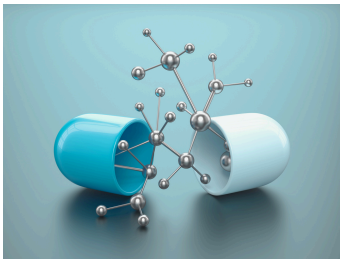

SCIENCE BREAKTHROUGH

MOLECULAR MEDICINE FOR THE GENERAL ONCOLOGIST #5

Through our BSMO newsletters and flashes, we aim to improve our knowledge of molecular biology and NGS by publishing a series of small articles that will update or improve your understanding of this very hot topic. We will put a specific focus on practical important aspects for daily oncological practice.
Like NGS, this effort is multidisciplinary and, involves several experts in the field : Dr Philippe Aftimos (medical oncologist at Institut Jules Bordet), Dr Brigitte Maes (pathologist at Jessa Ziekenhuis), Dr Vasiliki Siozopoulou (pathologist at Cliniques universitaires Saint-Luc), Dr Léon Van Kempen (pathologist at UZ Antwerp), coordinated by Dr Cédric van Marcke (medical oncologist at Cliniques universitaires Saint-Luc).

Clinical interpretation of next generation sequencing data

by Cédric Van Marcke, Cliniques Universitaires Saint-Luc

The fourth newsletter was dedicated to clinical actionability, and introduced to the facts that variants and broad genomic alterations frequently have to be interpreted in the context of the tumor type.
As we conclude this series on precision oncology, we turn our attention to an essential tool in translating genomic data into clinical action: the Molecular Tumor Board (MTB). Through multidisciplinary collaboration and evidence-based discussions, MTBs serve as a pivotal resource to maximize the utility of NGS technologies and ensure actionable genomic variants are not overlooked.

The organization and aims of MTBs

MTBs bring together experts from diverse fields—most frequently medical oncologists, pathologists, geneticists, bioinformaticians, and organ specialists. These boards meet regularly to review complex cases and discuss genomic findings in a structured and multidisciplinary format.
MTBs are complementary to organ-specific tumor boards, providing a broader perspective on therapeutic possibilities offered by the presence of genomic alterations.

The primary aims of an MTB include:

- Evaluating the clinical relevance and actionability of genomic variants identified through NGS
- Recommending targeted therapies or clinical trial options based on the latest scientific evidence
- Guiding the selection of the most appropriate NGS panel for individual cases, tailored to the tumor type and the clinical question at hand
- Considering the potential germline origin of variants highlighted by a somatic NGS analysis

Complementing organ-specific tumor boards

While organ-specific boards remain indispensable for most standard-of-care discussions, they may lack the specialized knowledge required to interpret complex genomic data. Indeed, consideration of the impact of genomic data in other tumor types can offer new and original treatment options.
MTBs, in contrast, offer:

- Comprehensive genomic insights: By pooling expertise, MTBs ensure no actionable variant is overlooked, particularly when the actionability of certain alterations may only be proven in other tumor types.
- Support for rare and challenging Cases: MTBs incrase the insights for rare tumors or atypical presentations, where standard guidelines may be lacking. These boards can synthesize data from limited literature and propose innovative treatment strategies.
- Optimized selection of the NGS panels to use : In cases where NGS testing is yet to be performed, MTBs can advise on the most appropriate panel based on tumor type, clinical history, and emerging research.

MTB: the situation in Belgium

The BSMO is active since many years in the field of precision oncology. Together with many stakeholders, several nation-wide initiatives were taken to increase knowledge and access to precision oncology in clinical practice.

The GeNeo and BALLETT studies were key to set up a national MTB, along with democratizing access to comprehensive genomic profiling (CGP). Collaborations of experts across Belgium, and weekly discussion of NGS results of patients, ensured all potentially pertinent clinical studies were considered, irrespective of the treating hospital.

Next to the high value of the collaborative effort in setting up a national MTB, the strong message from these studies was the demonstration of the dramatically increased value of CGP as opposed to the nationally reimbursed small NGS panels (BALLETT : identification of actionable genomic variants in 81% and 21% of patients with advanced cancer, respectively).

However, a national MTB will never allow to discuss all cases treated in Belgian hospitals. As standardly done in healthcare practice, Regional MTBs will be crucial to handle most cases locally, and referring particularly challenging cases to the national MTB for more advanced recommendations. This system would mirror the tiered approach already used in our healthcare for most pathologies.

Therefore, the next objectives are to convince the healthcare system of the added value of reimbursing CGP in well-thought situations, and providing the means to gather experts across multiple hospitals together, in regional and a national MTB. Some MTBs are active in Belgium, but working mostly pro bono, seriously jeopardizing the sustainability of the project over the upcoming years.

References

Thouvenin J et al, ESMO Open 2022
Volders PJ et al, NPJ Precision Oncology 2025
Aftimos P et al, ESMO 2023

recent publication of BSMO BALLETT study by Volders et al

General conclusion: close connections across medical specialties are mandatory to build the future of precision oncology

Outside highly known variants (e.g., classic EGFR mutations in NSCLC, BRAF V600 mutations in melanoma), the complexity of genomic data demands a team-based approach for optimal interpretation and application. By fostering collaboration and leveraging diverse expertise, MTBs increase the knowledge to make informed, personalized treatment decisions for our patients.
As genomic medicine and the armamentarium of targeted therapies exponentially evolve, MTBs will more and more become invaluable for integrating new discoveries into clinical practice.
We hope this series has provided valuable insights and practical tools to support you in navigating the expanding landscape of precision oncology.

Special Acknowledgement

We are extremely grateful to Dr. Cédric van Marcke who came up with the idea to develop this series and actually brought it to fruition.

This BSMO special series of articles on precision oncology is also available on our website.