

# Viviana Clavería Ph.D.

[viviana.claveria@usach.cl](mailto:viviana.claveria@usach.cl) / +56 9225 79 616

## PROFILE

I am a result-orientated engineering physicist with mixed experience working within the industry, research and teaching for more than 9 years. My area of expertise is biofluids, bioengineering and microfluidics, specifically, the study of blood flow in both health, and diseases. As an engineer, I am working on translational technology building my own medical device. I feel passionate about teaching and scientific outreach activities for kids.

## CURRENT POSITIONS

- 11/2021 – to date **Postdoctoral Fellow** at the University of Chile, Millennium Nucleus Physics of Active Matter, Microfluidic manipulation of bacteria suspension's group, working with Dr. María Luisa Cordero.
- 10/2021 – to date **Co-chair** of the subcommittee model and thrombosis in the International Society of thrombosis and hemostasis, ISTH. This position lasts for 4 years.

## EDUCATION AND SCIENTIFIC EXPERIENCE

- 03/2020 – 10/2021 **Postdoctoral Fellow** at the Georgia Institute of Technology, School of Mechanical Engineering, Atlanta, USA working with Dr. David Ku on the development of a **point-of-care** device to assess thrombolytic state in patients and drug effect on arterial thrombosis treatment *in vitro*. In parallel, I worked as a part of the ACME-POCT Engineer Core team, supporting the development of accurate, innovative, fast, and easy-to-use devices for COVID-19 testing. These tests were part of the Rapid Acceleration of Diagnostics (RADx) program launched by the National Institute of Health (NIH), USA, in 2020.
- 07/2017 – 11/2019 **Postdoctoral Fellow** at the University of Montpellier working with Dr. Manouk Abkarian in the projects Globule and Rheoblood investigating the mechanical properties of red blood cells at rest, and the dynamics between red blood cells and nanoparticles in microflow by experiments *in vitro*. In Globule, I collaborated with the company HORIBA Medical, helping on measurements for **prototyping a medical device** to assess RBC elasticity. In Rheoblood, I mounted a 2 lasers Fluorescence Correlation Spectroscopy system (2-FCS) coupled to a rheometer to investigate and characterized blood rheology.
- 09/2013 – 06/2017 **Ph.D. in Physics** of the Franco-German University collaborative program between Saarland University, Germany and University of Montpellier, France. Thesis: “*Flow of healthy and sickle red blood cells in microcirculatory conditions: clustering process and self-margination phenomenon*”. Advisors: Prof. Dr. Christian Wagner (Germany) and Dr. Manouk Abkarian (France).
- 03/2005 – 12/2010 **Engineering Physics**, University of Santiago of Chile, Chile. Thesis: “*New lighting techniques for manipulation of microparticles using optical tweezers*”, Advisor: Dr. Albert Ferrando, University of Valence, Spain.

03/2005 – 12/2009 **Bachelor of Science on Applied Physics**, University of Santiago of Chile, Chile.  
Main courses (theory and laboratory): Thermodynamics, Electromagnetism, and Statistical Mechanics, Fluids Mechanics, Classical Mechanics, Quantum Mechanics and Optics.

#### SKILLS AND EXPERTISE

- Rich experience in **laboratory work** performing **experiments** with expertise in the use, design and manufacturing of **microfluidics** devices, the use of syringes, vacuum pumps, optical tweezers, fluorescence microscopy, confocal microscopy, polarization microscopy, rheometers, micropipettes and micromanipulators, AFM, fast cameras, handling healthy and diseased blood, and hazard chemicals.
- Vast experience **acquiring** and **analyzing big data**.
- Expertise on medical device prototyping, using 3D printing techniques, arduino, nano-arduino and other electrical/mechanical biocompatible and non-biocompatible components.
- Frequent user of Matlab, ImageJ, Origin, Fusion360, LaTeX and AutoCAD. I have some experience working with Comsol, and Solidworks.
- Highly skilled on **image analysis** techniques, including **AI**.
- Strong interpersonal relation skills.

#### LIST OF SCIENTIFIC PUBLICATIONS

##### Published

1. **V. Clavería**, L. Lanotte, C. Renoux, P. Joly, G. Cannas, A. Gauthier, C. Wagner, P. Connes, and M. Abkarian. Segregation of sickle red blood cells suspensions in glass capillaries, *Frontiers in Physiology*, (2021). DOI: 10.3389/fphy.2021.737739
2. **V. Clavería**, P. Yang, M. Griffin, D. Ku, Global Thrombosis Test: Occlusion by Coagulation or SIPA? *THOpen* (2021). DOI: 10.1160/THOpen
3. E. J. Nehl, S. S. Heilman, D. Ku, D. S. Gottfried, O. Brand, W. Lam, G. Martin, S. Farmer, R. Mannino, **V. Clavería**, E. Tyburski, J. Sullivan, A. Suessmith, et al. A blueprint for progress and change: the essential role of the RADx Tech Test Verification Core and the ACME POCT in the evaluation of COVID-19 testing devices. Accepted on the *IEEE Open Journal of Engineering in Medicine and Biology* (2021). DOI: 10.1109/OJEMB.2021.3070825
4. A. Mahkro, I. Hegemann, E. Seiler, G. Simionato, **V. Clavería**, N. Bogdanov, C. Saselli, P. Torgeson, L. Kaestner, M. Manz, J. Goede, M. Gassmann and A. Bogdanova. A pilot clinical phase II trial MemSID: Acute and durable changes of red blood cells of sickle cell disease patients on memantine treatment, *eJHaem*, (2020). DOI: 10.1002/jha2.11
5. M. Fenech, V. Giroda, **V. Clavería**, S. Meancea, M. Abkarian and B. Charlot, Blood vasculature replicas using backside lithography, *Lab on a chip*, (2019). DOI: 10.1039/C9LC00254E
6. **V. Clavería**, P. Connes, C. Wagner, Chapter 10 “Aggregation and blood flow in health and disease”. Book: *Suspension Dynamics of Blood Cells in Microflows*, CRC Press/Taylor & Francis Group (2018). DOI: 10.1201/b21806-6
7. **V. Clavería**, O. Aouane, M. Thiébaud, M. Abkarian, G. Coupier, C. Misbah, T. John, and C. Wagner, Clusters of Red Blood Cells in Microcapillary Flow: Hydrodynamic versus Macromolecule Induced interaction. *Soft Matter* (2016). DOI: 10.1039/C6SM01165A
8. L. Lanotte, J. Mauer, S. Mendez, D. A. Fedosov, J.-M. Fromental, **V. Clavería**, F. Nicoud, G. Gompper, and M. Abkarian. Red cells’ dynamic morphologies govern blood shear thinning under microcirculatory flow conditions. *Proceedings of the National Academy of Sciences*, (2016). DOI: 10.1073/pnas.1608074113

### **Submitted**

1. S. Farmer, V. Razin, A. Foster Peagler, S. Strickler, J. M LevyE, **V. Clavería**, et al. Don't Forget About the Human Factors: Lessons Learned from COVID-19 Point-of-Care Diagnostic Testing, Submitted to Nature Biomedical Engineering, Nov. 2021

### **In preparation**

1. **V. Clavería**, L. Lanotte, G. Simionato, P. Connes, S. Mendez and M. Abkarian, The "Truth" about the two scales heterogeneities in the stress-free shape of red blood cells membrane (2022)
2. R. Merinno, **V. Clavería**, T. Willoughby, O. Brand, D. Gottfried, D. Ku. Lessons learned in the creation of a Center for the Rapid Assessment of Diagnostic tests for COVID-19 (2022)

## **MEMBERSHIPS**

### Current

1. Optical Society of America, OSA
2. American Physical Society, APS
3. Sociedad Chilena de Física, SOCHIFI
4. International Society of Thrombosis and Hematology, ISTH
5. Frontiers in Physics, Editorial Panel, Soft Matter group
6. Deutsche Rheologische Gesellschaft, DRG

### Previous

7. Club du Globule Rouge et du Fer
8. Deutsche Physikalische Gesellschaft, DPG

## **PARTICIPATION IN CONFERENCES**

- 2021 ISTH Conference, USA (Poster)
- 2019 Fluids and Health conference, France (Flash Talk)  
iPOLS, Germany (Talk)  
54ème congrès annuel du Groupe Français de Rhéologie, GFR2019, France (Talk)
- 2018 Blood Flow: Current State and Future Prospects conference, France (Talk)  
7ème Journées scientifiques du LabEx NUMEV, France (Poster)
- 2017 6ème Journées scientifiques du LabEx NUMEV, France (Poster)  
Congrès Annuel Club du Globule Rouge et du Fer- Ile de Ré, France (Poster)  
Zsigmondy colloquium of the german colloid society, Germany (Poster)
- 2016 Cell physics conference, Germany (Poster)  
18th Conference of the European Society for Clinical Hemorheology and Microcirculation, Portugal (Talk)
- 2015 GDRI Physics of Living Systems and the GRISBI Network, France (Talk)  
10th Annual European Rheology Conference AERC 2015, France (Talk)
- 2014 GRK-Status seminar, Germany (Poster)  
Cell physics conference, Germany (Poster)  
3ème journée scientifique Labex NUMEV, France (Poster)

## **SCHOLARSHIPS AND GRANTS**

- 2022 Optical Society of America Traveling Lecturer Grant (India, invited).
- 2019 MIT travel grant, *Fluids and Health conference* (France).
- 2018 Optical Society of America Traveling Lecturer Grant (Chile).

- 2015 Equality measure scholarship “Gleichstellungsmaßnahmen” for woman in science by the SFB-1027 (Germany).
- 2011 Optical Society of America Scholarship, *Renewable Energy and the Environment Conference*, (USA).  
Optical Society of America Scholarship, *Advance Photonics and Renewable Energy OSA Optics & Photonics Congresses*, (Germany).

### LECTURING EXPERIENCE

- 2017 – 2018 **Co-supervising two master thesis**, University of Montpellier, France.
- 09/2014 – 02/2015 **F-praktikum laboratory assistance** at the Optical tweezer lab, Saarland University, Germany.
- 03/2012 – 12/2013 **Professor** at the Institute of banking studies, Guillermo Subercaseaux, Chile, of the following courses:  
Statistical applications to business  
Applied Mathematics  
Introduction to calculus  
Basics Elements of Mathematics
- 03/2006 – 12/2012 **Lecture Assistant**, University of Santiago of Chile, Chile, for the following lectures:  
Differential equations, Program: Civil Engineering (2012)  
Annual Algebra, Program: Civil Engineering (2012)  
Physics II, Program: Mathematics Engineering (2008)  
Annual Algebra, Program: Engineering physics (2006 - 2007)

### LEADERSHIP EXPERIENCE

- 05/2014 – 05/2016 **PhD representative** at the Faculty 7 of Mechatronics and Physics, University of Saarland, Germany.
- 2006 – 2013 **General Manager** of the 1st Optics and Photonics Chilean Congress, Chile (2013)  
**President** of the University of Santiago OSA Student Chapter, Chile (2011 – 2013)  
**Representative** of the University of Santiago OSA Student Chapter at the *OSA's 93rd Annual Meeting, Frontiers in Optics, FiO*, USA (2009)  
**President** of the Students of the Engineering Physics Program, Usach, Chile (2008)  
**Culture and Protocol coordinator** at the *IV National Symposium for Physics Students*, Chile (2006)

### EXTRA STUDIES

- 2018 Physics of integrated biological systems summer school, France
- 2016 Active Complex Matter summer school, France
- 2015 Living Fluids Workshop of the German-French Doctoral School DFDDK, Germany  
SFB 1027 Summer Camp for Junior Scientist, Germany
- 2014 SFB 1027 Summer Camp for Junior Scientists, Germany  
Living fluids summer school, Morocco  
Softmat control winter school, Saarland University, Germany
- 2011 Diploma in Renewable Energies at the University of Santiago of Chile, Chile (7 months program).  
Main courses: Solar, geothermic, biomass and wind energies, Hydrogen technologies, Energy efficiency, and Energy Market.

- 2010 Capillarity and Interfacial Hydrodynamics course, University of Santiago of Chile, Chile  
 Summer school on Synthetic Biology, Polytechnique University of Valencia, Spain
- 2008 First Magnetism School for university students, University of Santiago of Chile, Chile  
 International Mini-Workshop on Nonlinear physics, University of Santiago of Chile, Chile
- 2007 Theory of light and telescopes course, University of Santiago of Chile, Chile

### REFEREES FOR RECOMMENDATION

The following people can be contacted to recommend or to give a reference about myself and my work:

1. Dr. David Ku, [david.ku@me.gatech.edu](mailto:david.ku@me.gatech.edu)
2. Dr. Manouk Abkarian, [manouk.abkarian@umontpellier.fr](mailto:manouk.abkarian@umontpellier.fr)
3. Dr. Christian Wagner, [c.wagner@mx.uni-saarland.de](mailto:c.wagner@mx.uni-saarland.de)
4. Dra. Marianne Fenech, [marianne.fenech@uottawa.ca](mailto:marianne.fenech@uottawa.ca)

### PROFESSIONAL EXPERIENCE

- 11/2020 – to date **Member of the ACME-POCT Engineer Core team** at the Rapid Acceleration of Diagnostics (RADx) program promoted by the National Institutes of Health (NIH), USA.
- 11-12/2020 **Consulting Engineer**, Global Diagnostics Systems, USA
- 06/2012 – 07/2013 **System Analyst**, ACPNet E.I.R.L., Chile.
- 02/2011 – 10/2011 **Product Engineer**, Dantechique Ltda. Engineering, projects and industrial components, Chile.
- 04/2010 – 08/2010 **Internship**, Energesis Engineering S.L., Valencia, Spain.

### ADDITIONAL INFORMATION

- Languages**
- |         |                |
|---------|----------------|
| Spanish | Native speaker |
| English | Fluent         |
| French  | B2 level       |
| German  | A2 level       |
- Hobbies** Oil and watercolor painting, freehand drawing, author of “Puda, the little Pudúdeer” [www.pudastory.cl](http://www.pudastory.cl), children scientific book’s series, jogging
- Drive licenses** Drive license class B