

Team Activity Report – 2024 (Period: 01.01 - 31.12)

Deadline: February 3rd, 2025

Unit	U1288
Team	Laboratory of Translational Imaging in Oncology (LITO)
Team leader	Irène Buvat
Title (Pr or Dr)	DRCE1 CNRS
Label (ex: Ligue, Labex, ATIP-Avenir,...)	n/a
Researcher unique identifier(s) (such as ORCID, Research ID, etc.)	ORCID: 0000-0002-7053-6471
SCIENTIFIC PRODUCTION	
List of Publications indicating -Impact factor (IF) if known -DOI	1. Captier N, Lerousseau M, Orlhac F, Hovhannisyan-Baghdasarian N, Luporsi M, Woff E, Lagha S, Salamoun Feghali P, Lonjou C, Beaulaton C, Salmon H, Walter T*, Buvat I*, Girard N*, Barillot E*. Integration of clinical, pathological, radiological, and transcriptomic data improves the prediction of first-line immunotherapy outcome in metastatic non-small cell lung cancer. Nature Commun, 16:614, 2025 (accepted 2024). DOI: https://doi.org/10.1038/s41467-025-55847-5 IF=14.7 2. Lekadir K, Frangi AF, Porras AR, Glocker B, Cintas C, Langlotz CP, Weicken E, Asselbergs FW, Prior F, Collins GS, Kaissis G, Tsakou G, Buvat I, Kalpathy-Cramer J, Mongan J, Schnabel JA, Kushibar K, Riklund K, Marias K, Amugongo LM, Fromont LA, Maier-Hein L, Alberich LC, Martí-Bonmatí L, Cardoso MJ, Bobowicz M, Shabani M, Tsiknakis M, Zuluaga MA, Fritzsche MC, Camacho M, Linguraru MG, Wenzel M, De Bruijne M, Tolsgaard MG, Goisauf M, Abadía MC, Papanikolaou N, Lazrak N, Pujol O, Osuala R, Napel S, Joshi S, Klein S, Aussó S, Rogers WA, Puig-Bosch X, Salahuddin Z, Starmans MPA, and the FUTURE-AI Consortium. FUTURE-AI: International consensus guideline for trustworthy and deployable artificial intelligence in healthcare. BMJ British Medical Journal, in press (accepted 2024), 2025. IF=93.7 3. Bonfrate A, Ronga MG, Patriarca A, Heinrich S, De Marzi L. Monte Carlo modeling of a commercial machine and experimental setup for Flash-Minibeam irradiations with electrons. Med Phys, 1-11, 2024. DOI: https://doi.org/10.1002/mp.17492 IF=3.2 4. Granado-González M, Price T, Gonella L, Moustakas K, Hirono T, Hemperek T, De Marzi L, Patriarca A. First test beam of the DMAPS-based proton tracker at the pMBRT facility at the Curie Institute. Phys Med Biol. 69(21), 2024. DOI: 10.1088/1361-6560/ad84b3. IF=3.3 5. Potiron S, Iturri L, Juchaux M, Espenon J, Gilbert C, McGarrigle J, Ortiz Catalan R, Fernandez-Rodriguez A, Sebríe C, Jourdain L, De Marzi L, Créhange G, Prezado Y. The significance of dose heterogeneity on the anti-tumor response of minibeam radiation therapy. Radiother Oncol. 201:110577, 2024. DOI: 10.1016/j.radonc.2024.110577. IF=4.9

6. Renard S, Parent L, **De Marzi L**, Tsoutsou P, Kirova Y. Electron radiation therapy: Back to the future? *Cancer Radiother.* 28(6-7):553-559, 2024. DOI: [10.1016/j.canrad.2024.07.013](https://doi.org/10.1016/j.canrad.2024.07.013). IF=1.5
7. Gesualdi F, **de Marzi L**, Dutreix M, Favaudon V, Fouillade C, Heinrich S. A multidisciplinary view of flash irradiation. *Cancer Radiother.* 28(5):453-462, 2024. DOI: [10.1016/j.canrad.2024.07.003](https://doi.org/10.1016/j.canrad.2024.07.003). IF=1.5
8. **Sitarz M**, **Ronga MG**, Gesualdi F, **Bonfrate A**, Wahl N, **De Marzi L**. Implementation and validation of a very-high-energy electron model in the matRad treatment planning system. *Med Phys*, in press, 2024. DOI: [10.1002/mp.17392](https://doi.org/10.1002/mp.17392). IF=3.2
9. Loap P, Vu-Bezin J, **De Marzi L**, Kirova Y. Proton therapy reduces the effective dose to immune cells in breast cancer patients. *Strahlenther Onkol.* in press, DOI: [10.1007/s00066-024-02263-1](https://doi.org/10.1007/s00066-024-02263-1). IF=2.7
10. González-Vegas R, Yousef I, Seksek O, Ortiz R, Bertho A, Juchaux M, Nauraye C, **Marzi L**, Patriarca A, Prezado Y, Martínez-Rovira I. Investigating the biochemical response of proton minibeam radiation therapy by means of synchrotron-based infrared microspectroscopy. *Sci Rep.* 14(1):11973, 2024. DOI: [10.1038/s41598-024-62373-9](https://doi.org/10.1038/s41598-024-62373-9). IF=3.8
11. Legdeur N, Badissi M, Venkatraghavan V, Woodworth DC, **Orlhac F**, Vidal JS, Barkhof F, Kawas CH, Visser PJ, Corrada MM, Muller M, Rhodius-Meester HFM. The temporal relation of physical function with cognition and the influence of brain health in the oldest-old: The UCI 90+ Study and EMIF-AD 90+ Study. *Gerontology*, in press, 2024. IF=3.1
12. **Seban RD**, **Champion L**, De Moura A, Lerebours F, Loirat D, Pierga JY, Djerroudi L, Genevee T, **Huchet V**, **Jehanno N**, Bidard FC, **Buvat I**. Pre-treatment [18F]FDG PET/CT biomarkers for the prediction of antibody-drug conjugates efficacy in metastatic breast cancer, *Eur J Nucl Med Mol Imaging*, in press, 2024. IF=8.6
13. **Buvat I**, Weber WA. Is ChatGPT a reliable ghostwriter? *J Nucl Med*, 65(10):1499-1502, 2024. DOI: [10.2967/jnumed.124.268341](https://doi.org/10.2967/jnumed.124.268341). IF=9.1
14. Paty LP, Deguelldre S, **Provost C**, Schmitt C, **Trump L**, **Fouque J**, Vriamont C, Valla F, Gendron T, **Madar O**. Development of a versatile [⁶⁸Ga]Ga-FAPI-46 automated synthesis suitable to multi-elutions of germanium-68/gallium-68 generators. *Front Chem*, 12:1411312. *Front Chem*, 2024. DOI: [10.3389/fchem.2024.1411312](https://doi.org/10.3389/fchem.2024.1411312). IF=3.8
15. **Loap P**, **De Marzi L**, Decroocq J, Birsén R, Johnson N, Deau Fischer B, Bouscary D, Kirova Y. Proton Therapy Reduces the Effective Dose to Immune Cells in Mediastinal Hodgkin Lymphoma Patients. *Int J Part Ther*, 13:100110, 2024. DOI: [10.1016/j.ijpt.2024.100110](https://doi.org/10.1016/j.ijpt.2024.100110). IF=2.1
16. Loap P, Vu-Bezin J, **De Marzi L**, Kirova Y. Proton therapy reduces the effective dose to immune cells in breast cancer patients. *Strahlenther Onkol.* in press, 2024. DOI: [10.1007/s00066-024-02263-1](https://doi.org/10.1007/s00066-024-02263-1). IF=2.7
17. Bertho A, Ortiz R, Maurin M, Juchaux M, Gilbert C, Espenon J, Ramasamy G, Patriarca A, **De Marzi L**, **Pouzoulet F**, Prezado Y. Thoracic Proton Minibeam Radiation Therapy: Tissue Preservation and Survival Advantage Over Conventional Proton Therapy. *Int J Radiat Oncol Biol Phys*, 120(2):579-592, 2024. DOI: [10.1016/j.ijrobp.2024.04.011](https://doi.org/10.1016/j.ijrobp.2024.04.011). IF=6.4
18. Massis H, Degombert MH, **Dindart J**, Lazard D, Trésallet C, **Frouin F**, Pillot-Loiseau C. Le rythme : un marqueur d'atteinte du nerf laryngé

supérieur ? 35èmes Journées d'Études sur la Parole (JEP 2024) 31ème Conférence sur le Traitement Automatique des Langues Naturelles (TALN 2024) 26ème Rencontre des Étudiants Chercheurs en Informatique pour le Traitement Automatique des Langues (RECITAL 2024), Jul 2024, Toulouse, France. pp.461-469. <https://inria.hal.science/hal-04623096> No IF

19. Boellaard R*, **Buvat I***, **Nioche C**, Ceriani L, Cottureau AS, Guerra L, Hicks RJ, Kanoun S, Kobe C, Loft A, Schöder H, Versari A, Coltin CA, Zwezerijnen GJC, Zijlstra JM, Mikhaeel NG, Gallamini A, El-Galaly TC, Hanoun C, Chauvie S, Ricci R, Zucca E, Meignan M, Barrington SF. International benchmark for total metabolic tumor volume measurement in baseline 18F-FDG PET/CT of lymphoma patients: a milestone towards clinical implementation. *J Nucl Med*, 65:1343-1348, 2024. DOI: 10.2967/jnumed.124.267789. IF=9.1
20. Le TK, Comte V, Darcourt J, Razzouk-Cadet M, Rollet AC, **Orlhac F**, Humbert O. Performance and clinical impact of radiomics and 3D-CNN models for the diagnosis of neurodegenerative parkinsonian syndromes on [18F]-FDOPA PET. *Clin Nuc Med*, 49(10):924-930, 2024. DOI: 10.1097/RLU.0000000000005392. IF=10.0
21. **Captier N**, **Orlhac F**, **Hovhannisyan-Baghdasarian N**, **Luporsi M**, Girard N, **Buvat I**. RadShap: an explanation tool for highlighting the contributions of multiple regions of interest to the prediction of radiomic models. *J Nucl Med*, 65:1307-1312, 2024. DOI: <https://doi.org/10.2967/jnumed.124.267434> IF=9.1
22. Haberl D, Spielvogel CP, **Orlhac F**, Iommi D, **Buvat I**, Haug AR, Papp L. Multicenter PET Image Harmonization using Generative Adversarial Networks. *Eur J Nucl Med Mol Imaging*, 51:2532-2546, 2024. DOI: 10.1007/s00259-024-06708-8. IF=8.6
23. **Hovhannisyan-Baghdasarian N**, **Luporsi M**, **Captier N**, **Nioche C**, **Cuplov V**, **Woff E**, Hegarat N, Livartowski A, Girard N, **Buvat I**, **Orlhac F**. New promising candidate prognostic biomarkers in [18F]FDG-PET images: evaluation in independent cohorts of NSCLC patients. *J Nucl Med*, 65:635-642, 2024. DOI: 10.2967/jnumed.123.266331 IF=9.1
24. Kocak B, Akinci D'Antonoli T, Mercaldo N, Alberich-Bavarri A, Baessler B, Ambrosini I, Andreychenko A, Bakas S, Beets-Tan R, Bressen K, **Buvat I**, Cannella R, Cappellini LA, Cavallo AU, Chepelev LL, Chu LCH, Demircioglu A, deSouza NM, Dietzel M, Fanni SC, Fedorov A, Fournier LS, Giannini V, Girometti R, Groot Lipman KBW, Kalarakis G, Kelly B, Klontas ME, Koh DM, Kotter E, Lee HY, Maas M, Marti-Bonmati L, Müller H, Obuchowski N, **Orlhac F**, Papanikolaou N, Petrash E, Pfaehler E, Pinto dos Santos D, Ponsiglione A, Sabater S, Sardanelli F, Seeböck P, Sijtema NM, Stanzione A, Traverso A, Ugga L, Vallières M, van Dijk LV, van Griethuysen JJM, van Hamersvelt RW, van Ooijen P, Vernuccio F, Wang A, Williams S, Witowski J, Zhang Z, Zwanenburg A, Cuocolo R. METHodological RadiomICs Score (METRICS): a quality scoring tool for radiomics research endorsed by EusoMII. *Insights into Imaging*, 15:8, 2024. DOI: <https://doi.org/10.1186/s13244-023-01572-w> IF=4.1
25. Fraioli F, Albert A, Boellaard R, Boscolo Galazzo I, Brendel M, **Buvat I**, Castellaro M, Cecchin D, Fernandez PA, Guedj E, Hammers A, Kaplar Z, Morbelli S, Papp L, Shi K, Tolboom N, Traub-Weidinger T, Verger A,

	Van Weehaeghe D, Yakushev I, Barthel M. Perspectives of the European Association of Nuclear Medicine on the role of artificial intelligence (AI) in molecular brain imaging. Eur J Nucl Med Mol Imaging, 51(4):1007-1011, 2024. DOI: 10.1007/s00259-023-06553-1 IF=8.6 26. Girum KB, Cottureau AS, Vercellino L, Rebaud L, Clerc J, Casasnovas O, Morschhauser F, Thieblemont C, Buvat I. Tumor location relative to the spleen is a prognostic factor in lymphoma patients: a demonstration from the REMARC trial. J Nucl Med, 65(2):313-319, 2024. DOI: 10.2967/jnumed.123.266322 IF=9.1 27. Cottureau AS, Rebaud L, Trotman J, Feugier P, Nastoupil LJ, Bachy E, Flinn IW, Haïoun C, Ysebaert L, Bartlett NL, Tilly H, Casasnovas O, Ricci R, Portugues C, Buvat I, Meignan M, Morschhauser F. Metabolic tumor volume predicts outcome in advanced stage follicular lymphoma patients from the Relevance trial. Ann Oncol, 35:130-137, 2024. DOI: https://doi.org/10.1016/j.annonc.2023.10.121 IF=56.7 28. Mahé M, Beddok A, Goudjil F, Ala Eddine C, Bolle S, Champion L, Feuvret L, Herman P, Zefkili S, Choussy O, Le Tourneau C, Dendale R, Buvat I, Sauvaget E, Créange G, Calugaru V. Curative high-dose reirradiation for patients with recurrent head and neck adenoid cystic carcinomas: outcomes and analysis of patterns of failure. Int J Radiat Biol, 100:79-86, 2024. DOI: 10.1080/09553002.2023.2242934. IF=2.1 29. Whybra P, Zwanenburg A, Andrearczyk V, Schaer R, Apte AP, Ayotte A, Baheti B, Bakas S, Bettinelli A, Boellaard R, Boldrini L, Buvat I, Cook GJR, Dietsche F, Dinapoli N, Gabryś HS, Goh V, Guckenberger M, Hatt M, Hosseinzadeh M, Iyer A, Lenkowicz J, Loutfi MAL, Löck A, Marturano A, Morin O, Nioche C, Orlhac F, Pati S, Rahmim A, Rezaeijoo SM, Rookyard CG, Salmanpour MR, Schindele A, Shiri I, Spezi E, Tanadini-Lang S, Tixier F, Upadhaya T, Valentini V, van Griethuysen JJM, Yusefirizi F, Zaidi H, Müller H, Vallières M, Depeursinge A. The Image Biomarker Standardization Initiative: Standardized Convolutional Filters for Reproducible Radiomics and Enhanced Clinical Insights. Radiology, 310: e231319, 2024. DOI: https://doi.org/10.1148/radiol.231319 IF=12.1 30. C Malhaire. Radiomics in 18F-FDG PET/CT predicts HER2 status in breast cancer with equivocal immunohistochemistry, Eur J Radiol 170:111238, 2024. DOI: 10.1016/j.ejrad.2023.111238 IF=3.2
H factor for team leader and average citation index, indicating source (Webscience, etc.)	Irène Buvat H-index Web of Science Core Collection = 50 Average citation index (articles only, abstracts excluded) Web of science = 70 H-index google scholar = 57 Total number of citations google scholar = 22,600 - Web of Science = 14,359
List of Patents -Title -Reference N° -Date -List of people involved	1. Radiomic signatures for solid cancer prognosis before immunotherapy initiation, EP24305892.2, June 2024, Irène Buvat, Victor Comte, Hornella Fokem Fosso, Fanny Orlhac 2. Method for processing 3D imaging data and assisting with prognosis of cancer, international extension 18/863,355 of EP2023/063366, November 2024, Irène Buvat, Kibrom Girum
List of scientific highlights in 2024 (Publication or other)	1. Paper in Nature Communications resulting from a collaboration between U1288, U900 and the Dpt of Medical Oncology at Institut Curie, and

- 5 max.	demonstrating the power of multi-omic (clinical, radiomic, pathomic and omic) data integration for predicting patient outcome. Output of the Sign'it TIPIT project (Captier et al, Nature Comm 2025). 2. Participation in an international consortium to produce recommendations for the development and deployment of Artificial Intelligence in healthcare, published in the British Medical Journal (Lekadir et al, BMJ, IF=93.7). 3. Participation in the development of an on-line interactive tool to assess the quality of a radiomic study (Kocak et al, Insights Imaging 2024, top 0.1% citations). 4. Development and patenting of a clinic-radiomic signature to predict response to immune-(chemo) therapy of NSCLC patients: EP24305892.2 5. Co-organization of a 2-week long international workshop dedicated to system medicine hosted by Institut Pascal in Paris Saclay University (www.empower2024.org)
Other written productions of the team (e.g.: book chapter, etc.) - 5 max.	n/a
List of software developed -Name -Version -Release date	1. LIFEx: https://lifexsoft.org/index.php/product/overview-of-versions Two official releases in 2024: V7.6.0 and 7.7.0 (April 2024). More than 9,000 users in the world end of 2024. 2. Multipit: https://github.com/sysbio-curie/multipit developed by Nicolas Captier, in collaboration with U900. V1.
List of startup -Name -Date of creation -Team members	n/a
ORGANIZATION OF SCIENTIFIC MEETINGS - INSTITUTIONAL RESPONSABILITIES	
List of invitations to meetings and seminars (in France or international) -Meeting title -Date -Place -Presentation title -Authors	1. IABM 2024 : Colloque français d'Intelligence Artificielle en Imagerie Médicale, 15-26 March 2024, Grenoble Intégration de données cliniques, pathologiques, radiologiques et transcriptomiques pour l'élaboration de modèles prédictifs, I Buvat, invited speaker 2. Académie Nationale de Médecine – Séance "L'intelligence artificielle en santé", 2 April 2024, Paris L'IA appliquée à l'imagerie médicale, I Buvat, invited speaker 3. 8th Annual MSK Symposium on Lymphoma, 26-27 April 2024, MSKCC New York Advances in radiomics, I Buvat, invited speaker 4. Rice University & Université PSL Inaugural Research Summit, 13-14 May 2024, Paris Translational imaging in Oncology, I Buvat, invited speaker 5. Society of Nuclear Medicine and Molecular Imaging meeting, 8-11 June 2024, Vancouver, Canada AI Principles and the Issue of Model Generalization, I Buvat, invited speaker

	6. Society of Nuclear Medicine and Molecular Imaging meeting, 8-11 June 2024, Vancouver, Canada Arena session: why are we publishing what we are publishing ? I Buvat, invited speaker 7. Congrès annuel de la Société d’Imagerie de la Femme, 14 June, Nantes Bilan pré-thérapeutique: IRM pour toutes ? C Malhaire, invited speaker 8. Artificial Intelligence 4 Imaging, 24-27 June, Maastricht, The Netherlands. Multi-centric radiomics. F Orlhac, invited speaker 9. ICCR 2024: XX th International Conference on the use of Computers in Radiation therapy, 8-11 July 2024, Lyon Are we ready to use radiomics and AI for patient management in radiation oncology? I Buvat, keynote speaker 10. International Invasive Lobular Symposium, 24 September, Leuven, Belgium Imaging primary and metastatic ILC, Tumor response prediction in neo-adjuvant setting., C Malhaire, invited speaker 11. France-Taiwan joint workshop, Translational research in Cancer and Biotech, 12-13 October 2024, Taipei, Taiwan Whole-body molecular phenotyping of cancer for precision medicine. I Buvat, invited speaker. 12. Dauphine Digital Day, 18-20 November 2024, Paris ‘IA et imagerie médicale : outils, usages et enjeux éthiques’, I Buvat, invited speaker in a round table 13. Masterclass Radiothérapie et Cancer de la Prostate, 29-30 November, Paris Personnalisation de la radiothérapie guidée par l’intelligence artificielle, I Buvat, invited speaker 14. Retreat of the Laboratoire de Biologie du Développement, IBPS, Institut de Biologie Paris Seine, 5-6 December 2024, Évry Courcouronnes L’intelligence artificielle va-t-elle révolutionner la détection et la prise en charge du cancer du sein ? I Buvat, invited speaker
List of organized meetings, workshops, seminars (indicate if at Curie, in France or international) <i>-Meeting title</i> <i>-Date</i> <i>-Place</i> <i>-Presentation title</i> <i>-Authors</i>	1. International: Course on Radiomics: theory and practice. 8-10 April 2024, Paris. Irène Buvat, Narinée Hovhannisyan, Jimmy Mullaert, Christophe Nioche, Fanny Orlhac co-organizers. 2. International: Co-organization of the presentation of the SNMMI AI challenge results as part of the SNMMI Annual meeting, 8-11 June 2024, Vancouver, Canada. Ronald Boellaard and Irène Buvat co-organizers. 3. International: Co-organization of the Empower 2024 workshop, a 2-week long workshop dedicated to system medicine hosted by Institut Pascal in Paris Saclay University (www.empower2024.org), 7-18 October 2024, Saclay. Ramsey Badawi, Irène Buvat, Thomas Beyer, Simon Cherry, Lalith Sundar, Rob ter Horst co-organizers.
Public outreach (TV, radio, press...), specify if PI or Team members name: <i>-Topic</i> <i>-Audience (eg. Researchers, general public)</i> <i>-Media</i>	1. Interview for Le Figaro regarding the article entitled “Urease–powered nanobots for radionuclide bladder cancer therapy ” published in the Nature Nanotechnologies, January 22nd, 2024, Irène Buvat. 2. “Après une chirurgie cervicale, de nouveaux échographes pour détecter les complications laryngées”, 28 February 2024, Le Quotidien du Médecin, VOCALISE group: F Frouin, A Rouxel, C Lin and C Trésallet.

<i>-Date</i>	3. “Non-Invasive Ultrasound Technique Helps Identify Life-Changing Complications after Neck Surgery”, 01 Mar 2024 MedImaging.net VOCALISE group: F Frouin, A Rouxel, C Lin and C Trésallet. 4. “Pioneering ultrasound research could prevent complications from neck surgery”, International Hospital & Equipment – featured on Enews homepage – 10 April 2024, VOCALISE group: F Frouin, A Rouxel, C Lin and C Trésallet. 5. “VOCALE : une nouvelle technique d’échographie pour dépister les complications laryngées post thyroïdectomies”, 7 JOURS À L'AP-HP, 6 June 2024, VOCALE: F Frouin, C Trésallet. 6. Participation in the campaign "Jonquille contre le cancer 2024" : De l’imagerie de pointe à l’IA : l’image au service de l’innovation dans la lutte contre les cancers du sein. Conférence de presse, 19 september 2024, Irène Buvat. 7. Interview for the publication of a special issue on Cancer in “Le Figaro Madame”, 25 september 2024, Irène Buvat. 8. Interview for Europe 1 regarding the role of Artificial Intelligence in medical imaging, broadcasted on October 1st 2024, Irène Buvat. 9. Interview “L’intelligence artificielle au service de la prise en charge des cancers du sein”, France Culture, 2 October 2024, Caroline Malhaire. 10. Webconference Patients en réseau “Cancers du sein lobulaires : Quelles spécificités ? Quelles perspectives ?”, 15 October 2024, Caroline Malhaire. 11. Participation to the writing of a science-fiction paper for the wide audience journal FLAASH, special issue on AI, Autumn 2024, Irène Buvat. 12. Participation in Declics : Dialogues Entre Chercheurs et Lycéens pour les Intéresser à la Construction des Savoirs (visio) : 29 November 2024 - Lycée général Clémence Royer - Toulouse – Fonsorbes. C Thomas. 13. Interview for the writing of an article in Science Ouest - IA dans la recherche en cancérologie, 2 december 2024, Irène Buvat. 14. Contribution to an article in the “IA et Santé” report for the magazine “Notre Temps”, 10 december 2024, Irène Buvat.
Expertise: commissions of trust (ERC panel, CNRS & Inserm Committees, advisory boards, etc.) <i>-Name</i> <i>-Elected or nominated member</i> <i>-Period of mandate (start & end if known)</i>	1. Irène Buvat and Fanny Orlhac, member of the Artificial Intelligence Task Force of the Society of Nuclear Medicine and Molecular Imaging, USA (nominated), 2019-now. 2. Irène Buvat, Christophe Nioche, Fanny Orlhac, members of the International Biomarker Standardization Initiative (IBSI), 2018-now. 3. Irène Buvat, Institut Pascal, Université Paris Saclay, member of the scientific committee (nominated), 2016-now. 4. Irène Buvat, member of the “Commission Institutionnelle d’Ethique” of Institut Curie, 2021-now. 5. Irène Buvat, member of CSS7 Inserm, 2022-now. 6. Fanny Orlhac, member of JANE 2 – EU Joint action - network of expertise on hi-tech medical resources – Domain 2: Radiomics, 2024-now. 7. Caroline Malhaire, participant in COST action CA19138 (LOBASTERPOT): Contributed to the European network for collaborative research on invasive lobular breast cancer. 2020-2024.
Board memberships (e.g.: journal editor, etc.)	1. Associate editor of the “Journal of Nuclear Medicine” (IF=9.1): management of ~ 60 manuscripts every year, since 2020. Irène Buvat 2. Associate editor of “Molecular Imaging and Biology” (IF=3.0): management of ~ 4 manuscripts every year, since 2020. Irène Buvat, Fanny Orlhac 3. Board member of “European Journal of Nuclear Medicine and Molecular Imaging” (IF=8.6): management of ~ 5 manuscripts every year, since 2019. Irène Buvat

	4. Board member of “EJNMMI Research” (IF=3.1): management of ~2 manuscripts every year. Irène Buvat 5. Board member of “Physics in Medicine and Biology” (IF=3.3): management of ~10 manuscripts every year. Frédérique Frouin. 6. Womens’ imaging Section Editor of « European Journal of Radiology » (IF= 3.2), management of ~ 15 manuscripts every year. Caroline Malhaire.
Memberships of Scientific Societies	1. Member of the Society of Nuclear Medicine and Molecular Imaging, Irène Buvat, Fanny Orlhac 2. Member of the European Alliance of Medical and Biological Engineering and Science (EAMBES), Irène Buvat 3. Member of the European Association of Nuclear Medicine, Irène Buvat, Fanny Orlhac, Marie Luporsi 4. Member of the European Society of Radiology, Irène Buvat 5. Member of the IEEE society, Irène Buvat 6. Member of the Société Française de Photobiologie, Carole Thomas 7. Member of the IEEE Engineering in Medicine and Biology Society, Frédérique Frouin 8. Member of the European Organisation for Research and Treatment of Cancer (EORTC) Imaging group, Caroline Malhaire 9. Member of Declics (Dialogues Entre Chercheurs et Lycéens pour les Intéresser à la Construction des Savoirs). Carole Thomas 10. Member of « l’Arbre des connaissances ». Carole Thomas
Other expertise (reviewer for scientific journals, expert for national and international funding bodies, e.g. ANR, ERC, etc)	1. Regular reviewers (>3 papers per year) for scientific journals: Journal of Nuclear Medicine (I Buvat, F Orlhac, RD Seban), Physics in Medicine and Biology (F Frouin), European Journal of Nuclear Medicine and Molecular Imaging (I Buvat, RD Seban), EJNMMI Research (I Buvat), EJNMMI Physics (I Buvat, F Orlhac), Molecular Imaging and Biology (I Buvat), Eur Radiology (F Frouin, F Orlhac, C Malhaire), Breast Cancer Research and Treatment (C Malhaire), Scientific Reports (C Malhaire), Cancers (C Thomas, L Champion, RD Seban), Cancer management and research (C Thomas), International Journal of Molecular sciences (C Thomas), International Journal of Radiation Oncology Biology and Physics (C Thomas), Investigative Ophthalmology and visual science (C Thomas), J Material chemistry B (C Thomas), J Porphyrin Phthalocyanines (C Thomas), Marine drugs (C Thomas), Nanoscale (C Thomas), Photochemical and Photobiological Sciences (C Thomas), Sci Pharm (C Thomas), Cancer management and research (C Thomas), PhotoDiagnosis and Photodynamic Therapy (C Thomas), Pharmaceuticals (C Thomas), European Journal of Cancer (RD Seban). 2. Expertise for international funding bodies: - Institut Jules Bordet, Belgium (grants) (I Buvat) - AIRC, Italy (grants) (I Buvat) - Society of Nuclear Medicine and Molecular Imaging (USA) Faber Award (F Orlhac) - Hanarth Fonds, the Netherlands (grants) (I Buvat) 3. Expertise for national funding bodies: - ANR (I Buvat, F Frouin) - ANRT CIFRE grants (I Buvat, F Frouin) - Association Ruban Rose (I Buvat) - Inserm First step program (I Buvat) - INCA (I Buvat) - Ligue contre le Cancer (F Frouin) - MESSIDORE (Inserm) (F Frouin)

	- Université Paris Saclay, ED 575, Concours Doctorants (F Frouin) 4. Reviews for international meetings: - Society of Nuclear Medicine and Molecular Imaging annual meeting (I Buvat, F Orlhac) - European Association of Nuclear Medicine annual meeting (I Buvat, F Orlhac) - European Congress of Radiology (I Buvat) - European Society of Molecular Imaging (ESMI) meeting (I Buvat, F Orlhac) 5. PhD thesis committees: - Safa Tahri, Planification directe sur IRM en radiothérapie externe par des approches d'apprentissage automatique, Université de Rennes, April 2024, I Buvat reviewer. - Nicolas Captier, Multimodal analysis of radiological, pathological, and transcriptomic data for the prediction of immunotherapy outcome in Non-Small-Cell Lung Cancer patients, Université PSL, May 2024, I Buvat, Thesis co-supervisor. - Louis Rebaud, Biomarqueurs corps entier en imagerie par Tomographie d'Emission de Positons (TEP), Université Paris Saclay, May 2024, I Buvat, Thesis supervisor. - Fahad Khalid, Magnetic Resonance Imaging and Genomic Mutation in Diffuse Intrinsic Pontine Glioma : Machine Learning Approaches for a Comprehensive Analysis, Université Paris Saclay, January 2024, F Frouin, Thesis Supervisor. - Erwan Dereure, Quantitative analysis of bioluminescent signals in preclinical imaging, Sorbonne Université, Avril 2024, F Frouin, Thesis Reviewer. - Amine Bouhama, Développement et intégration dans un environnement clinique de la chaîne de traitement permettant la stratification des cancers pulmonaires par radiogénomique, Université Lyon 1, March 2024, F Orlhac, examiner. - Shamimeh Ahrari, Implémentation de la radiomique en routine clinique : approche individuelle et analyse de la composante temporelle par des approches d'apprentissage automatique en TEP pour la neuro-oncologie, Université de Lorraine, September 2024, F Orlhac reviewer. - Vincent Zossou, Détection des lésions hépatiques basée sur les images tomodensitométriques et l'apprentissage automatique, Université Paris-Saclay, December 2024, F Orlhac examiner. 7. Habilitation committees: - Antoine Grigis, Interprétabilité des modèles d'apprentissage en études de population afin d'explorer des phénotypes de neuroimagerie multi-modaux, Université Paris Saclay, 2024, I Buvat, reviewer - Laetitia Imbert, Les nouveaux détecteurs en médecine nucléaire : applications cliniques et perspectives, Université de Lorraine, 2024, I Buvat, reviewer.
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	- Jérémie Calais, Clinical and Translational Research in Radiotheranostic, Université Paris Saclay, 2024, I Buvat examiner. - Anne-Ségolène Cottureau, Biomarqueurs en Imagerie TEP, Université Paris Cité, 2024, I Buvat examiner.
CLINICAL ACTIVITIES	
Link with Curie Hospital or other -Person -Project -Fundings	1. Curie Hospital: Hervé Brisse / Caroline Malhaire (Medical Imaging department): Neotex, Radiomics in breast MRI to predict response to neoadjuvant chemotherapy. Participation in the EORTC BCG 1984 trial and in the IHU project. 2. Curie Hospital: François Clément Bidard (Medical Oncology) / Julien Fouque (Dpt of pharmacy) / Laurence Champion, Nina Jehanno and Hervé Brisse (Dpt of medical imaging), Fatima Mechta Grigoriou (Research center): Ga68-FAPI synthesis for clinical imaging of Fibroblast Activation Protein activation, PMS Sein funding and RHU Cassiopeia. 3. Curie Hospital: Nicolas Girard (Dpt of Thoracic Oncology), Nina Jehanno and Marie Luporsi (Dpt of Nuclear Medicine, Paris), Hervé Brisse (Dpt of Radiology, Paris): Radiomic approaches for lung cancer precision medicine, TIPIT project (Fondation Arc funding), Precision Predict project (BPI and Health Data Hub funding), NEMO-PET project (ANR JCJC funding) 4. Curie Hospital: Nathalie Cassoux (Dpt of Onco-ophtalmology), François Doz (Dpt of Onco-pediatrics), PhotoDynamicTherapy project for retinoblastoma treatment, Retinostop (fundings: PSL, Fondation l'Occitane, Retinostop) 5. Curie Hospital: Retinomics : F Frouin, L Cardoen Dpt of Radiology. 6. Other - Centre Antoine Lassagne - Nice: FEDERATED-PET: Olivier Humbert (Dpt of Nuclear Medicine) and Marco Lorenzi (Inria): first french federated learning initiative based on PET images to predict response to immunotherapy for lung cancer patients (PRTK) 7. Other - Dpt of Nuclear Medicine, Cochin Hospital, Paris: Anne-Ségolène Cottureau, Design and validation of PET imaging prognostic biomarkers for lymphoma patients. Siemens funding as part of a CIFRE contract with Louis Rebaud. 8. Other - Dpt of Radiology, Avicenne Hospital, Bobigny: Pierre-Yves Brillet, IRMomics in lung cancer patients (LITO funding). 9. Other – Dpt of Surgery and Nuclear Medicine, Avicenne Hospital, Bobigny: PHRC VOCALE and VOCALISE project.
DISTINCTIONS	
List of Awards for PI -Title -Date -Country	n/a
List of Awards for Team Members -Title -Date -Country	n/a

List of Promotions (CR1, DR1, etc.) for PI & Team members Only for CNRS, Inserm, Universities members - Name - Date - Grade	
List of Recruitments (new permanent CNRS, Inserm, Univ.) for Team members Only for CNRS, Inserm, Universities members - Name - Date - If Inserm, CNRS, Universities	
List of Researchers HDR for PI & Team members - Date obtained	1. Hervé Brisse, PH Curie 2. Irène Buvat, DR CNRS, 1998 3. Gilles Créhange, PUPH UVSQ, 4. Frédérique Frouin, CRHC Inserm, 5. Steven Le Gouill, PUPH UVSQ 6. Carole Thomas, CRCN Inserm, 2008 7. Fanny Orlhac, CRCN Inserm, 2024 8. Ludovic de Marzi, IR Curie, 2024
ON-GOING FUNDED PROJECTS & COLLABORATIONS	
NATIONAL - Individual projects Project Title Translational or not Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	1. NEMO-PET, translational, PI: Fanny Orlhac, funded by ANR JCJC, managed by Curie, 226 k€, 2022-2026. Abstracts (no full paper yet): - Auriac J, Droguet M, Sundar LKS, Seban RD, Luporsi M, Pires M, Nioche C, Beyer T, Bidard FC, Buvat I, Orlhac F. Prognostic stratification of metastatic triple-negative breast cancer patients using PET-radiomic features from malignant and tumor-free regions, SNMMI 2024 abstract, 65 Suppl : 241952. - Auriac J, Sundar LKS, Seban RD, Luporsi M, Nioche C, Beyer T, Buvat I, Orlhac F. MOOSE vs TotalSegmentator: Comparison of feature values of segmented anatomical regions in [18F]FDG PET/CT images. SNMMI 2024 abstract, 65 Suppl : 241948. 2. ARAMIS, translational, PI: Fanny Orlhac, funded by Cancéropôle Ile-de-France, managed by Curie, 40 k€, 2024-2025. No publication yet. 3. IRMomics, translational, coPI: F Frouin, funded by AP-HP Avicenne, 10 k€, 2024-2025. No publication yet.
INTERNATIONAL - Individual projects Project Title Translational or not Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	

INDUSTRIAL - Individual projects Project Title Translational or not Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	1. CIFRE grant of Louis Rebaud funded by Siemens Healthineers: Whole-body and total-body biomarkers in PET/CT imaging, translational. Contract managed by Curie, 73 k€ for Curie + 118 k€ for the PhD salary directly supported by Siemens, 2021-2024. <u>Publications:</u> - Durmo et al Hemat Oncol 2022, - Girum et al J Nucl Med 2022, and publications n° 26 and 27 this year (see Publication list). 2. CIFRE grant of Maria Grazia Ronga funded by Thales: Study of very high energy electron radiation therapy (VHEE). Contract managed by Curie, 79 k€ for Curie + 118 k€ for the PhD salary directly supported by Thales, 2021-2024. <u>Publications:</u> - Ronga et al Cancers 2021, - Deut et al Med Phys 2023, - Ronga et al Med Phys 2023, - Leite et al Phys Med 2023, and publications n°3 and 8 this year.
NATIONAL - Collaborative projects Project Title Translational or not PI role: PI Role: <i>Coord. or Part.</i> Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	1. PHRC-I FAP-IT, translational. PI: Romain-David Seban, funded by DGOS, managed by Curie Hospital, 429 k€ for Curie, 2023-2026. No publication yet. 2. PRT-K DEFI-LOC, translational. PI: Carole Soussain, funded by DGOS and INCA, managed by Curie Hospital, 389 k€ for Curie, 2023-2026. No publication yet. 3. PRT-K Federated-PET, translational. PI: Olivier Humbert, funded by DGOS and INCA, managed by CAL and Inria, 63k€ for LITO, 2023-2026. No publication yet. 4. Precision-Predict, translational, PI: Nicolas Girard, Co-PI in LITO: Irène Buvat and Fanny Orlhac (partners), funded by BPI France and Health Data Hub, managed by Curie, 300 k€ for Curie, 2020-2024. No publication yet. 5. TIPIT, translational, PI: Emmanuel Barillot, PI in LITO: Irène Buvat and Fanny Orlhac (partners), funded by Fondation Arc, managed by Curie, 600 k€ (~180 k€ for LITO), 2020-2026. <u>Publications: N° 1, 21 and 23.</u> 6. VOCALE, translational: Detection of recurrent nerve palsy using echography, PHRC-I PI C Trésallet, coPI Frédérique Frouin, managed by Inserm, 110 k€, 2019-2025. <u>Publication: N° 18.</u> 7. Retinoblastomics, translational Inter- and intratumoral heterogeneity of retinoblastomas, funded by Projet Ligue contre le cancer, PI F Radvanyi, coPI Irène Buvat, Hervé Brisse, managed by Curie, 49 k€, 2021-2026. No publication yet. 8. Indigo-Pancreas, translational: Cutting Edge Imaging for Earlier Pancreatic Cancer Diagnosis: evaluation of Positron Emission Tomography (PET) with the Fibroblast Activation Protein Inhibitor (FAPI), PI : Cindy Neuzillet, funded by ARC, 104 k€ for LITO, 2023-2027. No publication yet. 9. pMBRT : Radiothérapie par mini-faisceaux de protons : une nouvelle approche pour réduire les toxicités, PI : Yolanda Prezado, funded by INCA, 177 k€ for LITO, 2023-2027, <u>Publications: N° 5, 10, 17.</u>

	10. IMMUNOPancSIGN, translational, PI: Cindy Neuzillet, PI in LITO: Irène Buvat, funded by Fondation Arc, managed by Curie, 600 k€ (~86 k€ for LITO), 2024-2027. No publication yet. 11. MESSIDORE, translational, PI: Clémentine Sarkozy, funded by Inserm, managed by Curie, 1,451 k€ (~449 k€ for LITO), 2024-2027. No publication yet. 12. DIMADOSE, translational, PI: Caroline Lafond, funded by ANR, managed Curie, PI : Caroline Lafond, Centre Eugène Marquis, Rennes, PI Curie : Irène Buvat , 707 k€ (~238 k€ for LITO), 2025-2029. No publication yet. 13. BIDIFLY, translational, PI: Clémentine Sarkozy, funded by IFLI (USA), managed by Curie, 5,078 k€ (~517 k€ for LITO), 2023-2028. No publication yet. 14. Equipe-projet CNRS-Inserm AlphaBioDose. Modélisation Multi-Echelle En Radiothérapie Vectorisée α Des Métastases Cérébrales Précoces. PI : Rachel Delorme (CNRS) - Fanny Orlhac (Inserm), 69 k€ (15.5 k€ for LITO), 2024-2025. No publication yet.
INTERNATIONAL - Collaborative projects Project Title Translational or not PI role: PI Role: <i>Coord. or Part.</i> Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	1. Inter-Organ PET, translational, PI: Irène Buvat (LITO) and Thomas Beyer (Medical University of Vienna), funded by ANR PRCI, managed by Curie, 293 k€ for LITO, 2023-2026. Publications: not yet
INDUSTRIAL - Collaborative projects Project Title Translational or not PI role: PI Role: <i>Coord. or Part.</i> Funding source Managed by Curie, CNRS... Total Amount - k€ Period (start-end) Publications or Patents <i>Indicate the number in your list</i>	1. AI.DReAM, translational, PI: Baptiste Perrin GE Healthcare, PI Curie: Irène Buvat (partner), funded by BPI France, managed by Curie, 710 k€, 2020-2025. Publications: not yet. 2. RHU CASSIOPEIA, translational, PI: Fatima Mechta-Grigoriou Institut Curie, funded by ANR, managed by Curie, 9966 k€, 2022-2027. Publication: Peltier et al Semin Cancer Biol 2022. No publication in 2024. 3. VOCALISE, translational, PI: Frédérique Frouin, funded by ANR, managed by Curie, 160 k€ for LITO (499 k€ in total), 2022-2026. Publications: not yet. 4. Evaluation of new photosensitizers on TagRb transgenic mice developing retinoblastomas, translational, PI: Carole Thomas, funded by Retinostop 8k€ and Synthinnov 70 k€ including 10 k€ for LITO, 2024-2029. No publication yet.
Collaborations with the USA - <i>Researcher's name</i> - <i>Researcher's Institute</i> - <i>If she/he has publications, write the DOI</i>	1. Society of Nuclear Medicine and Molecular Imaging Artificial Intelligence Task Force (consortium) - doi: 10.2967/jnumed.121.262567 - doi: 10.2967/jnumed.121.263703 - doi: 10.2967/jnumed.121.263239
Other International collaborations	International group of lymphoma experts. Heiko Schöder - MSKCC New York, Sally Barrington - King's College London, Ronald Boellaard -VUMC Amsterdam, Luca Ceriani - Lugano, Luca Guerra – Milano, etc

Other French collaborations	Service de médecine nucléaire, Centre Hospitalier Princesse Grace, Monaco, Dr Florent Hugonnet
Other Highlight for the year	Preparation of the new project 2026-2030 “Imaging, Innovative Radiation Therapy and System Medicine” for HCERES evaluation
Comments	