XX Anniversary Circulating Tumor Cells

Scientific Program

ISLB
INTERNATIONAL SOCIETY OF LIQUID BIOPSY

24-25 May 2024

Centro Genyo

Avenida de la Ilustración, 114
18016, Granada(Spain)

Welcome

Dear Esteemed Colleagues,

We want to welcome all of you to the celebration of the 20th Anniversary of the publication of the first paper on Circulating Tumor Cells!

Two decades of relentless pursuit, groundbreaking discoveries, and unwavering commitment to unraveling the mysteries of circulating tumor cells have brought us to this remarkable milestone. As we gather here today, we reflect on the extraordinary journey that has shaped the landscape of cancer research and diagnostics.

Over the years, our collective efforts pushed the boundaries of scientific understanding, opening new avenues for early detection, disease monitoring, personalized medicine, and innovative targeted treatment strategies. The wealth of knowledge and collaboration within this field has not only deepened our comprehension of cancer biology but has also paved the way for transformative advancements in patient care.

As we commemorate this 20th anniversary, let us acknowledge the commitment of researchers, clinicians, and professionals who have dedicated their careers to the study of circulating tumor cells. Your commitment has not only fueled scientific progress but has provided hope to countless individuals affected by cancer.

Throughout this celebratory event, let us engage in vibrant discussions, share our latest findings, and foster new collaborations that will undoubtedly shape the future of circulating tumor cell and, more in general liquid biopsy research. Together, we stand at the forefront of innovation, poised to make even greater strides in our collective quest to understand and combat cancer.

Here's to two decades of progress, discovery, and resilience in the realm of Circulating Tumor Cells. May the next twenty years bring even more groundbreaking achievements, as we continue to work towards a world where cancer is not just treatable but preventable.

We invite and wait for you in Granada, and let the spirit of scientific inquiry, collaboration and friendship guide our path forward."

Cheers to the 20th Anniversary of Circulating Tumor Cells!

Sincerely

Dr Massimo Cristofanilli and Dr M Jose Serrano

Program

05/24/2024

9:00am **9:15am**	**Welcome and introduction Dr Massimo Cristofanilli and Dr M José Serrano**
9:15am **10:45am**	**Track 1: Circulating Tumor Cells as Prognostic Markers to guide therapy in Advanced and Metastatic Disease**
	Clinical applications of CTCs in early and advanced breast cancer: A 20 years journey JY Pierga. France **Clinical applications of CTCs in metastatic Colorectal Cancer** C Nicolazzo. Italy **Clinical applications of CTCs in advanced prostate cancer** J De Bono. UK **Discussion** M Cristofanilli. USA
10:45am **11:45am**	**Track 2: Circulating Tumor Cells in Non metastatic and locally advanced disease**
	Circulating Tumor Cells clinical validity M Cristofanilli. USA **Evaluation and applications of CTCs in Melanoma** A Lucci. USA **Clinical applications of CTCs in early prostate cancer** P.Giannakakou. USA **Discussion** E Jantus. Spain
11:45am **12:00am**	**Coffe break**

Program

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12:00pm **1:00pm**	**Track 3.1: Evaluation of CTC detection and utility in other solid tumors**
	CTCs in Lung Cancer: Evolving concepts and clinical applications D Rothwell. UK **CTCs detection and molecular analysis in ovarian cancer** S Kasimir-Bauer. Germany **Liquid biopsy in GI malignancies** PM Kasi. USA **Discussion** MJ Serrano. Spain
1:00pm **2:00pm**	**Track 3.2: Exploratory setting for CTC detection**
	CTCs in Liver Cancer M alunni-Fabbroni. Germany **CTCs in Bladder Cancer** P Gazzaniga. Italy **CTCs in Endometrial Cancer** L Muinelo-Romay. Spain **Discussion** S Maheswaran. USA
2:00pm **3:00pm**	**Lunch**

Program

05/24/2024

3:00pm **4:00pm**	**Track 4: Understanding CTC Heterogeneity**
	Models to study CTCs and CTC culture methods R Piñeiro. Spain **Advancing CTC-based Liquid Biopsy: Amplifying Yield and Leveraging Single-Cell Genomic Profiling to Provide Clinically Relevant Information** NH Stoecklein. Germany **CTCs, stemness and metastasis-initiating properties** G Bertolini. Italy **Discussion** MJ Serrano. Spain
4:00pm **5:15pm**	**Track 5: Molecular assessment in liquid biopsy**
	Isolation Strategies I Comino-Mendez. Spain **Phenotypic Characterization in liquid biopsy: focus on CTCs** C Reduzzi. USA **EV as predictive biomarkers in lung cancer** FG Ortega. Spain **ctDNA Characterization in breast cancer** L Gerratana. Italy **Discussion** V Denninghoff. Spain

Program

First Day

05/24/2024

5:15pm **6:15pm**	**Track 6: Future of Liquid Biopsy**
	MultiSolution liquid Biopsy algorithm and Blood Tumor Load F Coumans. The Netherlands **AI and Circulating Tumor Cells** M Hackenberg. Spain **Liquid biopsy as a screening test** DD De Carvalho. Canada **Discussion** PV Nuzzo. USA
6:15pm **6:35pm**	**Special Session** **Menarini**
	CellSearch Technology, Past, Present, and Future Michael Paris. USA. **CEO of Menarini Silicon Biosystems** Gianni Medoro. Italy. **Chief Technology Officer of Menarini Silicon Biosystems**
19:30pm	**Transfer from Hotel to Restaurant "Aixa"** **Faculty Dinner**
22:00pm	**Transfers from Restaurant "Aixa" to Alhambra and Hotel**

Program
Second Day
05/25/2024

10:00am **11:00am**	**Track 7: CTC in clinical practice**
	CTCs in early Breast Cancer: Evidence and future directions M Ignatiadis. Belgium **Circulating Tumor Cells as a decision tool to guide therapy** FC Bidard. France **Reimbursement and access in the field of personalized medicine: CTC in clinical practice** N Farkas. Switzerland **Discussion** V Denninghoff. Spain
11:00am **12:00pm**	**SPECIAL SESSION: CTCs Guidelines in Advanced and Early Disease**
	CTC integration in pathology lab F Pagni. Italy **T(umor), N(odes), M(etastasis), C(irculating): time to add a new letter for tumor staging?** D Sgroi. USA **Cellular Residual Disease (CRD) – Expanding the concept of minimal residual disease monitoring** E Nicolò. USA **How Parsortix can improve your Liquid Biopsy analysis** Anne-Sophie Pailhes-Jimenez. UK **Discussion** MJ Serrano. Spain M Cristofanilli. USA
12:00pm **12:30pm**	**Conclusions and Meeting adjourn**
	M Cristofanilli. USA - ISLB Past President MJ Serrano. Spain - ISLB Vicepresident

M Cristofanilli

Director of Breast Medical Oncology.
Associate Director of Precision Oncology at the Meyer Cancer Center (MCC).
Scientific Director of the Englander Institute of Precision Medicine (EIPM)
Medical Degree from the University "La Sapienza" in Rome.
Internal Medicine at The University of Texas MD Anderson Cancer Center
Founder and President of the IBC International Consortium (IBC-IC).

Massimo Cristofanilli, MD, is an accomplished board-certified medical oncologist with more than two decades of experience as physician, investigator, researcher and leader. He has demonstrated original and innovative vision in the field of molecular diagnostics, liquid biopsy, translational research and drug development. Additionally, Dr. Cristofanilli has an extensive background in clinical trial design and is a key thought leader in the field of metastatic and locally advanced breast cancer.At Weill Cornell Medicine and NewYork-Presbyterian, Dr. Cristofanilli serves as the Director of Breast Medical Oncology, the Associate Director of Precision Oncology at the Meyer Cancer Center (MCC), and the co-leader of the MCC Breast Cancer Disease Management Team, as well as the Scientific Director of the Englander Institute of Precision Medicine (EIPM).Dr. Cristofanilli received his medical degree from the University "La Sapienza" in Rome with Honors where he subsequently completed his fellowship in medical oncology. He completed an Internal Medicine residency at Cabrini Medical Center in New York and a medical oncology fellowship at The University of Texas MD Anderson Cancer Center, where he also served as Faculty in the Department of Breast Medical Oncology for more than a decade.Dr. Cristofanilli has held several leadership positions over the years, including Chair of Medical Oncology and Associate Director of Clinical Research at the Fox Chase Cancer Center and Associate Director of Translational Research at Thomas Jefferson University. From 2015-2021, Dr. Cristofanilli was Professor of Medicine at the Robert H. Lurie Comprehensive Cancer Center at Northwestern University in Chicago where he also served as the Director of the Breast Disease Team, Director of the Robert Lurie Cancer Center OncoSET Precision Medicine Program, and Associate Director of Clinical Research.In addition to his clinical expertise, Dr. Cristofanilli's research focuses on biomarkers of endocrine resistance in breast cancer, liquid biopsies and novel drug development. His research in the areas of novel drug development, circulating tumor cells (CTCs) and ctDNA have led to improved treatments for breast cancer. Dr. Cristofanilli is an internationally recognized expert in the research and treatment of Inflammatory Breast Cancer (IBC), the most aggressive and deadly form of breast cancer. He is the founder and President of the IBC International Consortium (IBC-IC). Additionally, Dr. Cristofanilli is globally recognized for his contributions on the detection of micrometastatic disease in breast cancer and a key opinion leader in drug development in hormone-receptor positive metastatic breast cancer. He has co-authored more than 400 peer-reviewed manuscripts.

MJ Serrano

Principal Investigator of the Liquid Biopsy and Cancer Interception group (LiqBiopCI) at the University Hospital Virgen de las Nieves and GENyO center in Granada, and Associate Professor at the Pathological Anatomy Department of the University of Granada. Her career is rooted in oncological research, primarily focusing on the field of liquid biopsy. Dr Serrano is a co-founder and currently serves as Vice President of the International Society of Liquid Biopsy (ISLB). She is a pioneer in the study of Circulating Tumor Cells, and she is renowned for her contributions as one of the principal experts in Liquid Biopsies.

Principal Investigator of the Liquid Biopsy and Cancer Interception group (LiqBiopCI) at the University Hospital Virgen de las Nieves and GENyO center in Granada, and Associate Professor at the Pathological Anatomy Department of the University of Granada. Her career is rooted in oncological research, primarily focusing on the field of liquid biopsy. Throughout her career, she has undertaken various research stays in Spain (Bilbao, Pamplona, Barcelona) and abroad (Tromso, Norway). She has authored over 100 articles in the dynamic field of Liquid Biopsy. Her projects are concentrated on the investigation of circulating tumor cells, platelets, and cell-free tumor DNA in various solid tumors. Presently, she leads a national project funded by the European Commission aimed at the clinical implementation of Liquid Biopsy in Andalusian Hospitals (Innovative Public Procurement). The outcomes of these projects have led to internationally licensed patents, the latest of which focuses on a novel methodology for detecting circulating pulmonary cells in COPD patients. The work conducted by her group has been acknowledged by the Health Ministry and the Andalusian Health Service (SAS). Dr Serrano is the coordinator of the Innovative Public Procurement in health in Andalucia. Additionally, she is a co-founder and currently serves as Vice President of the International Society of Liquid Biopsy (ISLB). Dr. Serrano is a pioneer in the study of Circulating Tumor Cells, and she is renowned for her contributions as one of the principal experts in Liquid Biopsies.

J Pierga

Professor of Medicine and Medical Oncology at Université Paris Cité.
Leaded the Medical Oncology Department of the Institut Curie, Paris Cancer Center.
Member of the Circulating Tumor Biomarkers at the Institut Curie.

Prof. Jean-Yves Pierga has been Professor of Medicine and Medical Oncology at Université Paris Cité since 2005. He has headed the Medical Oncology Department of the Institut Curie, Paris Cancer Center since 2014. His main research interests are breast cancer treatments, early clinical trials and translational research. He is currently a Member of the Circulating Tumor Biomarkers at the Institut Curie. He has contributed to over 350 peer-reviewed publications. He is member of Société Française de Cancérologie (SFC), European Society for Medical Oncology (ESMO), American Society of Clinical Oncology (ASCO), Breast Cancer Group of the EORTC, American Association for Cancer Research (AACR).

C Nicolazzo

Researcher at the Cancer Liquid Biopsy Unit of the Department of Molecular Medicine, Sapienza University of Rome.
PhD in Molecular Medicine, and the specialization in Clinical Pathology and Clinical Biochemistry, at Sapienza University.

Chiara Nicolazzo is a Researcher at the Cancer Liquid Biopsy Unit of the Department of Molecular Medicine, Sapienza University of Rome. She received the master's degree in Pharmaceutical Chemistry and Technologies, the PhD in Molecular Medicine, and the specialization in Clinical Pathology and Clinical Biochemistry, at Sapienza University. Since 2008 she has been focusing her work on the cancer research by studying tumor-derived biomarkers circulating in the bloodstream and other body fluids. In particular, her research activity involves the isolation and characterization of circulating tumor cells (CTC) as well as the circulating tumor DNA (ctDNA) analysis, with a specific focus on colorectal cancer. She is strongly committed to technical challenges associated with liquid biopsy and biomarker development, and to the optimization of methods for CTC and ctDNA analysis from a single blood sample.

J De Bono

Regius Professor of Cancer Research at The Institute of Cancer Research.
Honorary Consultant in medical oncology at The Royal Marsden Hospital.

Professor Johann de Bono is Regius Professor of Cancer Research at The Institute of Cancer Research and honorary consultant in medical oncology at The Royal Marsden Hospital. He led on the development of abiraterone, cabazitaxel, enzalutamide, olaparib, lutetium PSMA and the molecular genomic stratification and germline sequencing of advanced prostate cancer. Professor de Bono leads the Drug Development Unit at the Royal Marsden which comprises >100 staff and conducts >50 Phase I clinical trials at any one time and runs a research laboratory. He has been involved in developing more than 200 new agents and is currently evaluating many new drugs in early clinical trials. He has published >600 papers and has
mentored many PhD students.

A Lucci

Professor of Surgery with dual appointments in the Departments of Breast Surgical Oncology and Surgical Oncology at The University of Texas MD Anderson Cancer Center.
eputy Director of the MD Anderson Inflammatory Breast Clinic and Research Program.

Dr. Lucci is the Marvin M. Romsdahl MD PhD endowed Professor of Surgery with dual appointments in the Departments of Breast Surgical Oncology and Surgical Oncology at The University of Texas MD Anderson Cancer Center. Dr. Lucci is the Deputy Director of the MD Anderson Inflammatory Breast Clinic and Research Program, a multidisciplinary clinic that sees over 150 inflammatory breast cancer patients each year.
Dr. Lucci's clinical focus is on treating patients with breast cancer and melanoma, but he also maintains a laboratory and clinical research team looking at circulating tumor cells and circulating tumor DNA in the blood of cancer patients. He has published 250 peer-reviewed research articles, including a first report in Lancet Oncology of the significance of circulating tumor cells (CTCs) in non-metastatic breast cancer patients. He has contributed to and co-authored several pooled analyses in JNCI and Clinical Cancer Research demonstrating the significance of CTCs in early breast cancer. Dr. Lucci has also published multiple papers on the significance of CTCs in patients with melanoma, including a report in Clinical Cancer Research demonstrating association of CTCs with early relapse in patients with Stage III melanoma. Dr. Lucci will discuss evaluation and application of CTCs in patients with melanoma at his presentation at the ISLB / 20th Anniversary of Circulating Tumor Cells Meeting.

P Giannakakou

Professor of Pharmacology in Medicine at WCMC.
Director of Laboratory Research in the Division of Hematology and Medical Oncology.

Professor of Pharmacology in Medicine, in the Department of Medicine, Division of Hematology and Medical Oncology at WCMC. She is also the Director of Laboratory Research in the Division of Hematology and Medical Oncology and is member of the faculty of WCMC, Weill Cornell Graduate School of Medical Science (WCGSMS) and the Meyer Cancer Center.

Dr. P. Giannakakou is an accomplished investigator with more than 86 publications in high profile journals. Her laboratory studies the biology of the microtubule cytoskeleton and the molecular mechanisms of action and resistance to drugs that target microtubules (e.g. taxanes) and are used in cancer chemotherapy. Her research is focused on the identification of microtubule-dependent cell signaling and trafficking pathways that are critically involved in cancer progression. To translate her group's preclinical work to the clinical setting they have developed a number of multidisciplinary approaches that allow the isolation and molecular characterization of patient-derived circulating tumor cells (CTCs), which they use as a source of liquid biopsy to study the molecular basis and evolution of clinical drug resistance. These capabilities have allowed them to obtain funding for multi-institutional clinical trials, which use CTCs to follow patients longitudinally and to establish biomarkers predictive of response to therapy. Dr. Giannakakou's ultimate goal is to identify new molecular targets that affect or are affected by microtubule dynamics use this knowledge to develop better-targeted therapies for the treatment of cancer

E Jantus

PhD from the University of Valencia.
Associate professor of Cellular Biology in the Department of Biotechnology at the Polytechnic University of Valencia (UPV).
Director of the Master's program in Biomedical Biotechnology.

Eloisa Jantus is a biochemist and holds a PhD from the University of Valencia. She currently holds a position as associate professor of Cellular Biology in the Department of Biotechnology at the Polytechnic University of Valencia (UPV), where she also serves as the Director of the Master's program in Biomedical Biotechnology. She is part of the Executive Committee of the International Society of Liquid Biopsy and is an active member of CIBERONC (the Spanish cancer research network). Her research focuses on the development of 3D models in cancer and the search for new biomarkers in liquid biopsies. With over 100 published articles in the fields of Oncology, Biomarkers, and Liquid Biopsy, she spearheads competitive national and international projects focused on Liquid Biopsy. Dr. Jantus has been a guest speaker at international conferences (IASLC, ISLB) and actively participates in evaluation committees for projects on both national and international scales. Furthermore, she contributes her expertise to the editorial boards of specialized scientific journals in the field of molecular oncology and liquid biopsy

G Rothwell

Deputy Director, National Biomarker Centre, University of Manchester, UK.

After obtaining a BSc(Hon) in Applied Genetics from the University of Liverpool I studied for my DPhil with Professor Ian Hickson at the Weatherall Institute, University of Oxford investigating the functional role of DNA repair genes. After this I moved into translational research, initially looking for molecular markers in multiple myeloma then immunotherapy trials. In 2011 I joined the Nucleic Acid Biomarker (NAB) team of Professor
Caroline Dive at the CRUK Manchester Institute and began my current research focus on the molecular analysis of liquid biomarkers for use in cancer. This work focusses on utilising
circulating free DNA and circulating tumour cells to enable the molecular characterisation of tumours at the genetic, epigenetic and transcriptional level from a patient blood sample. I took over as Team Leader of NAB in November 2019 and became Deputy Director of the National Biomarker Centre in November 2022.

S Kasimir-Bauer

Apl Professor for Experimental Oncology, Head of Laboratory at the Department of Gynecology and Obstetrics at the University Hospital of Essen in Germany.

Dr. Sabine Kasimir-Bauer received her PhD in 1993 from the Institute of Med. Microbiology and Immunology at the University of Bochum in Germany. During her postdoctoral education in the Leukemia Research Group of Prof. Dr. M.E. Scheulen at the Department of Internal Medicine (Cancer Res) at the University Hospital of Essen in Germany, she studied mechanisms of therapy resistance in patients suffering from acute myeloid leukemia. In 1998, she became Head of the Laboratory for the "Detection and Characterization of Disseminated and Circulating Tumor Cells" at the same Department. Based on her immunocytochemical studies on disseminated tumor cells (DTCs) in the bone marrow (BM) and circulating tumor cells (CTCs) in blood of patients with epithelial cancers, she became Ass Professor in 2003. She continued working in the field as Head of the Laboratory at the Department of Gynecology & Obstetrics in the same University Hospital. Her main focus is the molecular characterization of CTCs in gynaecological cancers, the predictive value of CTCs for monitoring breast/ovarian cancer related therapies, the prognostic value of CTCs, their comparison with DTCs as well as stem cell properties of these cells. Based on these studies, she became apl Professor in 2009. Ongoing studies include expression profiling of CTCs including single cell analysis, compared with the expression on the primary tumor as well as the metastases to evaluate patients for targeted therapies. Besides CTC analysis in blood, the group now also focusses on circulating extracellular vesicles, circulating, cell-free DNA, microRNAs and some immuo-oncological aspects.

PM Kasi

MD is a Medical Oncology Specialist in New York, NY.

Dr. Pashtoon Kasi, MD is a Medical Oncology Specialist in New York, NY. They currently practice at Gastrointestinal (GI) Oncology and are affiliated with Weill Cornell Medical Center. Dr. Kasi has experience treating conditions like Liver Cancer, Cholangiocarcinoma and Upper Digestive Tract Cancer among other conditions at varying frequencies. At present, Dr. Kasi received an average rating of 5.0/5 from patients and has been reviewed 72 times. Their office accepts new patients and telehealth appointments. Dr. Kasi also speaks Pashto and Urdu. Dr. Kasi is board certified in Hematology and accepts multiple insurance plans.

M Alunni Fabroni

PhD in Biochemistry from the University of Trieste (Italy) .
Postdoctoral at the German Cancer Research Center.
Head of the Experimental Radiology Laboratory at the Department of Radiology.

Dr. Marianna Alunni-Fabbroni received her PhD in Biochemistry from the University of Trieste (Italy) in 1997. After her postdoctoral research at the German Cancer Research Center (Heidelberg, Germany) and the University of Rochester Cancer Center (Rochester NY, USA), she joined Beckman Coulter Life Science (Munich, Germany) as Head of the R&D Department, conducting the development of novel platforms for PCR-based single cell analysis. In 2013 she moved to the Munich University Hospital at the Ludwig-Maximilians-University, where she dedicated herself to liquid biopsy in breast and liver cancer. She presently works as Head of the Experimental Radiology Laboratory at the Department of Radiology. Her principal area of interest is the characterization of prognostic blood biomarkers, including circulating tumor cells and circulating nucleic acids, for liver malignancies treated with loco-regional therapies.

P Gazzaniga

MD, full Professor in Precision oncology.
PhD training at Deutsches Krebsforschungszentrum.
Leader of several studies aimed to define the clinical utility of liquid biopsies.

Paola Gazzaniga is a MD, full Professor in Precision oncology with a strong commitment to academic duties. Prof. Gazzaniga started her career in oncological research applying at the study of viral cancers. During her PhD training, she attended the laboratory of viral oncology at Deutsches Krebsforschungszentrum, under the supervision of Prof. Harald zur Hausen. Back to Italy she started working on cancer biomarkers in blood samples. Before the era of liquid biopsy, she demonstrated the impact of circulating biomarkers in patients with bladder tumors. When the promise of liquid biopsy became a more solid clinical perspective, she equipped her laboratory with different instruments for circulating tumor cells and ctDNA isolation and became leader of several studies aimed to define the clinical utility of liquid biopsies. She leads a small but highly motivated group dedicated to the translation of major achievements in the field of liquid biopsy into concrete tools for cancer patients management. Since 15 years her publication are all focused on the genomic and
molecular characterization of CTCs and ctDNA for therapeutic purpose, with special focus on colorectal and urothelial cancers.. She is involved in the study of the mechanisms underlying the clonal evolution of solid tumors through liquid biopsies, with the following aims: 1) identification of predictive biomarkers of response to targeted therapies and immunotherapies 2) early identification of the onset of drug resistance 3) identification of new therapeutic targets. Through national and international collaborations, she is involved in several pilot and phase 2 studies aimed to definitely integrate liquid biopsies into clinical practice. Her work in this field is attested by the collaborative works and publications with national and international groups involved in liquid biopsy- guided trials, published in high impact journals.

L Muinelo

Head of the Liquid Biopsy Analysis Unit at Health Research Institute of Santiago de Compostela (IDIS).

Head of the Liquid Biopsy Analysis Unit at Health Research Institute of Santiago de Compostela (IDIS). This unit is specialized in the study of circulating biomarkers (CTCs, ctDNA, cEVs) as a tool to characterize tumors and carry out a more personalized oncology in different tumour types. She has participated and coordinated numerous projects focused on the development of minimally invasive strategies to improve the clinical management of patients with cancer. She is author of >100 articles with high impact in the oncology field.

S Maheswaran

Ph.D. at Boston University.
Full professor at the Harvard Medical School.
Scientific Director for the Center for Circulating Tumor Cell (CTC). Innovation at the MGH Cancer Center.

Dr. Shyamala Maheswaran received her Ph.D. at Boston University, followed by postdoctoral research at MGH (Massachusetts General Hospital) and is currently a full professor at the Harvard Medical School. She serves as the Scientific Director for the Center for Circulating Tumor Cell (CTC) Innovation at the MGH Cancer Center. She is also one of the co-founders of TellBio Inc. a startup biotech company developing CTC-based diagnostics and therapeutics. Dr. Maheswaran is a world-renowned expert in defining how cellular plasticity contributes to cancer heterogeneity, metastasis, and therapeutic responses. She has published several high-profile papers on these topics and has received multiple awards for her work including the MGH Clinical Research Team Award (2008), AACR Team Science Award (2010), MGH Martin Prize for Basic Research (2015), Douglass Family Foundation Prize for Excellence in Oncology Research (2016) and the Outstanding Scientist Award from the American Association of Indian Scientists in Cancer Research (AAISCR) (2018).

Dr. Lucci's clinical focus is on treating patients with breast cancer and melanoma, but he also maintains a laboratory and clinical research team looking at circulating tumor cells and circulating tumor DNA in the blood of cancer patients. He has published 250 peer-reviewed research articles, including a first report in Lancet Oncology of the significance of circulating tumor cells (CTCs) in non-metastatic breast cancer patients. He has contributed to and co-authored several pooled analyses in JNCI and Clinical Cancer Research demonstrating the significance of CTCs in early breast cancer. Dr. Lucci has also published multiple papers on the significance of CTCs in patients with melanoma, including a report in Clinical Cancer Research demonstrating association of CTCs with early relapse in patients with Stage III melanoma. Dr. Lucci will discuss evaluation and application of CTCs in patients with melanoma at his presentation at the ISLB / 20th Anniversary of Circulating Tumor Cells Meeting.

R Piñeiro

Dr. Piñeiro leads the Cancer Modelling Laboratory, Translational Medical Oncology Group,at the Health Research Institute of Santiago de Compostela (IDIS).

His current research focuses on understanding the biology and contribution of circulating tumour cells (CTCs) and CTC clusters to metastasis, identifying new biomarkers with clinical application in monitoring and treatment development. Roberto's work has highlighted the clinical value of enumerating the presence of CTC clusters in metastatic breast cancer.

Roberto Piñeiro leads the Cancer Modelling Laboratory, Translational Medical Oncology Group, at the Health Research Institute of Santiago de Compostela (IDIS). He holds a PhD from the University of Santiago de Compostela (USC) and postdoctoral experience at Queen Mary University of London and University College London (UK), where he studied signalling pathways involved in oncogenesis, cancer cell proliferation and interactions with the tumour microenvironment.

His current research focuses on understanding the biology and contribution of circulating tumour cells (CTCs) and CTC clusters to metastasis, identifying new biomarkers with clinical application in monitoring and treatment development, and identifying ways to address tumour dissemination. Roberto´s work has highlighted the clinical value of enumerating the presence of CTC clusters in metastatic breast cancer, and has shown that CTC clusters, even of small size, have an intrinsic advantage over individual CTCs, enhanced by interactions with stromal cancer-associated fibroblasts.

N Stoecklein

Professor for Experimental Surgical Oncology at the Heinrich-Heine University Düsseldorf (HHU), Germany.

Nikolas Stoecklein Professor for Experimental Surgical Oncology at the Heinrich-Heine University Düsseldorf (HHU), Germany. His major research interests are minimal residual cancer and early systemic disease in gastro-intestinal cancers. Currently, his work focuses on CTCs and to establish workflows to analyze these rare cells comprehensively at single cell level. Prior to joining the HHU, Nikolas Stoecklein obtained post-doctoral training at the Institute of Immunology of the Ludwig-Maximilians-University Munich, Germany, in the group of Christoph Klein. He studied medicine at the University of Hamburg, Germany and the University of California Davies, Sacramento, USA (10/1991-5/1998).

G Bertolini

Master's Degree in Medical Biotechnology in 2005 from the Università degli Studi di Milano.
PhD, (Bertolini et al PNAS 2009).
Leading clinical studies at INT.

Dr Giulia Bertolini, received her Master's Degree in Medical Biotechnology in 2005 from the Università degli Studi di Milano. She joined the Unit of Epigenomics and Biomarkers of Solid Tumors at the Istitito Nazionale dei Tumori (INT), Milan and in 2011 she completed her PhD, with a project aimed at the identification of chemoresistant cancer stem cells (CSC) population in human lung cancer (Bertolini et al PNAS 2009).
She has gained a great expertise in the study of CSC and especially in the evaluation of their resistance to therapies (Fortunato et al Front. Immunol 2020), their involvement in metastasis formation (Bertolini et al Cancer Res 2015) and in the assessment of novel therapeutic strategies for their targeting (Bertolini et al Molecular Therapy 2021). She has a long-lasting experience in immunophenotypic, genomic and transcriptomic analyses of rare CSC populations using both preclinical models (PDX) (Moro et al J Thorac Oncol. 2015) and clinical samples (Rothwell et al BMC Genomics 2014).
In 2014 she spent a period as visiting fellow at the Prof. Caroline Dive's lab (Cancer Research UK Manchester), where she got trained in the study of Circulating Tumor Cells (CTCs) using cutting-edge technologies that allow their characterization at the single cell level (Morrow et al Ann Oncol 2016; Vismara et al Clin Chem 2022). She is currently leading clinical studies at INT aimed at evaluating at the single cell level the modulation of the CSC subset in the blood of patients with NSCLC and other solid tumors as a new biomarker to improve therapeutic outcome.

I Comino

Principal investigator of the Experimental Liquid Biopsy laboratory at the Institute of Biomedical Research of Málaga.

Dr. Comino-Mendez underwent specialized training at the Institute of Cancer Research (ICR) in London, focusing on utilizing liquid biopsy to advance the clinical management and prognosis of cancer patients. His specific contributions include the development of novel approaches for detecting minimal residual disease in individuals with localized breast cancer. Presently, he serves as the principal investigator of the Experimental Liquid Biopsy laboratory at the Institute of Biomedical Research of Málaga (IBIMA). Dr. Comino-Mendez is actively engaged in pioneering methodologies to achieve ultrasensitive detection of circulating tumour DNA (ctDNA) and circulating tumour cells (CTCs) both before and during treatment, in addition to their application as a screening tool for early cancer detection.

C Reduzzi

Director of laboratory in the Division of Hematology and Oncology at Weill Cornell Medicine (New York, USA).
PhD in Milan.

Carolina Reduzzi is a Research Associate and the Director of the Cristofanilli laboratory in the Division of Hematology and Oncology at Weill Cornell Medicine (New York, USA). She started working on liquid biopsy in breast cancer during her master's degree thesis, which she conducted at the Istituto Nazionale dei Tumori of Milan (Italy). Since then, she has focused her research on the analysis of circulating tumor cells (CTCs) at the single-cell level in different tumor types, including biliary tract, renal cell, urothelial and lung cancers, to improve the detection of CTCs with non-conventional phenotypes. After completing her PhD in Milan, she moved to the Northwestern University of Chicago (USA) to start her post-doctoral training under the guidance of Prof. Massimo Cristofanilli and in 2022 she moved to Weill Cornell Medicine. In the last years, her studies have focused on the analysis of CTC-clusters and on the use of different technologies to increase the detection of CTCs in patients with early breast cancer.

FG Ortega

Is a biochemist from the University of San Luis.
PhD in Biomedicine from the University of Granada.
Permanent researcher under the Nicolas Monardes Program of the Andalusian Health System.

Dr. Francisco Gabriel Ortega is a biochemist from the University of San Luis. In 2015, he received his PhD in Biomedicine from the University of Granada with the Liquid Biopsy and Cancer Interception group at GENYO (Granada). Following his PhD, leveraging his expertise in liquid biopsy, he joined the Weizmann Institute of Science (Israel) to lead proteomics research on Extracellular Vesicles (EVs) in breast cancer patient samples. This project was supported by the Israel Science Foundation (ISF), and Dr. Ortega was awarded a Ramon Areces Foundation postdoctoral fellowship during this period.

Subsequently, he undertook a second postdoctoral position in the nanomedicine group at the University Medical Centre (UMC) of Utrecht (Netherlands). After accumulating three years of international experience, he was awarded a FOLIUM postdoctoral fellowship from the Balearic Islands Government aimed at talent attraction. During this time, he secured funding as Principal Investigator (PI) from the Health Institute Carlos III (ISCIII) (project reference: PI19/01578) for his work on EVs and Lung Fibrosis.

Currently, within the LB&CI group, Dr. Ortega has obtained a Miguel Servet Contract from the Health Institute Carlos III (ISCIII) and will serve as a permanent researcher under the Nicolas Monardes Program of the Andalusian Health System. His research focuses on developing analytical approaches to investigate EV-associated biomarkers in Lung Diseases, including Cancer, Lung Fibrosis, and COPD. Over the past few years, he has received significant support from organizations such as EMBO, ISCIII, the Andalusian government, and the University of Granada.Presently, Dr. Ortega is establishing collaborations with various national and international groups to identify and validate EV-associated biomarkers in cancer and lung diseases.

L Gerratana

Associate Professor of Medicine and a Physician Scientist at the IRCCS CRO Aviano National Cancer Institute and at the Department of Medicine of the University of Udine.
Scientific Lead of the Breast Medical Oncology group and as member of the Precision Medicine Multidisciplinary Team at the IRCCS CRO Aviano National Cancer Institute.

Lorenzo Gerratana is an Associate Professor of Medicine and a Physician Scientist at the IRCCS CRO Aviano National Cancer Institute and at the Department of Medicine of the University of Udine. After graduating as MD, he focused on DNA repair in vitro models in Triple Negative Breast Cancer, clinical methodology and endpoint analysis.

This mixed background resulted in a pragmatic imprinting that still guides his current translational research towards clinical utility and transferability, with the ultimate goal of developing strategies with a significant impact on patients' care and quality of life.

As a medical oncology fellow at the University of Udine and visiting scholar at the Northwestern University of Chicago he focused his research on liquid biopsy and big data, with the aim of transferring promising tissue and liquid biopsy-based biomarkers and treatment strategies from the bench to the bedside by implementing them in a clinical utility-oriented framework.

He currently serves as Scientific Lead of the Breast Medical Oncology group and as member of the Precision Medicine Multidisciplinary Team at the IRCCS CRO Aviano National Cancer Institute.molecular characterization of CTCs and ctDNA for therapeutic purpose, with special focus on colorectal and urothelial cancers.. She is involved in the study of the mechanisms underlying the clonal evolution of solid tumors through liquid biopsies, with the following aims: 1) identification of predictive biomarkers of response to targeted therapies and immunotherapies 2) early identification of the onset of drug resistance 3) identification of new therapeutic targets. Through national and international collaborations, she is involved in several pilot and phase 2 studies aimed to definitely integrate liquid biopsies into clinical practice. Her work in this field is attested by the collaborative works and publications with national and international groups involved in liquid biopsy- guided trials, published in high impact journals.

V Denninghoff

Collaborates in Liquid Biopsy.
at Mount Sinai in New York, Serrano at GENYO in Granada, and Padillo-Ruiz at the Virgen del Rocío Hospital in Sevilla.
Director of the Molecular Clinical Laboratory of the University of Buenos Aires (UBA) - National Council for Scientific and Technical Research (CONICET) - Ministry of Health, Buenos Aires, Argentina.

Dr. Valeria Denninghoff founded in 1999 the first laboratory of Molecular Pathology in Argentina and co-founded in 2008 the Tumor Bank, approved by the Argentinian Ministry of Science-Technology-Productive-Innovation. She remained Head of the Section for more than 20 years at the Center for Medical Education and Clinical Research, where she developed the laboratories of Molecular Pathology, Molecular Oncology, Molecular Onco-Hematology, and Molecular Gynecology-Oncology., and directed the Sequencing Facility, both Sanger and NGS.

Dr. Denninghoff obtained a 2006 Ph.D. degree from Buenos Aires University. She is a Specialist in Clinical Precision Medicine in melanoma, colon, lung, and pancreatic cancer, from a deep approach in NGS techniques for ctDNA and CTC fenotification/genotification. She has completed his training with Drs. Wistuba at MD Anderson in Texas, Soraes at AC Camargo Hospital in Sao Paulo, and Liderau at the Rene Huguenin Center in Paris. She currently collaborates in Liquid Biopsy with Drs. Rolfo at Mount Sinai in New York, Serrano at GENYO in Granada, and Padillo-Ruiz at the Virgen del Rocío Hospital in Sevilla.

She is the Director of the Molecular Clinical Laboratory of the University of Buenos Aires (UBA) - National Council for Scientific and Technical Research (CONICET) - Ministry of Health, Buenos Aires, Argentina.

Dr. Denninghoff is a Member 2009 of the Scientific and Technological Researcher Career of CONICET in Argentina and a Member 2021 of the Liquid Biopsy and Cancer Interception Group in the Centre for Genomics and Oncological Research - Pfizer - University of Granada - Andalusian Regional Government (GENyO), Granada (Andalucía), Spain.

Between 2021 and 2023, she coordinated the project "Diagnosis and Precision Treatment in Infectious Diseases and Cancer – Liquid Biopsy –" (https://www.liquidbiopsyproject.com/es). The Project has been co-financed with 80% by the European Regional Development Fund through a grant granted by the Spanish Ministry of Science and Innovation with a total budget of 6,040,784.00 euros.

Dr. Denninghoff is on the Membership Committee of the International Society of Liquid Biopsy (ISLB), is on the Molecular Working Group of the Pathology Committee of the International Association for the Study of Lung Cancer (IASLC), is a Founding Member of the Ibero-American Association of Molecular Pathology, part of the Association for Molecular Pathology (AMP) and is on the Editorial Board of the Journal of Liquid Biopsy.

She also serves as Academic Editor, Academic Reviewer, and National and International Grant Reviewer, such as Oncomine Clinical Research Grant-Thermo Fisher Scientific, International Cancer Technology Transfer Fellowship-International Union against Cancer (UICC), and Yamagiwa-Yoshida Memorial International Cancer Study Grant-UICC.

F Coumans

Frank Coumans was the first to show the prognostic significance of tumor-derived extracellular vesicles in samples of prostate cancer patients. He has developed and standardized methods for extracellular vesicle isolation and detection. Frank is currently a consultant for Decisive Science and is using artificial intelligence for the automatic identification of circulating tumor cells and vesicles in peripheral blood and diagnostic leukapheresis samples.

Frank Coumans PhD. Has developed the CellSearch CellTracks Analyzer II instrument. He was the first to show the prognostic significance of tumor-derived extracellular vesicles in samples of prostate cancer patients. He has developed and standardized methods for extracellular vesicle isolation and detection. According to his models, the majority of metastatic carcinoma patients have detectable circulating tumor cells, but the CellSearch method draws far too little blood to identify those cells. This model has given rise to the development of diagnostic leukapheresis, which does find circulating tumor cells in the majority of patients. Frank is currently a consultant for Decisive Science and is using artificial intelligence for the automatic identification of circulating tumor cells and vesicles in peripheral blood and diagnostic leukapheresis samples.

M Hackenberg

Full Professor at the Genetics Department of the University of Granada.

Michael Hackenberg is a Full Professor at the Genetics Department of the University of Granada (Spain). His main research lines are about DNA methylation and small RNAs with strong focus on the data analysis and interpretation of high-throughput sequencing experiments. He contributed to this field by coediting the book “Bioinformatics for High Throughput Sequencing” which was published by Springer in 2011 and by developing several, highly used tools and databases. Among those, miRanalyzer (originally published in 2009) and its successor sRNAbench are particularly successful with hundreds of monthly users. In 2014, along with collaborators from the University Medical Center in Amsterdam he founded ExBiome, a company dedicated to the development of next-generation non-invasive biomarkers. Furthermore, he was in charge of the bioinformatics node within the European Liquid Biopsy Academy Project (ELBA, Innovative Training Network) hosting two PhD students and several consortium meetings and workshops on the topic of liquid biopsy.

D De Carvalho

Leads research group at the Princess Margaret Cancer Centre and University of Toronto.

Founded and currently serves as CSO of Adela, a biotech company or cancer early detection, classification and monitoring therapy response.

Dr. De Carvalho is a renowned expert in cancer epigenomics and leads a research group at the Princess Margaret Cancer Centre and University of Toronto. He is a pioneer in the use of cancer epigenetics combined with advanced computational approaches for developing novel liquid biopsy tools applied to cancer early detection, classification and monitoring therapy response.Dr. De Carvalho has published over 85 high profile research papers, many of those featured in prestigious scientific journals such as Nature, Science, Cell, Nature Medicine, Cancer Cell among others and was an invited speaker to over 160 talks worldwide, including such prestigious venues as the Opening plenary lecture at AACR annual meeting. For his scientific contributions, Dr. De Carvalho received numerous awards including the AACR-Waun Ki Hong Award,Canadian Cancer Society Bernard and Francine Dorval Prize; Canadian Institutes of Health Research (CIHR) Early Career Award in Cancer. He received the Canada Research Chair in Cancer Epigenetics, the Helen M Cooke Endowed Professorship and was elected membership in the 2019 cohort of The Royal Society of Canada. Dr. De Carvalho founded and currently serves as CSO of Adela, a biotech company developing cell-free DNA methylation liquid biopsy technology for cancer early detection, classification and monitoring therapy response.

F Bidard

Professor of Medical Oncology at Institut Curie & Versailles University.
Vice-chair of the French breast cancer research group UCBG/Unicancer.

Francois-Clement Bidard, MD PhD, is a Professor of Medical Oncology at Institut Curie & Versailles University, and also the vice-chair of the French breast cancer research group UCBG/Unicancer. His clinical work is dedicated to breast cancer care, whereas his translational and clinical research focuses on liquid biopsies and new therapies. His contribution to the liquid biopsy field includes key landmark trials for CTC (STIC CTC, JAMA Oncol 2021 & JCO 2023) and ctDNA (PADA-1, Lancet Oncol 2022).

N Farkas

Partner at Alira Health.
Mentors digital health startups and teaches health policy at the University of Lucerne.

Norbert Farkas, a Swiss-Hungarian citizen, is a Partner at Alira Health, specializing in diagnostics clients. Previously, he founded and exited Centivis AG, a Swiss-based boutique consultancy focused on digital diagnostics market access and policy. With a background at Novartis and Roche global headquarters, he has supported various pharmaceuticals, vaccines, and in-vitro diagnostics launches. Norbert began his career at the European Parliament and holds a Master's in Economics from Budapest University of Economics and Public Administration, along with an MBA from the University of St. Gallen. He actively mentors digital health startups and teaches health policy at the University of Lucerne.

PV Nuzzo

Medical Oncologist and Instructor in Pathology and Medicine at Weill Cornell Medicine in New York.
MD and PhD in Transitional Medicine in Oncology and Hematology from the University of Genoa.

Dr. Pier Vitale Nuzzo is a Medical Oncologist and Instructor in Pathology and Medicine at Weill Cornell Medicine in New York.
Dr. Nuzzo earned his MD and PhD in Transitional Medicine in Oncology and Hematology from the University of Genoa. After completing his Medical Oncology Residency, he became a Postdoctoral Research Fellow at the Center for Functional Cancer Epigenetics, Dana-Farber Cancer Institute in Boston.
Dr. Nuzzo's primary research focuses on the epigenetic aspect of liquid biopsy in cancer detection and management. He made significant contribution on refining the cfMeDIP-seq protocol, a highly sensitive essay for non-invasive cancer diagnosis and classification through the analysis of tumor-specific methylation patterns in circulating cell-free DNA.

M Ignatiadis

Director of the Breast Medical Oncology Clinic.
Medical Oncology Department at the Jules Bordet Institute
(IJB) associate professor at the Université Libre de Bruxelles, Belgium.
Chair of the breast cancer group of the EORTC.

Michail Ignatiadis, MD PhD is the Director of the Breast Medical Oncology Clinic & Program, Medical Oncology Department at the Jules Bordet Institute (IJB) and associate professor at the Université Libre de Bruxelles, Belgium.
Since January 2021 is the chair of the breast cancer group of the EORTC. He is also leading the Academic Trials Promoting Team (ATPT) and he is member of the Executive and Research Boards of IJB since October 2016. From June 2018 to January 2021, he served in the Board of Directors of the EORTC as the chair of the clinical research division. He has been involved in many investigator initiated trials (IITs) sponsored by IJB at different stages of their development. He has been member of the Independent data monitoring committees for international trials and study chair of several IITs and industry sponsored trials.

F Pagni

Fabio Pagni, MD, is an Associate Professor of Pathology and the Director of the Residency Program in Pathology at University Milano Bicocca, Milan, Italy. He has spent the last years improving his knowledge in proteomics and NGS to detect new diagnostic approaches in pathology. Recently he coordinated the transition of his lab from a traditional workflow to digital pathology.

Fabio Pagni, MD, is an Associate Professor of Pathology and the Director of the Residency Program in Pathology at University Milano Bicocca, Milan, Italy. The main field of interest is molecular pathology, as the application of omics for the diagnosis of both neoplastic (thyroid) and inflammatory (kidney) conditions.
Fabio Pagni has spent the last years improving his knowledge in proteomics and NGS to detect new diagnostic approaches in pathology. The potential correlation of the proteomics profiles with the genomic data could help in discriminating new targets, transferable in the routine practice. Recently he coordinated the transition of his lab from a traditional workflow to digital pathology. Both light microscopy and fluorescence scanners were
introduced in the routine practice and changed the diagnostic process, offering a great resource for the research field, where the computational pathology era began.

D Sgroi

Dr. Sgroi is a Professor of Pathology at Harvard Medical School, the Executive Vice Chair of Pathology and a Member and Principal Investigator in the Division of Molecular Pathology Research and Center for Cancer Research at the Massachusetts General Hospital. Dr Sgroi has discovered and developed a unique breast cancer biomarker, the Breast Cancer Index that predicts for the risk of late disease recurrence and for treatment benefit from extended adjuvant hormonal therapy in ER+ breast cancer patients. Currently, his lab focuses on understanding the molecular functional role of HOXB13.

Dr. Sgroi is a Professor of Pathology at Harvard Medical School, and the Executive Vice Chair of Pathology and a Member and Principal Investigator in the Division of Molecular Pathology Research and Center for Cancer Research at the Massachusetts General Hospital. Dr Sgroi received his medical degree from the University of Connecticut School of Medicine. After completing a residency and chief residency in anatomic pathology at Massachusetts General Hospital, Dr Sgroi completed a postdoctoral research fellowship in molecular pathology under the direction of Dr. Ivan Stamenkovic at Massachusetts General Hospital.

The overarching goals of research in the Sgroi laboratory are to develop better ways to identify patients who are at risk for the development of breast cancer and to identify those breast cancer patients who are likely to benefit from targeted drug therapies. Dr Sgroi has discovered and developed a unique breast cancer biomarker, the Breast Cancer Index that predicts for the risk of late disease recurrence and for treatment benefit from extended adjuvant hormonal therapy in ER+ breast cancer patients. The Breast Cancer Index is the only test recognized by ASCO and NCCN guidelines for prediction of extended endocrine therapy benefit in early-stage, HR+ breast cancer. Currently, his lab focuses on understanding the molecular functional role of HOXB13, the gene that is primary determinant of endocrine therapy benefit for the Breast Cancer Index biomarker.

E Nicolò

Eleonora Nicolò is a medical oncologist specializing in breast cancer and translational research. Passionate about breast cancer research, Eleonora joined Dr. Massimo Cristofanilli's Laboratory at Weill Cornell Medicine focusing on applications of liquid biopsy in breast cancer.

Eleonora Nicolò is a medical oncologist specializing in breast cancer and translational research. She previously worked in the New Drugs and Early Drug Development for Innovative Therapies Division of the European Institute of Oncology (Italy), honing skills in managing and conducting early-phase clinical trials. Passionate about breast cancer research, Eleonora joined Dr. Massimo Cristofanilli's Laboratory at Weill Cornell Medicine in September 2022, focusing on applications of liquid biopsy in breast cancer. As a research fellow, she is dedicated to investigating circulating biomarkers, particularly circulating tumor cells and tumor-derived extracellular vesicles, to advance understanding and treatment strategies for breast cancer patients.

AS Pailhes-Jimenez

Anne-Sophie Pailhes -Jimenez is the manager of ANGLE Europe Limited. She has over 15 years experience in cellular biology and cancer investigation in the field of biotechnology and biopharmacy. She has led I+D activities for a greater characterization of the CTC. She has a Master degree in Biotechnological Engineering, specialized in molecular biology, from Institut National des Sciences Appliquées de Toulouse.

Anne-Sophie Pailhes -Jimenez is the manager of ANGLE Europe Limited. She joined ANGLE in 2016 and is responsible for all activities and projects of I+D laboratory. She has over 15 years experience in cellular biology and cancer investigation in the field of biotechnology and biopharmacy.Anne-Sophie, as an expert in cellular biology and inmunofluorescence technique, has managed multiple projects to develop later trials, including the dyeing of inmunofluorescence and molecular analysis. She has led I+D activities for a greater characterization of the CTC.

Prior to that, she worked as a senior scientist for six years at Gustave Roussy in Paris, where she gained wide experience in cellular biology in the oncology field.

Before joining ANGLE, Anne-Sophie managed the biology team in a biopharmacist company focussed on the development of innovative inmunotherapeutic solutions for cancer treatment. Anne-Sophie has a Master degree in Biotechnological Engineering, specialized in molecular biology, from Institut National des Sciences Appliquées de Toulouse (INSA Toulouse).

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