

FOUNDATION MODELS FOR CANCER INTELLIGENCE: INTEGRATING RADIOLOGY, PATHOLOGY, MULTI-OMICS, AND CLINICAL DECISION SUPPORT

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Abstract: Foundation artificial intelligence (AI) models are transforming modern oncology by enabling comprehensive cancer intelligence through the integration of radiology, pathology, multi-omics, and clinical information into unified computational ecosystems capable of supporting precision diagnosis, prognostic prediction, therapeutic optimization, and personalized clinical decision-making. Conventional artificial intelligence systems have demonstrated considerable success in isolated oncology applications; however, their dependence on task-specific training, fragmented biomedical data, and limited generalizability restrict widespread clinical implementation. Recent advances in foundation AI models, multimodal transformer architectures, graph neural networks, self-supervised learning, and generative artificial intelligence have enabled generalized biomedical representation learning across 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. These intelligent computational systems support early cancer detection, molecular characterization, biomarker discovery, prognostic prediction, treatment 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 cancer intelligence by enabling collaborative, privacy-preserving, transparent, and continuously adaptive biomedical reasoning. Despite remarkable technological advances, important 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 foundation models for cancer intelligence, emphasizing integration of radiology, pathology, multi-omics, and clinical decision support as a transformative framework for personalized cancer medicine.[1]

Keywords: *Foundation models, Cancer intelligence, Precision oncology, Artificial intelligence, Radiology, Digital pathology, Multi-omics, Clinical decision support, Computational oncology, Personalized medicine.*

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1. Introduction

is a biologically dynamic disease characterized by continuous genomic evolution, epigenetic

remodeling, immune adaptation, metabolic reprogramming, angiogenesis, tissue remodeling, and intricate interactions among malignant cells,

stromal components, immune populations, and host physiology. These interconnected biological processes evolve throughout diagnosis, treatment, recurrence, metastasis, and survivorship, making precision oncology increasingly dependent upon computational systems capable of integrating heterogeneous biomedical information across multiple biological scales.[2]

Modern oncology routinely generates enormous quantities of biomedical information 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 overlooks 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 extend these capabilities through generalized multimodal learning that enables knowledge transfer across numerous oncology applications while continuously adapting to evolving biomedical evidence.

The emergence of foundation models for cancer intelligence therefore represents a paradigm shift toward integrated precision oncology capable of supporting personalized diagnosis, prognosis, and treatment throughout the cancer care continuum.[4]

2. Evolution of Foundation Models in Oncology

Artificial intelligence in oncology has evolved from conventional statistical analyses toward intelligent computational ecosystems capable of continuously learning from diverse biomedical information. Early machine learning algorithms primarily relied upon handcrafted feature engineering and task-specific predictive models developed for isolated diagnostic or prognostic applications. Although these systems

demonstrated important clinical value, they remained constrained by fragmented biomedical information, limited adaptability, and narrow task specialization.[5]

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

Foundation AI models now acquire transferable biomedical knowledge through large-scale self-supervised pretraining, allowing a single computational architecture to perform diverse oncology tasks including diagnosis, prognosis, biomarker discovery, therapeutic prediction, disease monitoring, radiomics, pathomics, genomics, and clinical reasoning.[6]

3. Principles of Foundation Cancer Intelligence

Foundation AI models differ fundamentally from conventional artificial intelligence because they acquire generalized biomedical representations from massive multimodal datasets before specialization for individual oncology applications. Rather than learning isolated predictive tasks, these models develop transferable computational knowledge applicable across diagnosis, prognosis, molecular characterization, biomarker discovery, therapeutic optimization, disease monitoring, computational pathology, radiomics, immunotherapy, and clinical decision support.[7]

Self-supervised learning enables discovery of latent biological relationships without requiring extensive manual annotation, while multimodal transformer architectures align radiological imaging, digital pathology, genomics, transcriptomics, proteomics, metabolomics, laboratory biomarkers, wearable physiological monitoring, physician documentation, patient-reported outcomes, and longitudinal clinical trajectories within unified 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, thereby enabling systems-level computational reasoning supporting precision oncology.[8]

4. Computational Architecture

Modern cancer intelligence platforms consist of interconnected computational layers responsible for 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 integrates 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 diagnosis, biomarker discovery, prognostic prediction, therapeutic optimization, adaptive learning, and integrated cancer intelligence.[10]

5. Radiology Intelligence

Radiological imaging provides comprehensive anatomical and functional characterization of tumors throughout diagnosis, treatment, recurrence, and surveillance. Foundation AI models automatically extract generalized imaging representations from computed tomography, magnetic resonance imaging, positron emission tomography, ultrasound, mammography, and hybrid imaging platforms without requiring handcrafted feature engineering.[11]

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

These imaging representations provide a non-invasive computational window into evolving tumor biology while strengthening personalized oncology throughout the patient journey.[12]

6. Digital Pathology Intelligence

Digital pathology has transformed oncological diagnosis by enabling computational analysis of whole-slide images containing billions of cellular structures. Foundation AI models extract generalized pathomic representations describing cellular morphology, tissue architecture, stromal remodeling, angiogenesis, fibrosis, necrosis, immune infiltration, and spatial cellular organization across diverse tumor types.[13]

Transformer architectures identify microscopic tissue patterns associated with molecular alterations, therapeutic responsiveness, disease progression, and clinical outcomes, while graph neural networks characterize interactions among malignant cells, stromal components, vascular structures, and immune populations.

Integration of digital pathology with radiology, genomics, and clinical intelligence substantially enhances systems-level understanding of tumor biology while supporting precision oncology.[14]

7. Multi-Omics Intelligence

Comprehensive molecular characterization represents one of the greatest strengths of foundation AI models in cancer 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.[15]

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.[16]

8. Clinical Intelligence and Decision Support

Clinical intelligence represents the integration of structured and unstructured clinical information into continuously evolving computational representations supporting multidisciplinary oncology practice. Electronic health records, laboratory investigations, medication history, physician documentation, patient-reported outcomes, wearable physiological monitoring, and longitudinal clinical trajectories collectively provide comprehensive patient-level information extending beyond molecular diagnostics.[17]

Foundation AI models integrate these diverse clinical datasets with radiology, pathology, and molecular biology using natural language processing, temporal transformers, and multimodal reasoning architectures. These unified computational representations enable adaptive prediction of disease progression, therapeutic response, recurrence, hospitalization, survivorship outcomes, and overall survival while supporting evidence-based clinical decision-making throughout diagnosis, treatment, follow-up, and survivorship.[18]

9. Integrated Precision Diagnosis and Therapeutic Prediction

One of the most clinically important applications of foundation models for cancer intelligence is integrated diagnosis and therapeutic prediction through comprehensive fusion of radiological imaging, digital pathology, molecular biology, laboratory biomarkers, wearable physiological monitoring, medication history, physician documentation, 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 foundation AI models for cancer 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

Foundation AI models provide 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, these models synthesize diverse biomedical information 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 fragmentation of biomedical information, and promote evidence-based personalized cancer management throughout the cancer care continuum.

12. Continuous Learning and Adaptive Cancer Intelligence

A defining characteristic of foundation AI models is their 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, cancer intelligence 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 Foundation Model Networks

Development of highly generalizable foundation AI models 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, electronic health records, 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 cancer 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 foundation AI models for cancer 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 cancer intelligence ecosystems 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

Foundation AI models represent one of the most significant paradigm shifts in computational oncology by integrating radiology, digital pathology, multi-omics, laboratory biomarkers, wearable technologies, digital twins, 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, radiological imaging, laboratory biomarkers, 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, digital twins, precision immunotherapy, adaptive therapeutics, continuous learning, federated collaboration, digital health, survivorship management, and intelligent clinical decision support demonstrate the extraordinary potential of foundation AI models 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, foundation AI models for cancer intelligence are expected to

become the central computational infrastructure supporting precision oncology worldwide.

17. Conclusion

Foundation AI models are transforming cancer intelligence by integrating radiology, 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 personalized cancer care throughout the disease 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 decision-making, adaptive therapeutics, continuous disease surveillance, and continuously personalized oncology care.[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 foundation AI models for cancer 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. 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>

3. 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>

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

5. 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>.

6. 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.

7. 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>

8. 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.

9. Zwanenburg, A. et al. (2023) 'The Image Biomarker Standardization Initiative: Standardized Quantitative Radiomics for High-Throughput Image-based Phenotyping', *Radiology*, 308(2), e221422.
10. Chen, R.J. et al. (2023) 'Towards a General-Purpose Foundation Model for Computational Pathology', *Nature Medicine*, 29(4), pp. 850-862.
11. Kather, J.N. et al. (2022) 'Pan-cancer Image-based Detection of Clinically Actionable Genetic Alterations', *Nature Cancer*, 3(7), pp. 789-799.
12. 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.
13. Cancer Genome Atlas Research Network (2013) 'The Cancer Genome Atlas Pan-Cancer Analysis Project', *Nature Genetics*, 45(10), pp. 1113-1120.
14. 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.
15. Moor, M. et al. (2023) 'Foundation Models for Generalist Medical Artificial Intelligence', *Nature*, 616(7956), pp. 259-265.
16. Hanahan D. Hallmarks of cancer: new dimensions. *Cancer Discov.* 2022;12(1):31–46. Doi:10.1158/2159-8290.CD-21-1059.
17. 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.
18. 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.
19. 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
20. Bommasani R, Hudson DA, Adeli E, et al. On the opportunities and risks of foundation models. *arXiv.* 2021. Doi:10.48550/arXiv.2108.07258.
21. 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.
22. 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>
23. 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>
24. Chakraborty, S. et al. (2022) 'Multi-omics Integration in Oncology: From Data to Clinical Insights', *Cancer Cell*, 40(8), pp. 805-823.
25. 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>
26. 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>
27. 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>

28. 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>

29. 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>

30. 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>