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2025 *Activity Report*

RESEARCH CENTRE: **Inria Centre at Rennes University**

IN PARTNERSHIP WITH: **Université Sorbonne Paris Nord, Assistance Publique – Hôpitaux de Paris**

Project-Team

AIMOKA

Advanced and Innovative MOdeling for percutaneous Cancer tumor Ablations

Project-Team AIMOKA

Creation of the Project-Team: 2025 November 01

Each year, Inria research teams publish an Activity Report presenting their work and results over the reporting period. These reports follow a common structure, with some optional sections depending on the specific team. They typically begin by outlining the overall objectives and research programme, including the main research themes, goals, and methodological approaches. They also describe the application domains targeted by the team, highlighting the scientific or societal contexts in which their work is situated. The reports then present the highlights of the year, covering major scientific achievements, software developments, or teaching contributions. When relevant, they include sections on software, platforms, and open data, detailing the tools developed and how they are shared. A substantial part is dedicated to new results, where scientific contributions are described in detail, often with subsections specifying participants and associated keywords. Finally, the Activity Report addresses funding, contracts, partnerships, and collaborations at various levels, from industrial agreements to international cooperations. It also covers dissemination and teaching activities, such as participation in scientific events, outreach, and supervision. The document concludes with a presentation of scientific production, including major publications and those produced during the year.

Keywords

Computer sciences and digital sciences

A6.1. – Methods in mathematical modeling

A6.2. – Scientific computing, Numerical Analysis & Optimization

A6.3. – Computation-data interaction

Other research topics and application domains

B2.4. – Therapies

B2.6. – Biological and medical imaging

Contents

1 Team members, visitors, external collaborators

Research Scientists

- Clair Poignard [Team leader, INRIA, Senior Researcher, from Nov 2025, HDR]
- Olivier Sutter [CHU AVICIENNE AP-HP, from Nov 2025]

Faculty Member

- Olivier Seror [UNIV PARIS XIII, Professor, from Nov 2025]

PhD Students

- Juliette Codevelle [INRIA, from Nov 2025]
- Audrey Gossard [INRIA, from Nov 2025]

Administrative Assistant

- Lydie Mabil [INRIA]

2 Overall objectives

Percutaneous ablations (PA) are minimally invasive, image-guided treatments that destroy tumors using energy or chemicals. They are an effective option for patients unable to undergo surgery, with fewer complications. However, challenges like incomplete treatment, collateral damage, and procedural complexity, especially for electrical field techniques, limit their broader use. Liver and pancreatic cancers, with high mortality rates, could benefit from approaches like electroporation combined with drug or immune therapies. This project aims to develop advanced numerical tools to assist interventional radiologists from planning to follow-up, focusing on radiofrequency and electroporation-based ablations (EMPA) for the liver and pancreas. Bridging in vitro modeling with clinical practice, the project seeks to integrate insights from cell spheroid models into macroscale tissue simulations, improving the precision and effectiveness of percutaneous ablations in routine care.

2.1 Objectives

AIMOKA proposes to innovate percutaneous tumor ablations thanks to a combination of advanced computational strategies and machine learning approaches. The project aims to develop a new digital- assisted interventional radiology research area to revolutionize ElectroMagnetic-based Percutaneous Ablations (EMPA) of complex deep-seated tumors, specifically liver and pancreatic cancers. From the interventional radiology research area, the computational advances will assist the operator during and after the ablation procedure, providing on the one hand a real-time and personalized evaluation of EMPA and on the other hand posttreatment numerical markers for the patient follow-up. The project aims also to propose clinical study for complex cases combining different existing therapeutical strategies. From the mathematical oncology view point, AIMOKA aims to improve the modeling of the mechanical and electrical properties of highly desmoplastic tumors, which are hyperdense hypovascularized tumors for which therapeutical options are limited. Indeed, this kind of tumors, among them fibrotic hepatocellular carcinoma and pancreatic adenocarcinoma, are highly resistant to standard therapies, partly because too few cytotoxic molecules reach the tumor site, and also because cancer cells are sparsely spread within the host tissue, making surgery ineffective in many cases. Electroporation-based ablation combining (ir)reversible electroporation and cytotoxic or immunotherapeutic drugs might revolutionize the care of deep-seated tumors.

2.2 Grand Challenges

AIMOKA scientific themes lay within the Inria scientific theme Digital Health. The project is highly interdisciplinary between numerical science and interventional radiology to address the following crucial challenges in the care of abdominal tumors by percutaneous ablation:

- Per procedural evaluation and optimization of EMPA for deep-seated tumors.
- Quantitative evaluation criteria of EMPA based on medical imaging to improve the patient's follow up.
- Treatment of highly desmoplastic tumors assisted by advanced percutaneous ablation strategies.

From the computer/mathematical side, the main challenges can be summarized into 3 main points

- Numerical methods for medical imaging registration with partial field of views and different modalities,
- Fast and accurate resolution of direct and inverse problems of electric field distribution on medical images for intraoperative applications,
- Multiscale mathematical mechanistic modeling of innovative therapies based on pulsed electric field, from cell to tissue scales.

3 Research program

AIMOKA research area lies within the computational interventional radiology. We identified 3 interlaced computational domains, which will lead to the innovative interventional radiology: the computational medical imaging, in order to enable multimodal image registration with partial field of view, the electrical characterization of the tissues thanks to impedancemetry, which combined with the computational medical imaging will enable a fast and accurate computation of the electric field distribution. The mathematical model of electric field ablation research topic aims to provide innovative ablation protocols in particular in terms of electric field delivery parameters, drug distribution and immune response description. It aims to better anticipate treatment failures, and to provide quantitative information to physicians during the ablation to possibly adjust the treatment. The work plan is organized around 3 main research axes with well-defined application targets, and a transverse numerical axis.

3.1 Research Axis1: New medical imaging criteria based on numerical markers

Task leader: Olivier Seror
Involved staffs: Clair Poignard, Olivier Sutter

Research Axis 1 is devoted to the interventional radiology (IR) research area. The goals are threefold. First, we aim to take advantage of the long-term expertise of the IR department of Avicenne Hospital to develop standardized image-based evaluation criteria for EMPA to improve the patient's follow-up. The second goal is to propose innovative therapeutical strategies for HCC, by a combination of existing techniques. The third objective aims to popularize the use of electroporation among the interventional radiologists by proposing courses combining medical practice and numerical simulations.

3.2 Research Axis2: New numerical image-based marker for per-operative evaluation of EPA.

Task leader: Olivier Sutter
Involved staffs: Clair Poignard, Olivier Seror

Research Axis 2 is dedicated to electroporation ablations. The first task will consist in developing numerical strategies to enable the evaluation of the electroporation ablation during the procedure. Intraoperative evaluation is crucial because electroporation is a complex technique, used in complex cases: the adjustment of the treatment during the procedure based on quantitative criteria should help the IRs to minimize the treatment failures. The second task will consist in determining numerical criteria of the treatment response, within the weeks and months after the procedure.

3.3 Research Axis3: Mathematical modeling of electroporation-based treatment on preclinical studies.

Task leader: Clair Poignard
Involved staffs: Olivier Sutter

Research Axis 3 is devoted to the modeling of electroporation combined with chemo and/or immuno-therapies, with tight links with experiments provided by external closed collaborations. This axis is not focused towards immediate clinical applications, but we strongly believe that a research continuum from the modeling aspects of biological experiments up to the clinical applications is important. Therefore, any dead end of this axis will not impact the progress of the 2 previous axes. The first task will be devoted to develop mathematical descriptions of the impact of electroporation ablation on the uptake of drugs in spheroids and microtumors, as well as the electroporation-induced release of damage associated molecular patterns (DAMPs) that trigger an adaptive immune response against tumors. The second task is focused on the modeling of DNA vaccination by means of electroporation, a still emergent but promising therapy of cancer, that consists in transferring non-coding DNA plasmids to cell to generate immune response targeted towards cancer cells. The last task is devoted to the modeling of innovative contact-less electroporation to avoid the drawbacks of needle insertion.

3.4 Transverse Axis: Numerical tools for digital interventional radiology.

Task leader: Clair Poignard
Involved staffs: Olivier Sutter

The 3 above Research Axes require numerical tools at each step: for the computation of the involved partial differential equations used for the multimodal registration and the computation of the electric field, and for the ML/DL approaches to identify markers. The aim of the transverse axis is to unify, as far as possible, the numerical methods. However, for specific numerical tasks that could emerge from Axis3 without a direct impact on the clinical application, we will use existing software.

4 Application domains

AIMOKA is intrinsically a translational applied project, which aims to integrate digital research innovations into the interventional radiology operating room, providing physicians with almost real-time quantification of interventional procedures. The tight collaboration between mathematicians and interventional radiologists will foster advancements in digital interventional radiology research and ensure a swift transfer of innovations to the operating room. We strongly believe that achieving these goals requires high-level advancements in mathematics (nonlinear PDEs, numerical schemes, the combination of data-driven and physics-driven numerical strategies, etc.) and in clinical research in interventional radiology (quantitative criteria adapted to new ablation therapies, integration of tumor-specific characteristics into patient follow-up, etc.). In a way, the goal of significant societal impact, demands high-level academic achievements in both the digital field and interventional radiology.

5 Social and environmental responsibility

All studies conducted within the AIMOKA project will comply with the principles of the 1975 Declaration of Helsinki and will be approved by the relevant institutional or independent ethics review boards. For each use of patient data, informed consent will be obtained for prospective studies, and the absence of opposition will be verified for retrospective studies. Data management procedures and patient information will be handled with particular care, in close collaboration with the Data Protection Officers (DPO) and Information Systems Departments (DSI) of the participating institutions (Inria, AP-HP).

5.1 Footprint of research activities

Particular attention will be paid to the environmental footprint of the research activities. International conference participation will be carefully selected in order to maximize scientific impact while minimizing carbon emissions. It is also worth noting that the team's objective is to develop numerical strategies for use in the operating room; therefore, computations on high-performance computing facilities will be strictly limited to what is essential.

5.2 Impact of research results

Thanks to advanced computational, statistical, and machine-learning approaches, AIMOKA aims to enhance percutaneous ablation therapies, with a particular focus on electroporation-based treatments. The digital tools developed within AIMOKA are expected to have a significant impact on clinical oncology by providing a novel real-time computational criterion for evaluating treatment efficacy. In close integration with experimental work, the computational quantification of immune-response hallmarks may lead to new strategies for boosting the immune system through in silico optimization. While artificial intelligence approaches in oncology are currently applied across a wide range of diseases using standard machine-learning or deep-learning methods, AIMOKA primarily focuses on liver and pancreatic tumors to deliver novel computational and DL-based insights. Nevertheless, the project also holds strong potential for broader applications, particularly in colorectal, prostate, and breast cancers, where percutaneous ablation—and especially electroporation combined with drug delivery—offers promising treatment options for the future.

6 Highlights of the year

• Official creation of the team on November 1rst, 2025.
• The ANR project DEVIN, led by Clair Poignard, and whose Olivier Seror and Olivier Sutter are members has been accepted by the PRC ANR call (start 01/02/2026 to 31/01/2030). It is devoted to DNA vaccination modeling and involves the IPBS at Toulouse and the ILM and Ampère at Lyon.

7 Latest software developments, platforms, open data

7.1 Software developments

• Clinical_IRE

In collaboration with the team MONC at the Inria Centre at Bordeaux Univ., we developed the 3D slicer plugin Clinical_IRE the electric field during an irreversible electroporation (IRE) ablation procedure. The operator enters the positions of the needles on the image (by clicking), as well as the different regions based on pre-established segmentations. The selected amplitude dose map is then superimposed on the image. It is based upon the C++ library IRENA for the high order computation of the electroquasistatic electric field.

• Evo_estimator

In collaboration with the team MONC at the Inria Centre at Bordeaux Univ., we developed the 3D slicer plugin Evo_estimator which enables the non-rigid multimodal registration. It is based upon a full python code.

8 New results

8.1 Numerically assisted irreversible electroporation for hepatocellular carcinoma

Participants: Clair Poignard, Olivier Seror, Olivier Sutter.

Our retrospective numerical modeling [13] of irreversible electroporation showed a strong correlation with local outcomes in hepatocellular carcinoma. Insufficient tumor coverage by the electric field was associated with treatment failure. A threshold of 400 V/cm emerged as the most predictive dose for local recurrence. Tumor coverage below 95% at this level strongly predicted IRE failure and recurrence localization. The numerical ground of the software Clinical_IRE is based upon a hybrid deep-learning/advanced computing strategy as presented in [15, 16]. The full paper is under submission.

8.2 Correlation between computed electric dose maps and early post-operative MRI for the evaluation of IRE

Participants: Clair Poignard, Olivier Seror, Olivier Sutter.

In our study [12] we retrospectively evaluated irreversible ablations using data from 22 patients who underwent IRE liver ablation (one patient underwent two distinct IRE procedures), resulting in a total of 23 procedures. The most accurate correspondence between predicted and observed ablation zones was achieved using a dose threshold of approximately 350 V/cm, yielding a median Dice Similarity Coefficient (DSC) around 0.74, indicative of substantial spatial overlap. Although elastic DIR approaches applied to segmented liver regions provided the highest registration accuracy, the simpler translational registration based on manually selected landmarks demonstrated surprisingly robust performance in localizing the simulated EF within the actual ablation zone. Significance. These findings contribute to the standardization of IRE efficacy assessment on MRI and highlight the significant potential EF simulations to predict the extent of tissue ablation in IRE procedures for HCC. This approach may offer a valuable tool for improving intraoperative decision-making and post-operative assessment.

8.3 The role of early MRI in assessing the risk of local tumor progression following irreversible electroporation for hepatocellular carcinoma treatment

Participants: Clair Poignard, Olivier Seror, Olivier Sutter.

In our study [11], D3MRI appears to be a valuable tool for assessing the true ablation margins in HCC nodules treated with IRE and for identifying potential sites of local recurrence. It may, therefore, be considered for integration into the follow-up protocol for patients undergoing IRE treatment for HCC.

8.4 Machine learning based radiomic models outperform clinical biomarkers in predicting outcomes after immunotherapy for hepatocellular carcinoma

Participants: Olivier Sutter.

In our study [14], we show that Radiomic-based models predict survival outcomes and response to immunotherapy in patients with advanced HCC. Deep learning in combination with machine learning can stratify patients and allows for precision treatment strategies.

8.5 Asymptotic analysis of the static bidomain model for pulsed field cardiac ablation

Participants: Clair Poignard.

Cardiac arrhythmias are caused by faulty electrical signals in the heart, which lead to chaotic wave propagation and impaired cardiac function. The work presented in [10] focuses on a non-thermal ablation technique based on electroporation (EP), a promising method for treating arrhythmias, called pulsed field ablation (PFA).

Assuming that the thickness of the electroporated region is small compared to the whole domain and that the intracellular conductivity within the EP region scales with a factor proportional to the square of the thickness parameter, we derive an electrophysiological model of a cardiac domain containing a region ablated by PFA. We then provide a formal asymptotic analysis at any order by considering an asymptotic expansion of the intracellular and extracellular potentials both outside and inside the EP domain in a static nonlinear context. This allows us to derive transmission conditions at the interface at any order. Moreover, we give a proof of the asymptotic expansion by deriving estimates of the H^1- and L^2-norms of the errors of an expansion with a given number of terms. The asymptotic expansion has been validated by numerical convergence tests.

9 Partnerships and cooperations

9.1 National initiatives

9.1.1 Plan Cancer MIC project MECI

Participants: Clair Poignard *(PI)*, Olivier Seror, Olivier Sutter.

Title: MECI: Mathematical Models of Electroporation Ablation Combined with Immunotherapy for Liver and Pancreas Tumors

Partner Institution(s):

- IPBS, Toulouse, France
- CHU Poitiers, France

Date/Duration: 02/02/2022-01/02/2026

9.1.2 ANR PRC project MIRE4VTACH

Participants: Clair Poignard *(PI)*, Audrey Gossard.

Title: MIRE4VTACH: Modeling of Irreversible Electroporation for Ventricular Tachycardia

Partner Institution(s):

- Nantes University, France
- IHU LIRYC, Bordeaux, France

Date/Duration: 02/02/2022-01/02/2027

9.1.3 ANR PRCE project IMITATE

Participants: Clair Poignard *(co-PI)*, Juliette Codevelle.

Title: IMITATE: Integrated Microsystems for In silico Modeling and in vitro assessment of nanoparticle TrAnsport & radioTherapy Efficacy.

Partner Institution(s):

- Institut Lumière Matière (Leader), Lyon, France

- Ingénierie des Matériaux Polymères, Université Lyon1, France
- LBTI, CNRS & Université Lyon1, France
- Nano-H company, Lyon France

Date/Duration: 02/02/2022-01/02/2027

10 Dissemination

10.1 Promoting scientific activities

10.1.1 Scientific Society

Clair Poignard is Medical Applications Officer of the International Society of Electroporation-Based Treatments and Technology (ISEBTT).

10.1.2 Journal

Member of the editorial boards

- Clair Poignard is co-editor-in-chief of Mathematical Modeling in Natural Phenomena Journal.
- Clair Poignard is member of the editorial boards of Bioelectrochemistry Journal, DCDS-S, and AIMS Bioengineering.

10.1.3 Invited talks

- Clair Poignard was invited plenary speaker at the International Conference on Advances in Electroporation-Based Therapy: From Principles to Clinical Applications at Erice (Italy.)
- Clair Poignard was invited plenary speaker at the International Conference on Mathematical Methods and Models in Biosciences (BIOMATH) at Sofia, Bulgaria.
- Clair Poignard was invited plenary speaker at the International Conference Mathematical, Computational, and Experimental Approach in Cardiovascular and Cancer Research, at NYU Abu Dhabi, (UAE).

10.2 Teaching - Supervision - Juries - Educational and pedagogical outreach

10.2.1 Supervision

- Clair Poignard is joint-supervisor with Baudouin Denis de Senneville of the Phd students Kylian Desier (defense in december 2025), Heloise Dudoignon (on-going).
- Clair Poignard is joint-supervisor with Annabelle Collin of the Audrey Gossard and with Charlotte Rivière and Estelle Bastien of Juliette Codevelle.

10.2.2 Juries

- Clair Poignard was president of the PhD jury of Théo Le Berre (Ampère Lab, Univ. Lyon1).
- Clair Poignard was reviewer of the HDR of Valéry Ozenne (RMSB, Univ. Bordeaux), and Charles Engelhardt (CHU, Univ. Bordeaux).
- Clair Poignard was examiner of the PhD defense of Christian Fotso (LJAD, Univ. Nice Côte d'Azur).

10.2.3 Educational and pedagogical outreach

Clair Poignard teaches a course on electroporation (36h) within the Master Santé Numérique de Univ. Rennes.

11 Scientific production

11.1 Major publications

[1] E. Inacio, L. Lafitte, L. Facq, C. Poignard and B. Denis de Senneville. 'Adaptive local boundary conditions to improve deformable image registration'. In: *Physics in Medicine and Biology* 69.16 (8th Aug. 2024), p. 165025. DOI: 10.1088/1361-6560/ad6952. URL: https://inria.hal.science/hal-04719267.

[2] P. Jaramillo-Aguayo, A. Collin and C. Poignard. 'Phase-field model of bilipid membrane electroporation'. In: *Journal of Mathematical Biology* 87.18 (July 2023). DOI: 10.1007/s00285-023-01956-y. URL: https://inria.hal.science/hal-04145549.

[3] M. S. Leguèbe, M. G. Notarangelo, M. Twarogowska, R. Natalini and C. Poignard. 'Mathematical model for transport of DNA plasmids from the external medium up to the nucleus by electroporation'. In: *Mathematical Biosciences* 285 (Mar. 2017), pp. 1–13. DOI: 10.1016/j.mbs.2016.11.015. URL: https://inria.hal.science/hal-01412380.

[4] P. Mistani, A. Guittet, C. Poignard and F. Gibou. 'A Parallel Voronoi-Based Approach for Mesoscale Simulations of Cell Aggregate Electropermeabilization'. In: *Journal of Computational Physics* (Jan. 2019). DOI: 10.1016/j.jcp.2018.12.009. URL: https://inria.hal.science/hal-01779598.

[5] L. C. Pescatori, M. Dessain, G. N'kontchou, A. Petit, A. Diallo, L. Blaise, M.-P. Rols, C. Poignard, J.-C. Nault, N. Ganne-Carrié, P. Nahon, O. Sutter and O. Seror. 'The role of early MRI in assessing the risk of local tumor progression following irreversible electroporation for hepatocellular carcinoma treatment'. In: *International Journal of Hyperthermia* 42.1 (28th May 2025), pp. 1–8. DOI: 10.1080/02656736.2025.2505595. URL: https://hal.science/hal-05322273.

[6] O. Sutter, L. Lafitte, O. Seror, C. Poignard and B. Denis de Senneville. 'Correlation between computed electric dose maps and early post-operative MRI for the evaluation of irreversible electroporation'. In: *Physics in Medicine and Biology* (27th Oct. 2025), pp. 1–19. DOI: 10.1088/1361-6560/ae1802. URL: https://hal.science/hal-05337772.

[7] O. Sutter, D. Voyer, J.-P. Tasu and C. Poignard. 'How impedance measurements and imaging can be used to characterize the conductivity of tissues during the workflow of an electroporation-based therapy'. In: *IEEE Transactions on Biomedical Engineering* 71.4 (Apr. 2024), pp. 1–9. DOI: 10.1109/TBME.2023.3336193. URL: https://inria.hal.science/hal-04361148.

[8] C. Vaghi, R. Fanciullino, S. Benzekry and C. Poignard. 'Macro-scale models for fluid flow in tumour tissues: impact of microstructure properties'. In: *Journal of Mathematical Biology* 84 (Feb. 2022), p. 27. DOI: 10.1007/s00285-022-01719-1. URL: https://hal.science/hal-02891573.

[9] D. Voyer, A. Silve, L. M. Mir, R. Scorretti and C. Poignard. 'Dynamical modeling of tissue electroporation'. In: *Bioelectrochemistry* 119 (Mar. 2018), pp. 98–110. DOI: 10.1016/j.bioelechem.2017.08.007. URL: https://inria.hal.science/hal-01598846.

11.2 Publications of the year

International journals

[10] A. Collin, S. Nati Poltri and C. Poignard. 'Asymptotic Analysis of the Static Bidomain Model for Pulsed Field Cardiac Ablation'. In: *Mathematical Methods in the Applied Sciences* (31st Oct. 2025), pp. 1–22. DOI: 10.1002/mma.70267. URL: https://inria.hal.science/hal-05400401 (cit. on p. 8).

[11] L. C. Pescatori, M. Dessain, G. N'kontchou, A. Petit, A. Diallo, L. Blaise, M.-P. Rols, C. Poignard, J.-C. Nault, N. Ganne-Carrié, P. Nahon, O. Sutter and O. Seror. 'The role of early MRI in assessing the risk of local tumor progression following irreversible electroporation for hepatocellular carcinoma treatment'. In: *International Journal of Hyperthermia* 42.1 (28th May 2025), pp. 1–8. DOI: 10.1080/02656736.2025.2505595. URL: https://hal.science/hal-05322273 (cit. on p. 8).

[12] O. Sutter, L. Lafitte, O. Seror, C. Poignard and B. Denis de Senneville. 'Correlation between computed electric dose maps and early post-operative MRI for the evaluation of irreversible electroporation'. In: *Physics in Medicine and Biology* (27th Oct. 2025), pp. 1–19. DOI: 10.1088/1361-6560/ae1802. URL: https://hal.science/hal-05337772 (cit. on p. 8).

[13] O. Sutter, B. D. de Senneville, L. Lafitte, D. Voyer, J.-P. Tasu, A. Petit, T. Molango, L.-C. Pescatori, O. Seror and C. Poignard. 'Toward perioperative, numerically assisted irreversible electroporation for hepatocellular carcinoma: clinical outcomes informed by numerical simulations'. In: *European Radiology* (19th Dec. 2025). DOI: 10.1007/s00330-025-12223-7. URL: https://hal.science/hal-05475629 (cit. on p. 7).

[14] M. Vithayathil, D. Koku, C. Campani, J.-C. Nault, O. Sutter, N. Ganne-Carrié, E. Aboagye and R. Sharma. 'Machine learning based radiomic models outperform clinical biomarkers in predicting outcomes after immunotherapy for hepatocellular carcinoma'. In: *Journal of Hepatology* 83.4 (Oct. 2025), pp. 959–970. DOI: 10.1016/j.jhep.2025.04.017. URL: https://inria.hal.science/hal-05475619 (cit. on p. 8).

International peer-reviewed conferences

[15] K. Desier, L. Lafitte, L. Facq, O. Sutter, C. Poignard and B. Denis de Senneville. 'A deep learning-assisted hybrid model for electric dosimetry in electroporation therapies'. In: CBMS 2025 - International Symposium on Computer-Based Medical Systems. Madrid, Spain: IEEE, 2025, pp. 1–4. URL: https://hal.science/hal-05060101 (cit. on p. 8).

[16] K. Desier, L. Lafitte, L. Facq, O. Sutter, O. Seror, C. Poignard and B. Denis de Senneville. 'Deep modelling of electric field distribution for clinical electroporation ablation therapies'. In: ISBI 2025 - International Symposium on Biomedical Imaging. Houston (TX), United States, 2025, pp. 1–5. URL: https://hal.science/hal-05060090 (cit. on p. 8).

Reports & preprints

[17] S. Bihoreau-Duchemin, A. Collin, M. Leguèbe and C. Poignard. *Mathematical Derivation of a Homogenized Bidomain Model for Pulsed Field Ablation*. Sept. 2025. URL: https://inria.hal.science/hal-05368825.

Other scientific publications

[18] O. Sutter and L.-c. Pescatori. *AI -Based Prognostic Stratification in HCC , Towards a Personalised Treatment Approach*. 14th Mar. 2025. DOI: 10.1111/liv.16153. URL: https://inria.hal.science/hal-05475621.