Cology) team.
2017 - 2022	Affiliate Assistant Professor, Biomedical Sciences Department, Iowa State University, USA

Education

2017	"Doctoral supervision habilitation" (HDR). French equivalent of appointment as associate professor. University of Bordeaux.
2012	Postdoctoral fellow, Center of Cancer and Systems Biology at Tufts University, Boston, USA (supervision P. Hahnfeldt).
2008 - 2011	Doctorate of applied mathematics Department of Analysis, Topology and Probabilities and Department of Pharmacokinetics and Toxicokinetics, Aix-Marseille University *Modeling, mathematical and numerical analysis of anti-cancerous therapies for metastatic cancers*
2008	Laureate of the Agregation of mathematics, option Scientific calculus.
2007 - 2009	Student at the Ecole Normale Supérieure (ENS) of Cachan.
2004 - 2007	Mathematics magister at the ENS of Paris.
2004 - 2006	Bachelor and Master 1 degrees of Mathematics, ENS Paris.

Research interests

Applied mathematics to cancer research, including :

- Data science in oncology

- Mathematical modeling of metastatic dissemination and colonization

- Pharmacometrics

- Systemic tumor-tumor interactions and dormancy

- Tumor growth modeling and forecast

Publications

see http://benzekry.perso.math.cnrs.fr/recherche.html
or https://scholar.google.fr/citations?user=xsLpdFAAAAAJ&hl=fr&oi=ao

Foreign research visits

Fall 2016	Short sabbatical at the **Roswell Park Cancer Institute** (J. Ebos' lab), Buffalo, NY, USA
	Stay at the **Integrated Mathematical Oncology** department of the Moffitt Cancer Center, Tampa, FL, USA
September 2015	**Mathematical Oncology Laboratory (Môlab)**, Ciudad Real, Spain. Collaboration with V. Pérez-Garcia and A. Martinez-González
May 2011	Instituto di Analisi dei Sistemi ed Informatica "Antonio Ruberti", Consiglio Nazionale delle Ricerche, Rome. Collaboration with A. Gandolfi et A. d'Onofrio

Oral communications

see http://benzekry.perso.math.cnrs.fr/recherche.html

Postdoctoral fellows

2022 - 2024	Paul Dufossé (Institut Laennec, AMU) : "Quantitative modeling and machine learning for prediction of the response to immunotherapy in lung cancer". Current position : data scientist at ID-solutions oncology.
2020 - 2022	Kevin Atsou (INCa project QUANTIC) : "Quantitative modeling and machine learning for prediction of the response to immunotherapy in lung cancer". Current position : postdoc at Pfizer.
2019 - 2020	Arturo Alvarez-Arenas Alcami (INCa project "Systems biology of renal cell carcinoma")
2018 - 2019	Cecile Taing (INCa project "Systems biology of renal cell carcinoma")
2015 - 2017	Diane-Charlotte Imbs (Amidex MARS project), co-supervision with Dominique Barbolosi and Joseph Ciccolini. Current position : Clinical pharmacologist for early drug development oncology, Ipsen innovation
2015 - 2017	Raouf El Cheikh (Amidex MARS project), co-supervision with Dominique Barbolosi. Current position : Modeling and simulation, Sanofi

Engineers

2024	Romain Zakrasjek (SChISM)
2024 - 2025	Andrea Vaglio (RHU LUCA-pi)
2023 - 2024	Andrea Vaglio (RHU PIONeeR)
2023	Mohamed Boussena (INCa project QUANTIC) : "Quantitative modeling and machine learning for prediction of the response to immunotherapy in lung cancer"
2021 - 2023	Mélanie Karlsen (INCa project QUANTIC) : "Quantitative modeling and machine learning for prediction of the response to immunotherapy in lung cancer"

PhD students

* indicates that I am the main supervisor implicated in the co-supervision.

2023 - 2026	Anastasiia Bakhmach (PEPR Santé Numérique DIGPHAT) : "Modelling and statistical learning for pharmacology in oncology", co-supervision* with R. Fanciullino (COMPO, APHM) and S. Garciaz (IPC)
2023 - 2026	Mohamed Boussena (Institut Laënnec, AMU) : "Machine learning methods for clinical oncology data : application to the prediction of immunotherapy response in lung cancer", co-supervision* with J. Josse (Premedical, Inria) and L. Greillier (COMPO, APHM)
2023 - 2026	Hafida Hamdache : "Amelioration de l'efficacite therapeutique et gestion des effets secondaires et des séquelles du cancer pédiatrique grâce à des programmes nutritionnels améliorés et personnalisés par des simulations informatiques", co-supervision with V. Pancaldi (CRCT)
2022 - 2025	Linh Nguyen : "Mechanistic modeling of circulating DNA combined to machine learning for prediction of response and survival following immunotherapy", co-supervision* with S. Salas (COMPO, APHM)
2020 - 2023	Célestin Bigarré : "Mathematical modeling and prediction of clinical metastatic relapse", co-supervision* with Xavier Muracciole (COMPO, APHM)
2017 - 2020	Cristina Vaghi : "Improving intra-tumor drug distribution of anti-cancer nanoparticles by data-informed mathematical modeling", co-supervision* with Clair Poignard (Inria MONC) and Raphaelle Fanciullino (APHM), then pharmacometrician at In Silico trials
2016 - 2019	Chiara Nicolò : "Mathematical modeling of systemic aspects of cancer and cancer therapy", co-supervision* with Olivier Saut (Inria MONC, CNRS). Then pharmacometrician at In Silico trials
2013 - 2015	Etienne Baratchart : "Quantitative study of the metastatic process using mathematical modeling", co-supervision* with Thierry Colin (Inria MONC, U. Bordeaux) and Olivier Saut (Inria MONC, CNRS). Then postdoc in the Integrative Mathematical Oncology department of the Moffitt Cancer Center, Tampa, FL, USA

2018 - 2021. Expert of the national multi-thematic institute (ITMO) Cancer of Aviesan (Alliance nationale pour les sciences de la vie et la Santé)

Organization of events

March 2012 - Member of the organization committee of the winter school "Current challenges of mathematics in oncology and cancer biology"

Reviewing

- Editor, Mathematical Biosciences and Engineering

- Reviewer for grant applications submitted to the Austrian Science Fund, the Centre d'Excellence Africain en Technologies de l'Information et de la Communication and the TEAM program (European Union and Foundation for Polish Science)

- Invited editor of a special issue for the journal Complexity : "Mathematical Oncology : Unveiling Biological Complexity Using Mathematical Methods"

- Reviewer for several international journals including
  — **computational modeling journals** (PLoS Computational Biology, Medical Image Analysis, Scientific Reports, Journal of Theoretical Biology, Bulletin of Mathematical Biology, PLoS One, Mathematical Biosciences, Theoretical Biology and Medical Modeling, Mathematical Biosciences and Engineering, Journal of Biological Informatics, Journal of Biological Systems, ESAIM :Proc, Mathematics and Computers in Simulation)
  — **biological/medical journals about cancer and pharmacokinetics** (Nature Communications, Cancer Research, Clinical Pharmacology and Therapeutics, Clinical Pharmacokinetics, AAPS, British Journal of Cancer, BMC Cancer, Breast Cancer Research and Treatment)

PhD evaluations

Reviewer of 12 PhD thesis (F. Jeanneret, Université de Grenoble, 2024 ; V. Montalibet, Université de Bordeaux, 2024 ; B. Ocaña-Tienda, Universidad de Castilla-La Mancha, 2024 ; P. Chassonnery, Université de Toulouse, 2024 ; M. Péré, Unviversity Côte d'Azur, 2023 ; M. Strobl, Oxford University, 2021 ; L. Deyme, Aix-Marseille University, 2020 ; M. Zulian, Ecole Polytechnique, 2020 ; A. Alvarez-Arenas Alcami, Universidad de Castilla La Mancha, 2019 ; A.S. Giaccobi, Université de Picardie, 2019 ; J. Goya-Outi, Université Paris-Saclay, 2019 ; Emilia Kozlowska, University of Helsinki, 2019)

Jury member of 18 PhD thesis (F. Jeanneret, Université de Grenoble, 2024 ; V. Montalibet, Université de Bordeaux, 2024 ; B. Ocaña-Tienda, Universidad de Castilla-La Mancha, 2024 ; P. Chassonnery, Université de Toulouse, 2024 ; M. Péré, Unviversity Côte d'Azur, 2023 ; M. Strobl, Oxford University, 2021 ; C. Vaghi, Bordeaux University, 2020 ; B. Schneider, Iowa State University, 2020 ; L. Deyme, Aix-Marseille University, 2020 ; M. Zulian, Ecole Polytechnique, 2020 ; A. Alvarez-Arenas Alcami, Universidad de Castilla La Mancha, 2019 ; A.S. Giaccobi ; Université de Picardie, 2019 ; J. Goya-Outi, Université Paris-Saclay, 2019 ; Emilia Kozlowska, University of Helsinki, 2019 ; C. Nicolò, Université de Bordeaux, 2019 ; A. Rodallec, Aix-Marseille Université, 2018 ; K. El Alaoui, Université de Lorraine, 2017 ; E. Baratchart, Université de Bordeaux, 2016)

Jury member of 1 MD PhD thesis (C. Sentis, Aix-Marseille Université, 2019)

Scientific societies membership

American Association for Cancer Research (AACR), ID : 357915

Metastasis Research Society

International Society of Pharmacometrics (ISoP)

2020 - 2023   Grant bonus for doctoral management and research achievements (PEDR). 7 k€/year

2020 - 2022   Laureate of the Mathematics and Informatics for Cancer call of INCa (french National Cancer Institute). Project : QUANTIC - QUANTitative modeling combined to statistical learning to understand and predict resistance to Immune-checkpoint inhibition in non-small cell lung Cancer. 338 k€. Role : PI

2018 - 2020   Systems Biology Program of INCa (french National Cancer Institute). Title : Systems Biology of Renal Carcinoma using a mouse RCC model. 116 k€. Role : co-PI

2017   Inria associate team METAMATS : Modeling ExperimenTAl MetAsTaSis (co-PI : John Ebos). 13 k€/year for 3 years. Role : PI

2016 - 2019   Grant bonus for doctoral management and research achievements (PEDR). 5 k€/year

2016   CNRS "First support for an exploratory project" (PEPS). 4.3 k€. Role : PI

2014 - 2017   Amidex MARS (Modeling Anticancer Research & Simulation) project (PI : Pr Fabrice Barlesi. Multidisciplinary and therapeutic innovation Unit, AP-HM, Marseille). Role : Partner