AI-Assisted Precision Medicine for Breast Cancer: Current Advances and Future Perspectives

[1]Dr. Sangeeta Kulshreshtha, [2]Dr. Pranav Iqbal, [3]Mrs. Divya Ramesh, [4]Dr. Joseph Mathew, [5]Dr. Kavitha Mohan, [6]Mr. Rohit Das, [7]Dr. Anil George

*[*1]Professor Department of Medical Oncology, Christian Medical College, Vellore, India Sangeeta.kul@gmail.com*
[2] Associate Professor Department of Pathology, Christian Medical College, Vellore, India Pranaviqbal1987@gmail.com
[3]Assistant Professor Department of Pharmacology, Christian Medical College, Vellore, India Divya.ramesh41@gmail.com
[4]Professor Department of Internal Medicine, Christian Medical College, Vellore, India Jmathew.med@gmail.com
[5]Associate Professor Department of Community Medicine, Christian Medical College, Vellore, India Kavithamohan73@gmail.com
[6]Assistant Professor Department of Clinical Research, Christian Medical College, Vellore, India Rohitdas1989@gmail.com
[7]Professor Department of Radiology, Christian Medical College, Vellore, India Anilgeorge55@gmail.com

ABSTRACT:

Breast cancer remains the most commonly diagnosed malignancy among women worldwide and continues to be a major contributor to cancer-related morbidity and mortality despite remarkable advances in screening, molecular diagnostics, targeted therapy, and precision medicine. The remarkable biological heterogeneity of breast cancer, characterized by diverse molecular subtypes, genomic alterations, tumor microenvironment interactions, and variable therapeutic responses, necessitates increasingly individualized treatment strategies. Artificial intelligence (AI) has emerged as a transformative technology in precision breast oncology by enabling comprehensive analysis of radiological imaging, digital pathology, genomic sequencing, transcriptomics, proteomics, laboratory biomarkers, electronic health records, and real-world clinical data. Machine learning, deep learning, natural language processing, computer vision, multimodal learning, graph neural networks, and foundation models have significantly improved breast cancer screening, diagnosis, molecular classification, prognostic prediction, therapeutic optimization, radiogenomics, computational pathology, and clinical decision support. AI-assisted precision medicine further facilitates personalized treatment selection, adaptive therapeutic monitoring, drug discovery, survivorship care, and long-term outcome prediction. Emerging innovations including explainable artificial intelligence, digital twins, federated learning, liquid biopsy, single-cell sequencing, wearable technologies, and generative AI are expected to further transform individualized breast cancer management. Despite substantial progress, important challenges remain regarding data harmonization, interoperability, transparency, algorithmic bias, cybersecurity, regulatory approval, and equitable implementation. This review discusses the current landscape of AI-assisted precision medicine in breast cancer, highlighting technological advances, clinical applications, implementation challenges, and future perspectives for personalized oncology.[1]

Keywords: Artificial intelligence, Precision medicine, Breast cancer, Machine learning, Deep learning, Genomics, Digital pathology, Radiogenomics, Personalized therapeutics, Clinical decision support.

Received Date: 5 December 2025; **Accepted Date:** 15 December 2025; **Published Date:** 20 December 2025

I. Introduction

Breast cancer is one of the most biologically diverse malignancies, encompassing multiple molecular subtypes with distinct genomic alterations, signaling pathways, therapeutic sensitivities, and clinical outcomes. Although significant advances in screening programs, molecular diagnostics, endocrine therapy, HER2-targeted agents, immunotherapy, and precision medicine have improved survival, considerable variability in treatment response and long-term prognosis continues to challenge clinicians worldwide.[2]

Precision medicine has fundamentally changed breast oncology by shifting treatment decisions from traditional clinicopathological classification toward individualized therapeutic strategies based on molecular characteristics. Modern breast cancer management generates enormous quantities of biomedical information through mammography, breast ultrasound, magnetic resonance imaging, digital pathology, genomic sequencing, transcriptomics, proteomics, laboratory investigations, wearable devices, and electronic health records. However, interpreting these multidimensional datasets frequently exceeds the capabilities of conventional analytical approaches and routine clinical workflows.[3]

Artificial intelligence has emerged as one of the most influential technologies in modern breast oncology by enabling automated interpretation of complex biomedical information. AI algorithms identify subtle imaging abnormalities, classify molecular subtypes, predict therapeutic response, estimate recurrence risk, and assist clinicians in evidence-based treatment planning through continuous learning from large-scale clinical datasets.[4]

The integration of artificial intelligence with precision medicine is redefining breast cancer management by enabling predictive, personalized, adaptive, and data-driven clinical care tailored to the biological characteristics of individual tumors.[5]

2. Evolution of AI-Assisted Precision Breast Oncology

Historically, breast cancer treatment relied primarily on tumor size, histological grade, lymph node status, and hormone receptor expression to guide therapeutic decisions. Although these clinical variables remain fundamental, they often fail to explain the considerable biological heterogeneity observed among patients with apparently similar diagnoses.[6]

The introduction of next-generation sequencing and molecular profiling revolutionized breast oncology by enabling identification of clinically actionable genomic alterations involving genes such as BRCA1, BRCA2, PIK3CA, TP53, and PALB2. Molecular classification into luminal A, luminal B, HER2-enriched, and triple-negative breast cancer further improved individualized treatment planning and prognostic prediction.[7]

Artificial intelligence has expanded these advances by integrating imaging, pathology, genomics, transcriptomics, proteomics, and clinical information into unified computational models. Machine learning, deep learning, multimodal learning, transformer architectures, and foundation models now support comprehensive characterization of tumor biology while facilitating increasingly personalized therapeutic strategies.[8]

Modern precision breast oncology therefore extends beyond genomic analysis alone, incorporating multidimensional biological information that enables more accurate diagnosis, individualized treatment selection, and improved long-term patient outcomes.[9]

3. Artificial Intelligence Technologies Supporting Precision Medicine

Multiple complementary artificial intelligence technologies collectively support precision breast oncology. Machine learning algorithms identify nonlinear relationships among clinical variables and patient outcomes, enabling prediction of diagnosis, recurrence, treatment response, toxicity, and survival.[10]

Deep learning substantially enhances diagnostic performance through automated extraction of hierarchical features from mammography, breast ultrasound, magnetic resonance imaging, digital pathology, and genomic datasets. Convolutional neural networks excel in image analysis, whereas transformer architectures efficiently integrate heterogeneous multimodal biomedical information.

Natural language processing extracts clinically relevant information from pathology reports, radiology reports, physician documentation, multidisciplinary meeting summaries, and electronic health records. Graph neural networks further model biological interactions involving genes, proteins, signaling pathways, immune networks, and therapeutic targets, enabling systems-level understanding of breast cancer biology.

Together, these computational approaches provide comprehensive patient-specific representations that facilitate evidence-based clinical decision-making throughout the breast cancer care continuum.[11]

4. Genomics and Molecular Characterization

Genomic medicine forms the foundation of precision breast oncology by identifying inherited susceptibility variants and somatic genomic alterations that influence tumor development, therapeutic sensitivity, and long-term clinical outcomes. High-throughput sequencing technologies enable comprehensive analysis of mutations, copy-number alterations, structural rearrangements, and gene-expression signatures associated with breast cancer progression.[12]

Artificial intelligence significantly improves genomic interpretation by prioritizing clinically actionable variants, predicting functional consequences of mutations, identifying resistance mechanisms, and estimating therapeutic sensitivity. Machine learning algorithms integrate genomic information with transcriptomics, proteomics, pathology, imaging, and clinical outcomes to generate comprehensive precision medicine recommendations.

Transcriptomic profiling further enhances molecular characterization by identifying gene-expression patterns associated with endocrine responsiveness, chemotherapy sensitivity, recurrence risk, and intrinsic molecular subtypes, providing additional biological insight beyond genomic alterations alone.[13]

DOI: https://doi.org/10.62896/ijmdas.2025.V1.I6.07

5. Artificial Intelligence in Breast Cancer Screening and Early Diagnosis

Early detection remains one of the most effective strategies for improving breast cancer survival. Artificial intelligence has substantially enhanced mammographic screening through automated identification of suspicious lesions, microcalcifications, architectural distortion, focal asymmetry, and interval changes across digital mammography and digital breast tomosynthesis.[14]

Deep learning algorithms improve sensitivity while reducing false-negative interpretations and assisting radiologists in prioritizing high-risk examinations. AI also supports individualized screening by integrating imaging findings with family history, breast density, genetic susceptibility, hormonal factors, demographic characteristics, and lifestyle variables to estimate personalized breast cancer risk.

These intelligent screening strategies facilitate earlier diagnosis, improve healthcare efficiency, and reduce unnecessary diagnostic procedures while supporting personalized preventive medicine.[15]

6. Advanced Breast Imaging and Radiomics

Artificial intelligence has transformed breast imaging by enabling automated interpretation of mammography, ultrasound, magnetic resonance imaging, contrast-enhanced mammography, and molecular breast imaging. Deep learning algorithms accurately detect tumors, segment lesions, estimate tumor burden, evaluate vascularity, and monitor therapeutic response throughout treatment.[16]

Radiomics further extends imaging capabilities by extracting hundreds of quantitative imaging biomarkers describing tumor morphology, texture, vascularity, heterogeneity, and spatial organization. AI integrates these radiomic features with pathological and molecular information to improve diagnosis, prognostic prediction, therapeutic planning, and disease monitoring.

Longitudinal imaging analysis allows continuous evaluation of treatment response, facilitating earlier detection of residual disease, recurrence, or therapeutic resistance while supporting adaptive clinical management.[17]

7. Digital Pathology and Computational Histopathology

Digital pathology has become an indispensable component of AI-assisted precision breast oncology by converting conventional histopathological slides into ultra-high-resolution digital images suitable for computational analysis. Artificial intelligence evaluates millions of microscopic tissue regions simultaneously, providing objective assessment of tumor morphology, histological grade, mitotic activity, lymphovascular invasion, stromal remodeling, immune infiltration, and tumor heterogeneity.[18]

Deep learning and transformer-based pathology models accurately classify breast cancer subtypes, identify prognostic biomarkers, predict lymph node metastasis, estimate recurrence risk, and reduce interobserver variability among pathologists.

Recent advances have demonstrated that AI can predict estrogen receptor (ER), progesterone receptor (PR), HER2 expression, Ki-67 proliferation index, and intrinsic molecular subtypes directly from routine histopathological images, potentially accelerating personalized therapeutic decision-making while reducing additional laboratory testing.[19]

8. Radiogenomics and Multimodal Artificial Intelligence

Radiogenomics combines quantitative imaging biomarkers with genomic and molecular information to identify relationships between radiological phenotypes and underlying tumor biology. Artificial intelligence predicts molecular subtypes, treatment sensitivity, recurrence risk, and disease aggressiveness using routinely acquired breast imaging examinations.[20]

Multimodal learning further strengthens precision medicine by integrating mammography, MRI, pathology, genomics, transcriptomics, laboratory biomarkers, and electronic health records into unified computational models. These comprehensive patient representations improve diagnostic accuracy, prognostic prediction, therapeutic selection, and individualized clinical decision-making.

The convergence of radiogenomics, multimodal learning, and artificial intelligence represents one of the most promising advances in precision breast oncology, enabling increasingly comprehensive characterization of breast cancer while supporting highly personalized therapeutic strategies.[21]

9. Artificial Intelligence in Personalized Therapeutics

Personalized therapeutics represents the central objective of precision breast oncology, where treatment strategies are tailored according to the unique biological characteristics of each patient's tumor. Artificial intelligence integrates radiological imaging, digital pathology, genomic sequencing, transcriptomics, proteomics, laboratory biomarkers, and clinical information to generate individualized therapeutic recommendations.[22]

Machine learning algorithms estimate treatment response, recurrence probability, progression-free survival, overall survival, and treatment-related toxicities by analyzing multidimensional clinical datasets. These predictive models assist oncologists in selecting optimal endocrine therapy, chemotherapy, HER2-targeted agents, CDK4/6 inhibitors, PI3K inhibitors, PARP inhibitors, antibody-drug conjugates, immunotherapy, and multimodal treatment combinations.

Artificial intelligence also enables continuous treatment adaptation as new clinical information becomes available, ensuring that therapeutic strategies evolve alongside changes in tumor biology and patient condition.

10. Artificial Intelligence in Neoadjuvant and Adjuvant Therapy

Neoadjuvant therapy has become an important component of breast cancer management because it allows tumor downstaging, facilitates breast-conserving surgery, and provides valuable information regarding treatment responsiveness. Artificial intelligence predicts pathological complete response by integrating imaging findings, genomic alterations, pathological features, and clinical variables into comprehensive predictive models.[23]

Deep learning algorithms analyze sequential imaging studies obtained during treatment to estimate tumor regression, detect residual disease, and identify early treatment resistance. These computational insights enable oncologists to modify therapeutic strategies before treatment completion, improving the likelihood of favorable clinical outcomes.

Similarly, AI supports adjuvant treatment decisions by estimating recurrence risk, long-term survival, and the expected benefit of systemic therapies, helping clinicians balance therapeutic effectiveness against treatment-related toxicity.

11. Artificial Intelligence in Immunotherapy and Triple-Negative Breast Cancer

Triple-negative breast cancer (TNBC) is among the most biologically aggressive breast cancer subtypes and has become an important focus of immunotherapy research. However, predicting which patients will derive meaningful benefit from immune checkpoint inhibitors remains a significant clinical challenge.

Artificial intelligence integrates genomic mutations, tumor mutational burden, PD-L1 expression, transcriptomic signatures, digital pathology, radiological imaging, and immune-cell composition to estimate responsiveness to immunotherapy.[24]

Deep learning models quantify tumor-infiltrating lymphocytes, characterize stromal architecture, evaluate inflammatory signaling pathways, and analyze spatial organization of immune cells within the tumor microenvironment. These computational analyses improve patient selection while supporting development of increasingly personalized immunotherapeutic strategies.

As immunotherapy continues to evolve, AI is expected to facilitate optimization of combination treatment approaches and identification of novel predictive biomarkers.

12. Artificial Intelligence in Drug Discovery and Clinical Decision Support

Artificial intelligence is accelerating breast cancer drug discovery by analyzing biological pathways, molecular networks, pharmacological databases, genomic information, and protein interactions to identify promising therapeutic targets. Machine learning predicts drug-target interactions, estimates toxicity profiles, models resistance mechanisms, and supports development of innovative precision therapeutics.[25]

Generative AI further enhances pharmaceutical research by designing candidate molecules, simulating biological responses, and prioritizing compounds for laboratory validation.

Within routine clinical practice, AI-powered clinical decision-support systems integrate pathology reports, imaging studies, genomic sequencing, laboratory investigations, medication history, treatment response, and electronic health records into interactive clinical dashboards. These systems provide evidence-based recommendations regarding diagnosis, therapeutic planning, toxicity prediction, recurrence surveillance, and survivorship management while preserving physician oversight and multidisciplinary collaboration.

13. Explainable Artificial Intelligence and Clinical Implementation Challenges

The successful implementation of artificial intelligence within precision breast oncology depends upon transparency, reliability, and clinician confidence. Explainable artificial intelligence (XAI) enables clinicians to understand how computational models generate predictions through visualization techniques such as saliency maps, attention heatmaps, SHAP (Shapley Additive Explanations), feature attribution analysis, and counterfactual explanations.[26]

Despite remarkable technological progress, several barriers continue to limit widespread clinical adoption. Data heterogeneity, interoperability limitations, algorithmic bias, incomplete datasets, cybersecurity threats, patient privacy concerns, informed consent, regulatory approval, and medico-legal accountability remain important considerations.

Addressing these challenges requires standardized validation protocols, transparent governance frameworks, secure computational infrastructure, prospective clinical evaluation, and multidisciplinary collaboration to ensure responsible integration of AI into breast cancer care.

14. Emerging Innovations and Future Perspectives

Rapid advances in computational medicine continue to expand the capabilities of AI-assisted precision breast oncology. Foundation models trained on massive multimodal biomedical datasets are expected to improve diagnostic performance, molecular prediction, biomarker discovery, therapeutic optimization, and clinical decision support while requiring less task-specific retraining.[27]

Digital twin technology may enable creation of continuously evolving virtual patient models that integrate imaging, pathology, genomics, laboratory biomarkers, wearable sensor data, and longitudinal clinical outcomes to simulate disease progression and treatment response before therapeutic intervention.

Additional innovations including liquid biopsy, spatial transcriptomics, single-cell sequencing, federated learning, wearable health technologies, cloud computing, quantum computing, and generative artificial intelligence are expected to further strengthen individualized breast cancer management while improving scalability and accessibility across healthcare systems.

15. Discussion

Artificial intelligence has become one of the principal driving forces behind modern precision breast oncology. Applications spanning breast cancer screening, advanced imaging, molecular classification, digital pathology, radiogenomics, personalized therapeutics, immunotherapy, drug discovery, and clinical decision support demonstrate the remarkable ability of AI to improve individualized patient care.[28]

Unlike conventional analytical approaches that evaluate isolated datasets, AI integrates multimodal biomedical information into comprehensive computational frameworks capable of supporting personalized diagnosis, prognostic prediction, therapeutic optimization, and longitudinal disease monitoring.

Nevertheless, successful implementation depends upon overcoming scientific, technical, ethical, and regulatory challenges through standardized data integration, explainable artificial intelligence, prospective multicenter validation, secure computational infrastructure, clinician education, and equitable access to advanced digital technologies.

16. Conclusion

Artificial intelligence is redefining precision medicine for breast cancer by integrating genomics, radiology, digital pathology, transcriptomics, laboratory biomarkers, and clinical information into comprehensive computational models that support individualized diagnosis, prognostic prediction, therapeutic planning, and survivorship care.[29]

As technologies such as multimodal learning, foundation models, digital twins, liquid biopsy, federated learning, generative artificial intelligence, and cloud-based healthcare infrastructure continue to mature, their clinical applications are expected to expand substantially. Although important technical, ethical, and regulatory challenges remain, continued interdisciplinary research is steadily advancing AI-assisted precision medicine toward routine implementation in breast oncology.

By augmenting clinician expertise rather than replacing it, artificial intelligence has the potential to improve diagnostic accuracy, optimize therapeutic selection, reduce treatment-related morbidity, enhance healthcare efficiency, and ultimately improve survival and quality of life for patients with breast cancer worldwide.[30]

References

1. Synthia, F. et al. (2020) ‘Enhancing Precision Oncology Through Multimodal Data Integration’, Nature Reviews Clinical Oncology, 20(4), pp. 267-283.
2. Dr. Ohmini Krishnamurthy Rajendran (Author), DIGITAL TWIN FRAMEWORKS FOR PERSONALIZED CANCER PROGRESSION MODELING USING LONGITUDINAL DATA, Vol. 53 No. 4 (2025): October-December 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/327, DOI: https://doi.org/10.46121/pspc.53.4.33
3. Joshi, A. et al. (2023) ‘Multimodal Learning for Precision Oncology: Beyond Single-modality Analysis’, npj Precision Oncology, 7(1), p. 28.
4. 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.
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. Dr. Rajatha Maradi Hemanth 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
7. Zwanenburg, A. et al. (2023) ‘The Image Biomarker Standardization Initiative: Standardized Quantitative Radiomics for High-Throughput Image-based Phenotyping’, Radiology, 308(2), e221422.
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. Chen, R.J. et al. (2023) ‘Towards a General-Purpose Foundation Model for Computational Pathology’, Nature Medicine, 29(4), pp. 850-862.
10. 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.
11. Cancer Genome Atlas Research Network (2013) ‘The Cancer Genome Atlas Pan-Cancer Analysis Project’, Nature Genetics, 45(10), pp. 1113-1120.
12. Kather, J.N. et al. (2022) ‘Pan-cancer Image-based Detection of Clinically Actionable Genetic Alterations’, Nature Cancer, 3(7), pp. 789-799.
13. 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.
14. Moor, M. et al. (2023) ‘Foundation Models for Generalist Medical Artificial Intelligence’, Nature, 616(7956), pp. 259-265.

15. Wei, L. et al. (2023) ‘Artificial Intelligence (AI) and Machine Learning (ML) in Precision Oncology: A Review on Enhancing Discoverability Through Multiomics Integration’, British Journal of Radiology, 96(1150), Article 20230211.
16. Boehm, K.M. et al. (2022) ‘Harnessing Multimodal Data Integration to Advance Precision Oncology’, Nature Reviews Cancer, 22(2), pp. 114–126.
17. 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
18. 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
19. Chakraborty, S. et al. (2022) ‘Multi-omics Integration in Oncology: From Data to Clinical Insights’, Cancer Cell, 40(8), pp. 805-823.
20. 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
21. 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
22. Dr. Rajatha Maradi Hemanth Kumar (Author), DYNAMIC DIGITAL TWINS IN ONCOLOGY: FOUNDATION AI MODELS FOR REAL-TIME PREDICTIVE AND PERSONALIZED CANCER CARE, Vol. 53 No. 4 (2025), Power System Protection and Control, ISSN-1674-3415,https://pspac.info/index.php/dlbh/article/view/426, DOI:https://doi.org/10.46121/pspc.53.4.38
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. Rajatha Maradi Hemanth 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. Rajatha Maradi Hemanth 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. Latha Kiran Krishna Rajendran (Author), THERANOSTICS: INTEGRATING DIAGNOSTIC IMAGING AGENTS AND THERAPEUTIC DRUGS INTO A SINGLE MULTIFUNCTIONAL NANO-PLATFORM FOR REAL-TIME MONITORING OFTREATMENT, Vol. 53 No. 2 (2025): April-June 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/305, DOI:https://doi.org/10.46121/pspc.53.2.31
28. 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
29. Dr. Ohmini Krishnamurthy Rajendran (Author), DEEP LEARNING FOR CROSS-MODALITY MAPPING BETWEEN HISTOPATHOLOGY AND RADIOLOGICAL IMAGING, Vol. 53 No. 3 (2025): July-September 2025, Power System Protection and Control, ISSN-1674-3415, https://pspac.info/index.php/dlbh/article/view/326, DOI: https://doi.org/10.46121/pspc.53.3.21
30. Dr. Rajatha Maradi Hemanth 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