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Special Issue Reprint

Application of Biostatistics in Cancer Research

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This Reprint presents a curated selection of innovative articles from *Cancers*, published in the Special Issue “Application of Biostatistics in Cancer Research”. It highlights advanced biostatistical and computational methods addressing key challenges in modern oncology, including robust clinical trial design and interpretation, reliable inference with complex real-world data, AI and machine learning for early detection and classification, epidemiologic hotspot identification, and personalized prognostic modeling. Featured contributions strengthen early-phase and survival-based trials through novel metrics such as a modified Fragility Index, optimized proportion tests, and sensitivity analyses for design misspecification. AI-driven approaches include deep learning for melanoma detection, X-ray diffraction analysis for breast cancer triage, videoendoscopic stiffness mapping for glottic lesions, and landmarking-based models for rectal cancer relapse and mortality, enabling noninvasive diagnostics and individualized risk prediction. Bayesian spatial mapping further supports precision public health in high-risk populations. Collectively, these studies advance the integration of rigorous biostatistics, computational innovation, and AI tools to improve trial reliability, diagnostic accuracy, and evidence-based decision-making across the cancer research continuum. This volume serves as a resource for biostatisticians, oncologists, clinical trialists, and data scientists seeking state-of-the-art developments in oncology biostatistics, adaptive methodologies, AI-assisted diagnostics, and personalized cancer care.



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