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ELMUMMY

Elucidation of risk factors and health determinants associated with
PROGRESSION of
**Monoclonal Gammopathies
to Multiple Myeloma**



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Project Number: 10109704

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HORIZON-MISS-2021-CANCER-02

The project's Background

Multiple Myeloma (MM) is a persistent malignancy with no current cure, developing resistance to therapies over time. While recent advancements have expanded our understanding of its cellular processes, key aspects of this complex pathology remain unclear. Utilizing omics technologies and bioinformatics on annotated samples from different disease states could reveal pathways and molecules driving onset, progression, and therapy resistance. Emphasis on understanding health determinants and risk factors, particularly in the transition from precursor states (MGUS/sMM) to active MM, is crucial.

With MGUS affecting 3-5% of the aging European population, prevention is vital, and its interdisciplinary approach integrating clinical, experimental, and demographic data aims to create a molecular model for improved MM patient management. This initiative is part of the Cancer Mission cluster focused on "Understanding (Risk factors and determinants cluster)".

The project aims to achieve the following objectives:

- ▶ Establish a comprehensive database encompassing existing samples and pertinent data to better understand the progression from MGUS/sMM to active MM, facilitating data reutilization.
- ▶ Acquire new samples with features that complement or fill gaps in existing biobanks, thereby creating a valuable resource for future investigations.
- ▶ Illuminate the molecular features and risk factors linked to the progression of MGUS/sMM to MM.
- ▶ Explore the biology associated with these molecular features and risk factors, evaluating the impact of combining immunotherapy with existing drugs in treating MM using preclinical animal models.
- ▶ Evaluate the efficacy of selected drugs in preventing the onset of MM.
- ▶ Develop AI-based models that are trustworthy for personalized predictions of MM progression, considering all potential risk factors and health determinants.

ELMUMY aims to advance the understanding and treatment of MM, the second most common hematologic malignancy. It proposes a comprehensive approach, leveraging large clinical cohorts, high-throughput bioassays, and data integration to create predictive models.

The potential impact includes:

- Improved biomarkers for predicting MM onset.
- Identification of therapeutic targets through regulatory network analysis.
- Correlation of cellular changes with clinical outcomes for better patient stratification.
- Generation of personalized datasets for customized treatment approaches.

In terms of economic and societal impact, MM imposes a significant healthcare burden, with high treatment costs and no definitive cure. The research aims to address these challenges, by targeting MM progression and validating new treatments through clinical trials, ultimately offering patients longer and healthier lives.

Consortium



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Coordinator: Prof. M. A. Dimopoulos, National and Kapodistrian University of Athens