Chloé Audebert

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Date of birth : June 25th, 1989 (28 years old)

Professional experience

2017– 2019 **Post-doctoral researcher**, *Inria Rhône-Alpes & ICJ Univ. Lyon 1*, France.

subject *Non-linear mixed effects models applied to CD8 T cells immune response modeling*

collaborations F. Crauste et O. Gandrillon (Inria team Dracula)

J. Marvel et C. Arpin (International Center for Infectiology Research)

ODE models, population parameters estimation, non-linear mixed effects models, CD8 T cells immune response

Feb.–Mar. 2017 **Scientific stay (one month) in bioMMeda team**, *Ghent University*, Belgium.

subject *Systemic and hepatic hemodynamics modeling during cirrhosis development*

collaborations P. Segers, C. Debbaut, G. Peeters (bioMMeda team, UGent)

W. Laleman (Department of Hepatology, University Hospitals Leuven, Belgium).

2013–2017 **PhD student in Applied Mathematics**, *Inria Paris & Sorbonne Universités, UPMC Paris 6*, France, defense February 24th, 2017.

title *Mathematical liver modeling: hemodynamics and function in hepatectomy*

supervisors J-F. Gerbeau and I. E. Vignon-Clementel

collaborations ANR project iFLOW, E. Vibert (INSERM U1193, Hôpital Paul Brousse), P. Bucur (CHRU de Tours), M. Bekheit (INSERM U1193, Hôpital Paul Brousse), Fluoptics company (Grenôble)

ODE and PDE models, Mathematical modeling, reduced order models, parameter estimation, numerical simulation, experimental measurements, database construction

Education

2012–2013 **MS in Mathematics for Life Sciences (2nd year)**, *Université Paris-Sud*, Orsay, France, With High Honors.
Scholarship from Fondation Mathématiques Jacques Hadamard

2011–2012 ***Agrégation* in Mathematics**, *Université Paris-Sud*, Orsay, France.
National highly competitive exam for teaching

2010–2011 **MS in Applied and Fundamental Mathematics (1st year)**, *Université Paris-Sud*, Orsay, France.

2007–2010 **BS in Mathematics**, *Université Paris-Sud*, Orsay, France.

Publications

First author papers

1. C. Audebert*, G. Peeters*, P. Segers, W. Laleman, D. Monbaliu, H. Korf, J. Trebicka, I. E. Vignon-Clementel et C. Debbaut. *Closed-loop lumped modeling of hemodynamics during cirrhogenesis in rats based on vascular casting*. Accepted in IEEE Transactions on Biomedical Engineering (* shared first co-authorship).
2. C. Audebert and I. E. Vignon-Clementel. *Model and methods to assess hepatic function from indocyanine green fluorescence dynamical measurements of liver tissue.* European Journal of Pharmaceutical Sciences (2018), 115, 304-319.
3. C. Audebert, M. Bekheit, P. Bucur, E. Vibert and I. E. Vignon-Clementel. *Partial hepatectomy hemodynamics changes : Experimental data explained by closed-loop lumped modeling.* Journal of Biomechanics (2017), 50, 202-208.
4. C. Audebert, P. Bucur, M. Bekheit, E. Vibert, I. E. Vignon-Clementel and J-F. Gerbeau. *Kinetic scheme for arterial and venous blood flow, and application to partial hepatectomy modeling.* Computer Methods in Applied Mechanics and Engineering (2017), 314, 102-125.

Coauthor papers in collaboration with surgeons

5. P. Bucur, M. Bekheit, **C. Audebert**, I. E. Vignon-Clementel and E. Vibert. *Simplified technique for 75% and 90% hepatic resection with hemodynamic monitoring in a large white swine model.* Journal of Surgical Research (2017), 209, 122-130.
6. P. Bucur, M. Bekheit, **C. Audebert**, A. Othman, S. Hammad, M. Sebagh, M-A. Allard, B. Decante, A. Friebel, D. Drasdo, E. Miquelestorena-Standley, J. G. Hengstler, I. E. Vignon-Clementel and E. Vibert. *Modulating portal hemodynamics with vascular ring allows efficient regeneration after partial hepatectomy in a pig model.* Annals of Surgery (2017).

Proceedings (The name of the person presenting is underlined)

P1. C. Audebert and I. E. Vignon-Clementel. *Mathematical modeling for liver functions estimation with indocyanine green measurements*, in "5th International Conference on Computational and Mathematical Biomedical Engineering - CMBE2017"

P2. I. E. Vignon-Clementel, C. Audebert et S. Pant. *Model parameter estimation with the UKF : a few examples from cardiovascular and compound dynamic signals*, in "5th International Conference on Computational and Mathematical Biomedical Engineering - CMBE2017"

P3. C. Audebert, P. Bucur, E. Vibert, J-F. Gerbeau et I. E. Vignon-Clementel. *Closed-loop cardiovascular system model and partial hepatectomy simulation*, in "4th International Conference on Computational and Mathematical Biomedical Engineering - CMBE2015"

Teaching

2017–2018 **Research project supervision, M1**, Université Lyon 1, Lyon, France.

Numerical linear algebra (36h), L3 - undergraduate, Université Lyon 1, Lyon, France.

2015–2016 **Sequences and series of functions, series, generalized integrals (20h), L2 – undergraduate**, Université Paris 6 UPMC, Paris, France.

2014–2015 **Calculus (72h), L1 - undergraduate**, *1^{st} semester*, Université Paris 6 UPMC, Paris, France.

Numerical resources, L1 - undergraduate for Small Private Online Classes (SPOC), Université Paris 6 UPMC, Paris, France.
exercises development on WIMS (WWW Interactive Multipurpose Server)

2013–2014 **Sequence and integrals, linear algebra (54h), L1 - undergraduate**, *2^{nd} semester*, Université Paris 6 UPMC, Paris, France.

Calculus (22h), L1 - undergraduate, *1^{st} semester*, Université Paris 6 UPMC, Paris, France.

Conferences

International conferences

September 2017 **Talk, International Conference on Computational Bioengineering (ICCB2017)**, Compiègne, France.
Mini-symposium "Tissue modeling to get insights in pharmacology, and vice-versa"

August 2017 **Talk, Colloquium 595 Biomechanics and computer assisted surgery meets medical reality**, Lille, France.

April 2017 **Talk, Computational and Mathematical Biomedical Engineering, CMBE**, Pittsburgh, USA.
Mini-symposium "Mathematical Modelling of Biological Fluid Flows & Transport: Applications to Translational Medicine"

July 2016 **Talk, Word Congress on Computation Mechanics, WCCM**, Seoul, Korea.
Mini-symposium "Direct and Inverse Methods for Cardiovascular and Pulmonary Biomechanics"

June 2016 **Talk, European Congress on Computational Methods in Applied Sciences and Engineering, ECCOMAS**, Crete Island, Greece.
Mini-symposium "Multiscale & Multilevel modeling in detoxifying organs and organs of the digestive tract"

June 2015 **Talk, Computational and Mathematical Biomedical Engineering, CMBE**, Cachan, France.
Mini-symposium "Reduced-order modelling of the cardiovascular system applied to practical problems in today's medicine and biology"

June 2014 **Talk, Word Congress on Computation Mechanics, WCCM**, Barcelona, Spain.
Mini-symposium "Multiscale liver simulation : a holistic model for hepatic function and perfusion"

May 2014 **Poster, 4^{th} International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease**, Inria Rocquencourt, Le Chesnay, France.

National congress and seminar

March 2018 **Seminar, Analyse appliquée A^3 LAMFA, Université de Picardie Jules Verne**, Amiens, France.

February 2018 **Seminar EDP, Modélisation et Calcul Scientifique, ICJ & UMPA**, Lyon, France.

January 2018 **Invited speaker, Groupe De Recherche (GDR) MECABIO**, *Mécanique des Matériaux et Fluides Biologiques*, Toulouse, France.

September 2017 **Invited speaker, Groupe De Recherche (GDR) MaMoVi**, *MAthématiques de la MOdélisation du VIvant*, Lyon, France.

June 2017 **Talk, Congrès SMAI 2017**, Ronce-les-bains, France.

March 2017 **Seminar, bioMMeda group**, Ghent University, Ghent, Belgium.

February 2017 **Seminar, Laboratoire de mathématique MAP5**, Université Paris Descartes, Paris, France.

November 2016 **Seminar, Journée interne du Laboratoire Jacques-Louis Lions, UPMC**, Paris, France.

November 2016 **Seminar, BioMécanique et BioIngénierie (BMBI), UTC**, Compiègne, France.

June 2016 **Open Brain in HPB Surgery, Club Innovation ACHBT**, Carnac, France.

May 2016 **Talk, Congrès National d'Analyse Numérique, CANUM**, Obernai, France.

December 2015 **PhD students seminar, Laboratoire de Mathématiques de Versailles**, Université Versailles St-Quentin, Versailles, France.

December 2015 **Seminar, Laboratoire de Mathématiques de Besançon**, Université de Franche-Comté, Besançon, France.

October 2015 **Junior Seminar, Inria Rocquencourt**, Le Chesnay, France.

February 2014 **PhD students seminar, Laboratoire de mathématique MAP5**, Université Paris Descartes, Paris, France.

Popularization

March 2018 **Participation to "MathaLyon"**, Lyon, France.

October 2015 **Presentation, "Raconte-moi ta thèse", Fête de la science**, Paris, France.

April 2015 **Poster, Journée"Correspondances"**, Paris, France.
Projet PEPS-égalité "Correspondances de Langlands"

Languages

French **Mother tongue**

English **Fluent** *(CLES 2, June 2011)*

Computer skills

C, C++, Python, MATLAB, Monolix

Other experiences

2007 – 2015 Junior handball coach (8 to 12 years old children), Palaiseau, France

2012 – 2013 Assistance to a blind professor for student's papers grading, Université Paris-Sud, Orsay, France

2010 – 2013 Volunteer in the association Satellite for homework help, Palaiseau, France