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EDITORIAL

Launching Genetics, Genomics & Molecular Oncology: A New Scientific Area in PCMB

Genética, genómica y oncología molecular: una nueva área científica en PCMB

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RESUMEN

Los avances en genética, genómica, oncología molecular, epigenética, bioinformática y medicina de precisión están transformando el estudio de las enfermedades humanas y generando nuevas oportunidades para su diagnóstico, pronóstico y tratamiento. *Perspectivas en Ciencias Médicas y Biológicas* incorpora **Genetics, Genomics & Molecular Oncology** como una nueva área temática destinada a promover investigaciones en la intersección entre la biología molecular y la medicina. Se recibirán investigaciones originales, revisiones, estudios metodológicos, comunicaciones breves y perspectivas sobre genómica, transcriptómica, epigenética, ARN no codificante, biología del cáncer, biomarcadores, farmacogenómica, bioinformática, multi-ómica e investigación traslacional. La iniciativa busca además promover colaboración internacional, rigor metodológico, integridad científica y oportunidades para investigadores emergentes.

Palabras clave: Genética; Genómica; Oncología molecular; Epigenética; Biomarcadores; Medicina de precisión; Multi-ómica; Investigación traslacional.

ABSTRACT

Advances in genetics, genomics, molecular oncology, epigenetics, bioinformatics, and precision medicine are transforming the understanding of human disease and creating new opportunities for diagnosis, prognosis, prevention, and treatment. *Perspectivas en Ciencias Médicas y Biológicas* is establishing **Genetics, Genomics & Molecular Oncology** as a new thematic scientific area intended to provide an interdisciplinary space for research at the interface of molecular biology and medicine. The journal welcomes original research, reviews, methodological contributions, brief reports, and scientific perspectives addressing genomics, transcriptomics, epigenetics, non-coding RNAs, cancer biology, molecular biomarkers, pharmacogenomics, bioinformatics, multi-omics, and translational research. This initiative also seeks to promote international collaboration, methodological rigor, research integrity, and opportunities for emerging investigators.

Keywords: Genetics; Genomics; Molecular Oncology; Epigenetics; Biomarkers; Precision Medicine; Multi-omics; Translational Research.

Biomedical research is undergoing a profound transformation driven by advances in genetics, genomics, molecular biology, computational science, and high-throughput technologies. The capacity to characterize biological systems at unprecedented resolution has changed not only how diseases are investigated, but also how they are classified, diagnosed, monitored, and treated. Genomic sequencing, transcriptomics, epigenomics, proteomics, and integrated multi-omics approaches increasingly provide complementary views of disease biology, while molecular oncology has become one of the clearest examples of how these technologies can move from mechanistic discovery toward clinically meaningful decisions.⁽¹⁻⁴⁾

In response to this rapidly evolving scientific landscape, *Perspectivas en Ciencias Médicas y Biológicas* (PCMB) is establishing a new thematic scientific area: **Genetics, Genomics & Molecular Oncology**. The purpose of this initiative is to provide a dedicated space for research connecting fundamental molecular mechanisms with relevant biological and clinical questions. The development of this area was encouraged by the scientific proposals and recommendations of **Dr. Iliyan Pochileev, International Associate Editor of PCMB**, whose experience in genetics, epigenetics, molecular oncology, microRNA biology, and translational research has contributed to defining its initial scope. The area is intentionally broad. It encompasses human and molecular genetics, genomics, transcriptomics, epigenetics, non-coding RNA biology, molecular diagnostics, biomarkers, pharmacogenomics, precision medicine, bioinformatics, multi-omics, and translational molecular research.

Molecular oncology will represent an important component of this initiative. Cancer research illustrates particularly well the interconnected nature of contemporary biomedical science. Tumor initiation and progression cannot be fully understood through isolated molecular alterations alone. Genomic instability, epigenetic regulation, transcriptional programs, microRNAs and other non-coding RNAs, interactions with the tumor microenvironment, immune regulation, metabolic adaptation, angiogenesis, and treatment-induced evolutionary pressures all contribute to malignant behavior. Contemporary models of cancer therefore increasingly require the integration of multiple biological dimensions rather than the interpretation of individual markers in isolation.^(1,3)

This transformation has created important opportunities for biomarker discovery and precision oncology. Updated international recommendations now recognize an expanding role for next-generation sequencing in several advanced cancers and in the identification of tumor-agnostic actionable alterations when matched therapies are accessible.⁽²⁾ Large-scale

initiatives linking genomic profiles with longitudinal clinical information have also shown the scientific and clinical value of integrating molecular and real-world data.⁽⁴⁾ At the same time, the field continues to face major challenges involving reproducibility, external validation, biological interpretation, clinical actionability, cost, infrastructure, and equitable access to molecular technologies.

PCMB therefore seeks contributions that move beyond purely descriptive molecular findings whenever possible and that clearly articulate their biological, clinical, methodological, or translational relevance. The new thematic area will welcome original research articles, systematic and narrative reviews, methodological studies, brief reports, scientific perspectives, and other scholarly contributions addressing genetic variation and human disease, genomic and transcriptomic profiling, epigenetic mechanisms, microRNAs and other non-coding RNAs, molecular pathways in cancer, genomic biomarkers, molecular diagnostics, precision oncology, pharmacogenomics, next-generation sequencing, computational biology, bioinformatics, and integrated multi-omics analyses.

Methodological transparency and reproducibility will be central priorities. Rapid advances in molecular and computational research offer extraordinary opportunities but also create challenges related to study design, high-dimensional data analysis, multiple testing, model overfitting, validation, data availability, and interpretation. Manuscripts should provide sufficient methodological detail to allow readers and reviewers to evaluate the robustness of the research. Whenever appropriate, authors will be encouraged to use recognized reporting guidelines, describe data-processing pipelines clearly, distinguish exploratory from confirmatory analyses, and report limitations without overstating clinical implications.

The responsible use of artificial intelligence is another emerging priority. Machine learning, deep learning, structure prediction, generative models, and other AI-based approaches are increasingly incorporated into genomics, molecular classification, biomarker discovery, drug development, and oncology.⁽⁵⁾ These methods can accelerate hypothesis generation and identify patterns that are difficult to detect using conventional approaches. Nevertheless, computational performance alone should not be confused with biological or clinical validation. PCMB encourages studies that clearly distinguish *in silico* predictions from experimentally or clinically validated findings and that communicate uncertainty, validation strategy, potential bias, and limitations transparently.

Another objective of this initiative is to facilitate international and interdisciplinary collaboration. Molecular biomedical research increasingly depends on

interaction among clinicians, molecular biologists, geneticists, pathologists, bioinformaticians, statisticians, epidemiologists, and computational scientists. A journal can contribute to this ecosystem not only by publishing results but also by creating connections between disciplines, research groups, and investigators working in different settings. PCMB will therefore encourage contributions capable of bridging molecular discovery and meaningful biomedical questions.

The area is also intended to provide opportunities for early-career researchers, doctoral candidates, research trainees, and emerging investigators. Scientific work should be evaluated according to rigor, originality, transparency, and relevance rather than solely according to the seniority, institutional prestige, or geographic location of its authors. Contributions from established international groups and from developing research communities are therefore equally welcome when they meet the journal's scientific and ethical standards.

The establishment of **Genetics, Genomics & Molecular Oncology** forms part of a broader effort to progressively strengthen the scientific identity and international profile of PCMB. Sustainable journal development requires more than increasing the number of published manuscripts. It depends on rigorous peer review, responsible editorial practices, research integrity, consistent publication standards, international participation, high-quality metadata, and contributions that are useful to the scientific community. For this reason, the development of this thematic area will be gradual and quality-oriented rather than volume-driven.

We invite investigators working in genetics, genomics, molecular oncology, epigenetics, bioinformatics, biomarkers, precision medicine, and related fields to consider PCMB as a platform for communicating their research and scientific perspectives. We particularly welcome interdisciplinary studies capable of connecting molecular findings with clinically or biologically meaningful questions. The creation of this new scientific area represents both an expansion of the journal's scope and a statement regarding its future direction: to promote rigorous, internationally connected, and translationally relevant biomedical science while remaining open to emerging methodologies and new generations of researchers.

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