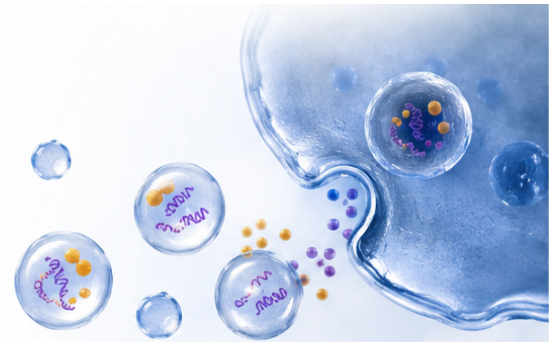




SOPHIE ROME

Director of Research – INRAE

Sophie Rome is a Director of Research at INRAE and team leader at the CarMeN Laboratory (Lyon, France). Her research explores how extracellular vesicles (EVs) and their molecular cargo—microRNAs and lipids—regulate inter-organ communication and contribute to metabolic health and disease.



Deciphering vesicle-mediated communication in metabolism to open new therapeutic avenues.

Born
22/02/1969

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RESEARCH FOCUS

We investigate the role of extracellular vesicles (EVs) in metabolic regulation, with a focus on skeletal muscle, immune cells and insulin-sensitive tissues. Our work integrates miRNAs, lipids and functional genomics to unravel mechanisms and identify new biomarkers and therapeutic targets.



KEY ACHIEVEMENTS

- Pioneered the role of skeletal muscle-derived EVs in myogenesis and inter-organ communication.
- Demonstrated that metabolic stress reshapes EV composition and function.
- Internationally recognized expert in EVs and metabolism.
- Founder of the INRAE-EV network.



LEADERSHIP

- Scientific Director at INRAE
- Team leader at CarMeN Laboratory (Lyon, France)
- Active member and contributor to the French Society for Extracellular Vesicles
- Building bridges across disciplines at the interface of nutrition, health and biology.



IMPACT

- 70+ peer-reviewed publications on EVs, miRNAs and metabolism
- Supervision of PhD students, postdocs and international trainees
- Multiple national and international grants
- Commitment to open science and scientific collaboration.

“ Understanding how extracellular vesicles communicate between cells and organs is key to tackling metabolic diseases. ”

Permanent position, Director of Research at INRAE Institute, department of Human Nutrition (<https://www.inrae.fr/en/human-nutrition-and-food-safety-division>)

EDUCATION

Institution and location	Degree	Completion date	Field of study
Université Claude-Bernard Lyon 1	PhD	16/04/1996	Environment, Phylogeny, Bioinformatics, Molecular Biology, soil microbiology, agronomy
University of Western-Australia, PERTH	Post-doc	1997-1998	Environment, Phylogeny, Bioinformatics, Molecular Biology, soil microbiology, agronomy
University of Paris 6	DU	2004	Génie Biologique et Médicale/valorisation industrielle
Université Claude-Bernard Lyon 1	HDR	2011	Role of Extracellular Vesicles released from skeletal muscle in metabolic diseases

2008 Team management (INRAE)

2010 Lyon 1 diploma: animal experimentation and studies, level 1

1- Summary of the scientific background

After completing her PhD and postdoctoral training in bioinformatics and molecular biology, S. Rome joined the CarMeN laboratory (Lyon, France) in 2001 to investigate the molecular mechanisms underlying skeletal muscle (SkM) insulin resistance in metabolic diseases. Her early research focused on identifying transcriptional alterations involved in the development of insulin resistance, leading her to develop recognised expertise in functional genomics, including microarray and RNA sequencing (RNA-seq) analyses, bioinformatics, and the mining of large-scale datasets.

Since 2006, her research has focused on the role of microRNAs (miRNAs) in insulin signalling, both within skeletal muscle and as cargo transported by extracellular vesicles (EVs). Her pioneering work demonstrated that SkM-derived EVs play an active role in myogenesis and mediate the transfer of miRNAs and lipids between cells under both physiological and diabetic conditions, thereby contributing to inter-organ communication between insulin-sensitive tissues.

More recently, her group has shown that macrophage-derived EVs are key mediators of the immune response and that metabolic stress induced by high glucose levels or lipid overload alters the composition and biological activity of these vesicles, ultimately

affecting skeletal muscle homeostasis. Her current research focuses on identifying the lipid species carried by EVs that mediate their biological effects on recipient cells.

S. Rome is internationally recognised for her expertise in extracellular vesicles and metabolism. She contributed to the creation of the French Society for Extracellular Vesicles and recently founded the INRAE-EV network, which brings together researchers across INRAE working on extracellular vesicles in the fields of agronomy, nutrition, and health.

2- Positions and scientific appointments

2027-2032	Scientific Director-INRAE, PI at CarMeN Laboratory, Lyon-France (Director M-C Michalski)
2022-2026	Scientific Director-INRAE, PI at CarMeN Laboratory, Lyon-France (Director Hubert Vidal)
2020-2022	Scientific Director-INRAE, Visiting Scientist at Institut of functional Genomic/ENS-Lyon)
2015-2020	Scientific Director-INRAE, PI at CarMeN Laboratory, Lyon-France (Director Hubert Vidal)
2013-2015	Project Leader of INSERM – INDIAN MEDICAL RESEARCH COOPERATION (Chennai)
2012-2014 :	Co-project leader of "diabetes and the wessel wall injury" programm (INSERM-Astrazeneca, Gutterburg)
2001-2015	Senior scientist CR1, CarMeN Laboratory, Lyon-France (Director Hubert Vidal)
1998-2001	Junior Scientist CR2 at INRAE institute, INAP-G Paris-France (Director Daniel Tomé)
1998-1999	Junior Scientist CR2 at INRAE institute, Visiting Scientist at NUS Singapore/IMCB (Group P. Lobie)

3- Honors and Awards

1996	European Awards Program: Post-doctoral funding to work in Australia (UWA)
2015	Laureate from the international program France-Sweden 'TOR' (https://french-nordic-research.se/wp-content/uploads/2023/10/ROME_SOPHIE_TR.pdf)
2017	Price from Olga Triballat Foundation (http://www.institut-olga-triballat.org)
2017	Price from Benjamin Delessert Institut (http://www.institut-benjamin-delessert.net/fr/prix/presentation/Utilisation-des-nanovesicules-extracellulaires-de-jus-de-fruits-pour-restaurer-lhomeostasie-glucidique/?displayreturn=true)
2025	Aesthetics prize for the best scientific image from Lyon 1 University, depicting extracellular vesicles in human macrophages (https://carmen.univ-lyon1.fr/en/lab-events/prix-art-in-lyon-2025-pour-sophie-rome-en/)

4- Supervision of students and postdoctoral fellows

Post-doc: Stefano Tacconi (PMID: 39534483; PMID: 38539237; doi.org/10.1101/2025.01.26.634912; PMID: 41471070; PMID: 40984725; PMID: 38151475)

Thèses:

Jérémy Besson (PMID: 19590847)

Alexis Forterre (PMID: 24196440; PMID: 24392111; PMID: 25073444; PMID: 26852333; PMID: 31447684; PMID: 3473279)

Hala Aswad (PMID: 25073444; PMID: 27038912; PMID: 26852333)

Prabu Paramasivam (PMID: 26020947; PMID: 30165157; PMID: 35120179; PMID: 35881589)

Laura Reininger (PMID: 34732797)

Rosa Doñate Puertas (PMID: 29723239; PMID: 28427903)

Hanae Talbi (2023-2025)

Sanjay B Vasan (ongoing: 2025-2027)

Training of International Student on extracellular vesicle:

Ilaria Spatocco (2026, University of Napoli), Martina Ceci (2023, Università del Chieti, Italy), Carolina Sbarigia (2023, Università de la Sapienza, Roma), Gérard Yapi (2023, university of Ottawa, FFR project), Stefano Tacconi (2019-2020, Università del Salento, Italy), Léa Garneau (2020, Univ. Ottawa, laureate from IDEX Lyon), Rafaella C. Pordeus Luna (2018, Univ. Paraíba, Brasil), Morgan Mc Millan (2017, Univ. Ottawa), Claire Edrington (2016, Univ. Ottawa).

5- Major grants

*1998 : Research contract with Danone

*2008 : Institut des Systèmes Complexes, Université Lyon 1 (1,000 euros, Co-PI)

*2008 : Département of Human Nutrition, INRAE (5,000 euros, PI)

*2006-2008 : European program "DIOGENES" (Funding for technician salaries)

*2002 : Programme Bioinformatique Inter EPST, Action Financement de la Recherche/université de Lyon (1,000 euros, PI)

*2002-2008 : PhD student scholarship for Jérémy Besson, ASC program of INRAE

*2010: AFM (36,000 euros (microarray data analysis)

*2010: Société Française de Diabétologie (30,000 euros, PI)

*2011: Fondation pour la recherche Médicale (140,000 euros, PI)

*2011: Département of Human Nutrition, INRAE (5,000 euros, PI)

*2011: Clinal study_PHRC-IMAGE (10,000 euros (circulating miRNA)

*2012: Astrazeneca (140,000 euros (Co-project Leader, project on exosomes)

*2012: Programme ANR Blanc INCA projet PIBIO (218,400 euros, WP on exosomes)

*2015: Travel grants for India to develop collab. between Madras Diabetes Research Foundation, Chennai, India and INSERM

*2017: BENJAMIN DELESSERT foundation (30,000 PI)

*2017: OLGA TRIBALLAT foundation (40,000, PI)

*2019-2020: VML foundation (Vaincre les Maladies Lysosomales) (30,000 Partner, project on exosomes)

- *2020-2021: Contract of Research with Pilèje (gestion EZUS-Université Lyon1 (PI)
- *2022-2023: Contract of Research with Pilèje (gestion EZUS-Université Lyon1 (PI)
- *2019-2023: ANR Zenith (583 847 euros, co-partner and WP leader)
- *2021-2021: FFR to start collaboration between the University of Ottawa and CarMeN lab (5,000 euros, Co-PI)
- *2021-2027: ANR MEXID (496 048 euros Coordinator and WP leader, <https://anr.fr/Projet-ANR-21-CE14-0081>)
- *2024-2028: ANR PlexoMiR (669 559 euros, co-partner and WP leader,)

6- Conferences

Invited speaker in instituts

- *2007: Journée Scientifique microARNs, organized by the department PHASE/INRAE
- *2008, 2009: Seminar of Applied Biosystems microARNs/LYON
- *2011: Centre Méditerranéen de Médecine Moléculaire. Inserm-Nice
- *2013: Centre de Biologie du Développement. Toulouse

keynote lectures:

- *2014: Role of muscle-released exosomal miRNAs in the field of diabetes and muscle physiology. University of Oxford. M. Wood.
- *2019: plenary speaker: 2nd meeting French Society of Extracellular Vesicles: Extracellular vesicles released from the adipose tissue. Nantes
- *2020: Skeletal muscle release extracellular vesicles: state of the art. 8 avril 2020; I-STEM Virtual conference.
- *2023: plenary speaker: Tissue cross-talk via the extracellular vesicles in metabolic diseases. Danish Diabetes and Endocrine Academy. Denmark
- *2024: plenary speaker: Obesity and Extracellular Vesicles released from skeletal muscle. French Association for research on Obesity. Nantes.
- *2025: Keynote speaker, Danish Society for Extracellular vesicles. September. Aarhus. Denmark.
- *2025: Keynote speaker: EXTRACELLULAR VESICLES FROM SKELETAL MUSCLE DETERMINE MUSCLE STEM CELL FATE. SAPIENZA, ROME, ITALY

Lecture during symposium (invited):

- *2011: Seminar at the French Embassy of Berlin on "Nutrigenomics" (organised by INRAE and DDZ)
- *2014: Journée de l'Innovation en Diabétologie de Montpellier organized by Sanofi: « Role des microRNAs contenus dans les exosomes dans la différentiation musculaire et le cross-talk entre organes »
- *2014: Exosomes in intra- and inter-organ communications in the field of diabetes. 2nd Workshop AstraZeneca, Drug Discovery Research Collaboration', Mölndal Sweden
- *2014: Role of muscle-released exosomal miRNAs in the field of diabetes and muscle physiology. Chennai (INDIA)
- *2015: Ecole de la Société Française de Nutrition (Paris) : Exosomes et miRNAs (FRANCE)
- *2016: Extracellular microRNAs as integrative Biomarkers of Nutrition and metabolic diseases. Sun Yat-sen University. GuangZhou
- *2018: Exosomal miRNAs participate in organ cross talk during the development of metabolic diseases associated with high-fat diets. Toulouse. Institut de Recherche en Santé Digestive (FRANCE).
- *2019: Grand Ouest-EV Network: Nanovesicles derived from plants: an exemple with the orange juice (Angers, FRANCE)
- *2019: Clinical implications of fat-derived EVs in obesity. FSEV. Nantes, FRANCE
- *2022: Skeletal muscle extracellular vesicles. FSEV. Paris, FRANCE
- *2025: The ever-expanding RNA world. University of de Lausanne. Switzerland

7- Other activities

Executive boards: 2006-2016: Executive Board member of INRAE division 'Nutrition, Chemical Food Safety and Consumer Behaviour'; 2007-2016: Expert in the scientific Committee which evaluates INRAE scientist activities; 2007-2013: Expert in INRAE CNOC Committee (Technology Platforms evaluation and funding); President of FSEV (2017-2022); Adjunct ISEV board member (2019-2022); Board member of the Graduate⁺ MuskLe (University Lyon 1, since 2022, graduate-plus.fr/en/musculo-skeletal-system-locomotion-exercise-2); WP leader of the european project COFUND MuSkLE (2026-2031, <https://www.muskle.eu/>), Ethic committee of Lyon 1 University (2026-2028) - **Reviewing of grant applications:** Michigan Diabetes Research Center (USA); Gouvernement of Canada (Discovery Grants Program - Individual); Diabetes Research and Wellness Foundation (England); AFM-Thélétion france; International Human Frontier Science Program Organization; Israël Science Foundation (ISF); Agence de la biomédecine Appel d'offres "AMP, Médecine; Paul G. Allen Frontiers Group (USA); Diabetes Research Center at Washington University (USA). Internal projects of Sapienza university (Italy), Agence Nationale de la Recherche en France (ANR)- **Reviewing of papers for:** JEV, JExBiol; Nature com; ASCNano; JCS; PNAS Nexus; Cell Report; JCSM, Cell stem; JAS; Sci. Rep, J lipid research, J obesity....- **Seminar/meeting organisations** : « Transcriptomic analyses » (2007, INRAE); « Modelisation and biomedical research » (2008, University Lyon 1); « Heart Rhythm Research. Insights from Advanced Computational Modelling and Simulation » (Lyon-Est Hospital, 2008); "machine learning and epidemiology" (2015, University Lyon 1); FSEV National meeting (2016 and 2017); AFERO National Meeting (2018); CIO (co-chair) ISEV International Meeting (2021; 2022); INRAE National Symposium on Extracellular Vesicles (2023, 2024, 2025-); Co-organization of the Summer School MuSkLe (2022; 2023; 2024, 2025, 2026).

PhD defense and HDR committees : <https://theses.fr/098395939>. **Patent:** #EP25306216.0, INSERM transfert (use of S1P18/S1P16 ratios for skeletal muscle regeneration)

8- Publications

9,867 Research Interest Score, 22,512 Citations
 46 h-index
<https://scholar.google.com/citations?user=sxKvYWQAAAAJ&hl=fr&oi=ao>
https://www.researchgate.net/profile/Sophie-Rome-2?ev=hdr_xprf
<https://pubmed.ncbi.nlm.nih.gov/?term=Rome+S+and+france&sort=date>