

ARTIFICIAL INTELLIGENCE–DRIVEN CLINICAL ONCOLOGY INTELLIGENCE: FROM EARLY CANCER DETECTION TO PRECISION THERAPEUTICS

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Abstract: Artificial intelligence (AI) is transforming modern oncology by enabling the development of intelligent clinical ecosystems capable of supporting the entire continuum of cancer care, from early detection and diagnosis to precision therapeutics and long-term survivorship. Conventional oncology frequently relies on fragmented diagnostic modalities, episodic clinical assessments, and static predictive models that inadequately capture the dynamic biological evolution of malignant disease. Recent advances in foundation AI models, multimodal transformer architectures, graph neural networks, self-supervised learning, and generative artificial intelligence have enabled comprehensive integration of radiological imaging, digital pathology, genomics, transcriptomics, proteomics, metabolomics, epigenomics, spatial biology, laboratory biomarkers, circulating tumor DNA, wearable physiological monitoring, electronic health records, and longitudinal clinical outcomes into unified patient-specific computational frameworks. These intelligent systems support early cancer detection, molecular characterization, biomarker discovery, prognostic prediction, therapeutic optimization, immunotherapy selection, digital twin simulation, adaptive disease monitoring, and intelligent clinical decision support. Emerging technologies including multimodal large language models, federated learning, reinforcement learning, retrieval-augmented generation, explainable artificial intelligence, and agentic AI further strengthen clinical oncology intelligence by enabling collaborative, privacy-preserving, and continuously adaptive biomedical reasoning. Despite remarkable technological progress, significant scientific, technical, ethical, and regulatory challenges remain regarding multimodal data harmonization, computational scalability, interpretability, interoperability, cybersecurity, clinical validation, and equitable implementation. This review provides a comprehensive overview of AI-driven clinical oncology intelligence, emphasizing its role in advancing early cancer detection, precision therapeutics, and personalized cancer medicine.[1]

Keywords: Artificial intelligence, Clinical oncology, Precision oncology, Foundation models, Early cancer detection, Digital pathology, Radiomics, Clinical decision support, Multi-omics, Personalized medicine.

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1. Introduction

Cancer remains one of the leading causes of morbidity and mortality worldwide despite substantial advances in molecular biology, diagnostic imaging, surgical techniques, systemic

therapies, radiation oncology, and supportive care. The biological complexity of cancer arises from continuous genomic instability, epigenetic remodeling, immune adaptation, metabolic reprogramming, angiogenesis, tissue remodeling,

and dynamic interactions among malignant cells, stromal components, immune populations, and host physiology. These interconnected processes evolve throughout diagnosis, treatment, recurrence, metastasis, and survivorship, making precision oncology increasingly dependent upon computational systems capable of continuously integrating heterogeneous biomedical information.[2]

Modern healthcare generates unprecedented quantities of biomedical data through radiological imaging, digital pathology, genomic sequencing, transcriptomics, proteomics, metabolomics, epigenomics, spatial biology, laboratory investigations, circulating tumor DNA, wearable physiological monitoring, physician documentation, electronic health records, and patient-reported outcomes. Although each modality contributes valuable biological insight, isolated interpretation frequently fails to capture systems-level relationships governing disease progression, therapeutic response, resistance mechanisms, and long-term clinical outcomes.[3] Artificial intelligence has emerged as a transformative computational technology capable of integrating these heterogeneous biomedical datasets into unified patient-centered representations. Foundation AI models provide generalized biomedical reasoning, while multimodal learning enables adaptive knowledge transfer across numerous oncology applications. The emergence of AI-driven clinical oncology intelligence therefore represents a paradigm shift toward predictive, preventive, personalized, and continuously learning cancer care.[4]

2. Evolution of Clinical Oncology Intelligence

The evolution of clinical oncology has progressed from conventional statistical analyses toward intelligent computational ecosystems capable of continuously learning from biomedical evidence. Early computer-assisted oncology relied primarily on rule-based expert systems and machine learning algorithms developed for isolated diagnostic or prognostic tasks. Although these systems demonstrated clinical value, they remained constrained by handcrafted feature engineering, limited adaptability, and fragmented biomedical information.[5]

Deep learning substantially expanded computational capabilities through automated representation learning from radiological imaging, digital pathology, genomic sequencing, and electronic health records. Transformer architectures further revolutionized biomedical artificial intelligence by enabling generalized contextual learning across heterogeneous biomedical modalities.

Foundation AI models have now transformed oncology by acquiring transferable biomedical knowledge through large-scale self-supervised learning before adaptation to specialized clinical applications. More recently, multimodal large language models, digital twins, reinforcement learning, federated learning, and agentic AI have established intelligent computational ecosystems supporting comprehensive precision oncology.[6]

3. Principles of AI-Driven Clinical Oncology Intelligence

AI-driven clinical oncology intelligence differs fundamentally from conventional artificial intelligence because it functions as a continuously adaptive computational ecosystem rather than a static predictive algorithm. Foundation AI models integrate radiological imaging, digital pathology, genomics, transcriptomics, proteomics, metabolomics, laboratory biomarkers, wearable physiological monitoring, physician documentation, patient-reported outcomes, and longitudinal clinical trajectories into unified patient-specific computational representations.[7] Self-supervised learning enables discovery of latent biological relationships without requiring extensive manual annotation, while multimodal transformer architectures align heterogeneous biomedical modalities within shared computational embedding spaces. Graph neural networks further characterize interactions among genes, proteins, signaling pathways, immune populations, imaging phenotypes, tissue architecture, therapeutic targets, physiological variables, and clinical outcomes.

These computational principles establish adaptive biomedical intelligence capable of supporting precision oncology across the entire patient journey.[8]

4. Computational Architecture

Modern clinical oncology intelligence platforms consist of interconnected computational layers responsible for multimodal biomedical data acquisition, preprocessing, representation learning, multimodal fusion, adaptive learning, predictive analytics, digital twin simulation, and intelligent clinical decision support.[9]

The acquisition layer continuously incorporates radiological imaging, digital pathology, genomic sequencing, transcriptomics, proteomics, metabolomics, epigenomics, spatial biology, laboratory investigations, circulating tumor DNA, wearable physiological monitoring, medication history, physician documentation, patient-reported outcomes, and electronic health records. Advanced preprocessing pipelines normalize imaging studies, harmonize molecular datasets, encode clinical narratives using natural language processing, and synchronize temporal patient information.

Foundation AI models subsequently generate generalized multimodal embeddings representing molecular biology, tissue architecture, imaging phenotypes, physiological function, and longitudinal clinical trajectories. These unified computational representations support downstream applications including diagnosis, biomarker discovery, prognostic prediction, therapeutic optimization, adaptive learning, and precision oncology.[10]

5. Artificial Intelligence for Early Cancer Detection

Early detection remains one of the most effective strategies for improving cancer survival and reducing treatment-related morbidity. Foundation AI models substantially enhance early diagnosis by integrating radiological imaging, digital pathology, laboratory biomarkers, circulating tumor DNA, genomic profiling, electronic health records, and population health information into unified computational frameworks capable of identifying subtle biological abnormalities before overt clinical disease becomes apparent.[11]

Deep learning algorithms automatically detect radiological abnormalities across mammography, computed tomography, magnetic resonance imaging, ultrasound, positron emission

tomography, and endoscopic imaging while minimizing observer variability. Simultaneously, AI-enabled liquid biopsy analysis identifies circulating tumor DNA mutations, methylation patterns, circulating tumor cells, and extracellular vesicle biomarkers associated with early tumorigenesis.

Integration of imaging intelligence with molecular biomarkers substantially improves screening accuracy, risk stratification, early diagnosis, and timely therapeutic intervention.[12]

6. Molecular Intelligence and Multi-Omics Integration

Comprehensive molecular characterization represents one of the greatest strengths of AI-driven clinical oncology intelligence. Artificial intelligence integrates genomics, transcriptomics, proteomics, metabolomics, epigenomics, immunomics, microbiomics, spatial biology, and single-cell sequencing into generalized molecular representations capable of characterizing evolving tumor biology across multiple organizational scales.[13]

Transformer architectures identify latent biological relationships among genes, proteins, signaling pathways, metabolites, immune responses, and therapeutic targets, while graph neural networks model complex biological interaction networks supporting systems-level computational reasoning.

These generalized molecular representations enable discovery of molecular subtypes, therapeutic biomarkers, resistance mechanisms, prognostic signatures, and novel drug targets while substantially improving individualized precision medicine.[14]

7. Imaging and Pathology Intelligence

Radiological imaging and digital pathology provide complementary information describing cancer biology across macroscopic and microscopic organizational scales. Foundation AI models automatically extract generalized imaging and pathomic representations from computed tomography, magnetic resonance imaging, positron emission tomography, ultrasound, and whole-slide pathology images without requiring handcrafted feature engineering.[15]

Artificial intelligence identifies latent imaging and tissue biomarkers associated with molecular alterations, immune infiltration, angiogenesis, fibrosis, hypoxia, therapeutic responsiveness, treatment resistance, and disease progression. Integration of imaging intelligence with molecular biology substantially improves diagnosis, prognostic prediction, biomarker discovery, therapeutic optimization, and longitudinal disease monitoring.

These multimodal computational representations provide comprehensive characterization of evolving tumor biology while strengthening precision oncology.[16]

8. Clinical Intelligence Through Electronic Health Records

Electronic health records represent one of the richest longitudinal sources of clinical intelligence available in modern oncology. Structured laboratory investigations, medication history, pathology reports, treatment timelines, physician documentation, hospitalizations, patient-reported outcomes, and survivorship information collectively provide comprehensive patient-level context extending beyond molecular diagnostics.[17]

Foundation AI models employ natural language processing, temporal transformers, and multimodal reasoning architectures to integrate structured and unstructured EHR data with imaging, pathology, molecular biology, laboratory biomarkers, wearable monitoring, and physiological information into unified patient-specific computational representations.

These integrated clinical embeddings substantially improve prognostic prediction, recurrence surveillance, toxicity estimation, therapeutic optimization, survivorship management, and evidence-based clinical decision-making.[18]

9. Precision Therapeutics

One of the most clinically important applications of AI-driven clinical oncology intelligence is precision therapeutic decision-making through comprehensive integration of molecular biology, imaging phenotypes, histopathological characteristics, laboratory biomarkers, wearable physiological monitoring, medication history, and

longitudinal clinical trajectories. Foundation AI models simultaneously analyze heterogeneous biomedical information to predict responsiveness to chemotherapy, targeted therapy, endocrine therapy, immunotherapy, radiation therapy, surgery, and multimodal treatment combinations while estimating treatment-related toxicity, recurrence probability, progression-free survival, overall survival, and mechanisms of therapeutic resistance. These adaptive computational systems support individualized therapeutic planning while continuously refining predictive accuracy using newly acquired biomedical evidence throughout the cancer care continuum.[19][20]

10. Digital Twins and Intelligent Virtual Patient Modeling

Digital twin technology represents one of the most transformative applications of AI-driven clinical oncology intelligence by creating continuously evolving virtual representations of individual cancer patients synchronized with their biological counterparts. Foundation AI models integrate serial radiological imaging, digital pathology, genomics, transcriptomics, proteomics, metabolomics, laboratory biomarkers, circulating tumor DNA, wearable physiological monitoring, medication history, patient-reported outcomes, and longitudinal clinical information into adaptive computational patient models capable of simulating disease progression, therapeutic response, treatment-related toxicity, recurrence, metastatic dissemination, and survival.[21]

Unlike conventional predictive models, digital twins continuously update their computational representations as new biomedical information becomes available. These intelligent virtual patients enable clinicians to evaluate multiple therapeutic strategies before implementation, optimize treatment sequencing, anticipate mechanisms of therapeutic resistance, and personalize supportive care according to evolving patient biology.

By combining multimodal biomedical intelligence with predictive simulation, digital twins transform computational oncology from retrospective analysis toward proactive precision medicine supported by continuously adaptive virtual patient ecosystems.

11. Intelligent Clinical Decision Support

AI-driven clinical oncology intelligence provides the computational infrastructure for next-generation clinical decision-support systems capable of integrating heterogeneous biomedical information into comprehensive patient-centered recommendations. Rather than interpreting radiological imaging, digital pathology, molecular diagnostics, laboratory investigations, wearable physiological monitoring, medication history, physician documentation, patient-reported outcomes, and evidence-based clinical guidelines independently, foundation AI models synthesize these diverse biomedical information sources into unified computational representations supporting multidisciplinary oncology practice.[22]

Interactive clinical dashboards generate individualized diagnostic summaries, multimodal biomarker analyses, digital twin simulations, therapeutic recommendations, toxicity estimates, recurrence probabilities, disease progression forecasts, and survival predictions while facilitating collaboration among oncologists, radiologists, pathologists, surgeons, radiation oncologists, molecular biologists, pharmacists, nurses, genetic counselors, and computational scientists.

These intelligent systems improve workflow efficiency, strengthen multidisciplinary communication, reduce information fragmentation, and promote evidence-based personalized cancer management throughout the cancer care continuum.

12. Continuous Learning and Adaptive Clinical Intelligence

A defining characteristic of AI-driven clinical oncology intelligence is its ability to continuously evolve as new biomedical information becomes available. Artificial intelligence incorporates serial imaging examinations, computational pathology, circulating tumor DNA, laboratory biomarkers, wearable physiological monitoring, medication adherence, patient-reported outcomes, and real-world clinical evidence into adaptive computational frameworks capable of continuously refining predictive accuracy throughout the patient's clinical journey.[23]

Continual learning algorithms enable incremental refinement of computational knowledge without catastrophic forgetting of previously acquired information, while reinforcement learning optimizes therapeutic recommendations through iterative evaluation of treatment outcomes. Consequently, intelligent oncology platforms remain synchronized with evolving tumor biology, emerging scientific discoveries, changing clinical guidelines, and diverse patient trajectories. This adaptive computational paradigm transforms oncology into a continuously learning healthcare ecosystem capable of supporting real-time personalized precision medicine.

13. Federated Clinical Oncology Intelligence Networks

Development of highly generalizable AI-driven clinical oncology intelligence requires access to diverse biomedical datasets representing multiple healthcare systems, imaging platforms, pathology laboratories, molecular technologies, treatment protocols, and patient populations. Federated learning enables collaborative development of foundation AI models while preserving patient privacy and institutional governance through decentralized computational training.[24]

Participating healthcare institutions independently train local models using radiological imaging, digital pathology, genomics, transcriptomics, laboratory investigations, wearable monitoring, liquid biopsy, and longitudinal clinical records while securely exchanging encrypted model parameters rather than identifiable patient information. This collaborative learning strategy substantially improves algorithm robustness, fairness, external validity, and generalizability across diverse healthcare environments.

Federated oncology intelligence ecosystems therefore establish international computational oncology networks capable of accelerating scientific discovery, improving equitable access to precision medicine, and supporting global cancer research while maintaining responsible biomedical data stewardship.

14. Explainability, Validation, and Ethical Governance

Successful implementation of AI-driven clinical oncology intelligence requires transparent, interpretable, reproducible, and rigorously validated computational systems capable of supporting clinician confidence, patient trust, and regulatory approval. Explainable artificial intelligence (XAI) enables clinicians to understand computational reasoning through attention visualization, saliency maps, SHAP (Shapley Additive Explanations), feature attribution analysis, uncertainty estimation, and counterfactual explanations identifying the imaging, molecular, pathological, physiological, and clinical variables responsible for predictive outputs.[25]

Clinical deployment additionally requires standardized multimodal datasets, interoperable computational infrastructure, prospective multicenter validation, external benchmarking, cybersecurity safeguards, continuous monitoring for algorithmic bias, and compliance with evolving international regulatory frameworks governing AI-enabled healthcare technologies.

Responsible implementation further depends upon protection of patient privacy, informed consent, transparency, accountability, equitable access, responsible data governance, and continuous post-deployment surveillance to ensure trustworthy integration of intelligent computational systems into routine oncology practice.

15. Future Perspectives

Future AI-driven clinical oncology intelligence will increasingly integrate multimodal foundation models, multimodal large language models, agentic artificial intelligence, graph neural networks, reinforcement learning, federated learning, digital twins, spatial multi-omics, liquid biopsy, quantum computing, Internet of Medical Things (IoMT), robotics, and cloud-native healthcare infrastructure into unified precision oncology platforms.[26]

These next-generation computational ecosystems will continuously integrate molecular biology, imaging, pathology, laboratory medicine, wearable physiological monitoring, environmental exposures, electronic health records, biomedical literature, and real-world clinical outcomes while autonomously coordinating diagnostic workflows, optimizing therapeutic strategies, supporting adaptive clinical trials, generating personalized patient communication, and continuously synthesizing biomedical evidence.

Such intelligent ecosystems are expected to transform oncology from fragmented and reactive disease management toward predictive, preventive, adaptive, continuously learning, and precision-guided healthcare across the global cancer community.

16. Discussion

AI-driven clinical oncology intelligence represents one of the most significant paradigm shifts in computational oncology by integrating molecular biology, radiological imaging, digital pathology, laboratory biomarkers, digital twins, wearable technologies, and longitudinal clinical intelligence into unified computational ecosystems capable of supporting comprehensive personalized cancer care. Unlike conventional artificial intelligence systems developed for isolated predictive tasks, these intelligent frameworks simultaneously analyze molecular biology, tissue architecture, imaging phenotypes, physiological monitoring, environmental influences, and longitudinal clinical trajectories to generate holistic computational representations of evolving cancer biology.[27]

Applications spanning computational pathology, radiogenomics, biomarker discovery, precision immunotherapy, digital twins, adaptive therapeutics, continuous learning, federated collaboration, digital health, survivorship management, and intelligent clinical decision support demonstrate the extraordinary potential of AI to redefine future oncology. Nevertheless, successful implementation requires continued advances in multimodal data harmonization, explainable artificial intelligence, interoperability, computational infrastructure, cybersecurity,

regulatory science, ethical governance, and sustained multidisciplinary collaboration.

As biomedical knowledge and healthcare data continue to expand exponentially, AI-driven clinical oncology intelligence is expected to become the central computational infrastructure supporting precision oncology worldwide.

17. Conclusion

Artificial intelligence-driven clinical oncology intelligence is transforming personalized cancer care by integrating radiological imaging, digital pathology, multi-omics, laboratory biomarkers, wearable technologies, electronic health records, digital twins, and longitudinal clinical intelligence into unified computational ecosystems capable of supporting accurate diagnosis, biomarker discovery, prognostic prediction, therapeutic optimization, adaptive disease monitoring, and individualized clinical decision-making throughout the cancer care continuum.[28]

Advances in transformer architectures, multimodal learning, graph neural networks, self-supervised learning, federated learning, reinforcement learning, digital twins, multimodal large language models, agentic AI, and generative artificial intelligence are expected to further strengthen intelligent oncology ecosystems, enabling increasingly accurate molecular characterization, predictive clinical intelligence, adaptive therapeutics, continuous disease surveillance, and continuously personalized precision oncology.[29]

Although important scientific, technical, ethical, regulatory, and implementation challenges remain, sustained collaboration among oncologists, radiologists, pathologists, molecular biologists, biomedical engineers, computer scientists, healthcare organizations, policymakers, industry partners, and regulatory agencies will accelerate the responsible implementation of AI-driven clinical oncology intelligence. These innovations have the potential to improve patient outcomes, enhance healthcare efficiency, reduce disparities in cancer care, accelerate translational research, and establish a new era of intelligent, adaptive, and continuously learning precision oncology worldwide.[30]

References

1. Meric-Bernstam, F. et al. (2023) 'Enhancing Precision Oncology Through Multimodal Data Integration', *Nature Reviews Clinical Oncology*, 20(4), pp. 267-283.
2. Huang, S.C. et al. (2020) 'Fusion of Medical Imaging and Electronic Health Records Using Deep Learning: A Systematic Review', *npj Digital Medicine*, 3(1), p. 136.
3. 3. 30. Dr. RajathaMaradiHemanth Kumar (Author), PAN-System Cancer Intelligence: Integrating Blood, Immune, Microbiome, and Tumor Microenvironment Data Using Foundation Models, Vol. 51 No. 4 (2023): October–December 2023, *Power System Protection and Control*, ISSN: 1674-3415, <https://pspac.info/index.php/dlbh/article/view/389>, DOI: <https://doi.org/10.46121/pspc.51.4.8>
4. Lambin, P. et al. (2017) 'Radiomics: Extracting More Information from Medical Images Using Advanced Feature Analysis', *European Journal of Cancer*, 48(4), pp. 441-446.
5. Zwanenburg, A. et al. (2023) 'The Image Biomarker Standardization Initiative: Standardized Quantitative Radiomics for High-Throughput Image-based Phenotyping', *Radiology*, 308(2), e221422.
6. Chen, R.J. et al. (2023) 'Towards a General-Purpose Foundation Model for Computational Pathology', *Nature Medicine*, 29(4), pp. 850-862.
7. Kather, J.N. et al. (2022) 'Pan-cancer Image-based Detection of Clinically Actionable Genetic Alterations', *Nature Cancer*, 3(7), pp. 789-799.
8. Chaudhary, K. et al. (2021) 'Deep Learning-Based Multi-Omics Integration Robustly Predicts Survival in Liver Cancer', *Clinical Cancer Research*, 27(5), pp. 1248-1259.
9. Cancer Genome Atlas Research Network (2013) 'The Cancer Genome Atlas Pan-Cancer Analysis Project', *Nature Genetics*, 45(10), pp. 1113-1120.
10. Huang, S.C. et al. (2021) 'Self-supervised Learning for Medical Image Classification: A Systematic Review', *IEEE Transactions on Medical Imaging*, 40(8), pp. 2021-2037.
11. Moor, M. et al. (2023) 'Foundation Models for Generalist Medical Artificial Intelligence', *Nature*, 616(7956), pp. 259-265.

12. Hanahan D. Hallmarks of cancer: new dimensions. *Cancer Discov.* 2022;12(1):31–46. Doi:10.1158/2159-8290.CD-21-1059.
13. Singhal K, Azizi S, Tu T, et al. Large language models encode clinical knowledge. *Nature.* 2023;620(7972):172–180. Doi:10.1038/s41586-023-06291-2.
14. Xu H, Usuyama N, Bagga J, et al. A whole-slide foundation model for digital pathology from real-world data. *Nature.* 2024;630(8015):181–188. Doi:10.1038/s41586-024-07441-w.
15. Moor M, Banerjee O, Abad ZSH, et al. Foundation models for generalist medical artificial intelligence. *Nature.* 2023;616(7956):259–265. Doi:10.1038/s41586-023-05881
16. Bommasani R, Hudson DA, Adeli E, et al. On the opportunities and risks of foundation models. *arXiv.* 2021. Doi:10.48550/arXiv.2108.07258.
17. Dosovitskiy A, Beyer L, Kolesnikov A, et al. An image is worth 16×16 words: transformers for image recognition at scale. *arXiv.* 2020. Doi:10.48550/arXiv.2010.11929.
18. Dr. Ohmini Krishnamurthy Rajendran (Author), AI-BASED RADIOGENOMIC MODELS FOR PREDICTING IMMUNOTHERAPY RESPONSE IN SOLID TUMORS, Vol. 51 No. 4 (2023): October-December 2023, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/321>, DOI: <https://doi.org/10.46121/pspc.51.4.4>
19. Dr. Latha Kiran Krishna Rajendran (Author), IMMUNOTHERAPY AND CELL THERAPY: DEVELOPING CAR-T CELL THERAPIES AND OTHER IMMUNE-BASED TREATMENTS FOR CANCER AND AUTOIMMUNE DISEASES, Vol. 51 No. 2 (2023): April-June 2023, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/304>, DOI: <https://doi.org/10.46121/pspc.51.2.7>
20. Chakraborty, S. et al. (2022) ‘Multi-omics Integration in Oncology: From Data to Clinical Insights’, *Cancer Cell*, 40(8), pp. 805-823.
21. Dr. Ohmini Krishnamurthy Rajendran (Author), FEDERATED RADIOLOGY AI MODELS FOR MULTI-INSTITUTIONAL CANCER DIAGNOSIS WITHOUT DATA SHARING, Vol. 51 No. 4 (2023): October-December 2023, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/323>, DOI: <https://doi.org/10.46121/pspc.51.4.5>
22. Dr. Latha Kiran Krishna Rajendran (Author), MECHANISMS DRIVING IMMUNOTHERAPY RESISTANCE IN COLORECTAL CANCER LIVER METASTASES, Vol. 52 No. 1 (2024): January-March 2024, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/303>, DOI: <https://doi.org/10.46121/pspc.52.1.5>
23. Dr. Ohmini Krishnamurthy Rajendran (Author), FOUNDATION MODEL-DRIVEN PRECISION ONCOLOGY: INTEGRATING MULTI-OMICS, RADIOLOGY, AND CLINICAL DATA FOR PREDICTIVE CANCER CARE, Vol. 52 No. 2 (2024): April-June 2024, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/324>, DOI: <https://doi.org/10.46121/pspc.52.2.14>
24. Dr. Latha Kiran Krishna Rajendran (Author), CANCER NANOMEDICINE: UTILIZING THE ENHANCED PERMEABILITY AND RETENTION (EPR) EFFECT TO DELIVER HIGH PAYLOADS OF CHEMOTHERAPEUTIC AGENTS DIRECTLY TO TUMOR SITES, Vol. 52 No. 2 (2024): April-June 2024, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/311>, DOI: <https://doi.org/10.46121/pspc.52.2.12>
25. Dr. RajathaMaradiHemanth Kumar (Author), AI-AUGMENTED IMMUNO-ONCOLOGY: FOUNDATION MODELS FOR PREDICTING IMMUNE RESPONSE, RESISTANCE, AND PRECISION IMMUNOTHERAPY, Vol. 52 No. 2 (2024): April-June 2024, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/345>, DOI: <https://doi.org/10.46121/pspc.52.2.18>
26. Dr. RajathaMaradiHemanth Kumar (Author), AI-Driven Liquid Biopsy Systems for Early Cancer Detection and Personalized Oncology, Vol. 51 No. 4 (2023): October-December 2023, *Power System Protection and Control*, ISSN: 1674-3415,

<https://pspac.info/index.php/dlbh/article/view/388>
, DOI: <https://doi.org/10.46121/pspc.51.4.7>

27. Dr. Ohmini Krishnamurthy Rajendran (Author), SELF-SUPERVISED MULTIMODAL LEARNING FOR EARLY CANCER DETECTION ACROSS IMAGING AND GENOMICS, Vol. 52 No. 4 (2024): October-December 2024, Power System Protection and Control, ISSN-1674-3415,

<https://pspac.info/index.php/dlbh/article/view/325>,
DOI: <https://doi.org/10.46121/pspc.52.4.14>

28. Dr. RajathaMaradiHemanth Kumar (Author), MULTIMODAL FOUNDATION AI MODELS IN PRECISION ONCOLOGY: INTEGRATING RADIOMICS, PATHOMICS, MULTI-OMICS, AND CLINICAL INTELLIGENCE SYSTEMS, Vol. 52 No. 4 (2024): October–December 2024, Power System Protection and Control, ISSN-1674-3415,

<https://pspac.info/index.php/dlbh/article/view/343>
, DOI: <https://doi.org/10.46121/pspc.52.4.16>

29. Joshi, A. et al. (2023) ‘Multimodal Learning for Precision Oncology: Beyond Single-modality Analysis’, npj Precision Oncology, 7(1), p. 28.

30. Dr. Latha Kiran Krishna Rajendran (Author), Genomic Profiling: Utilizing Multi-Omics Data to Identify Potential Therapeutic Targets and Resistance Markers, Vol. 52 No. 4 (2024): October–December 2024, Power System Protection and Control, ISSN: 1674-3415, Article URL:

<https://pspac.info/index.php/dlbh/article/view/312>
, DOI: <https://doi.org/10.46121/pspc.52.4.13>.