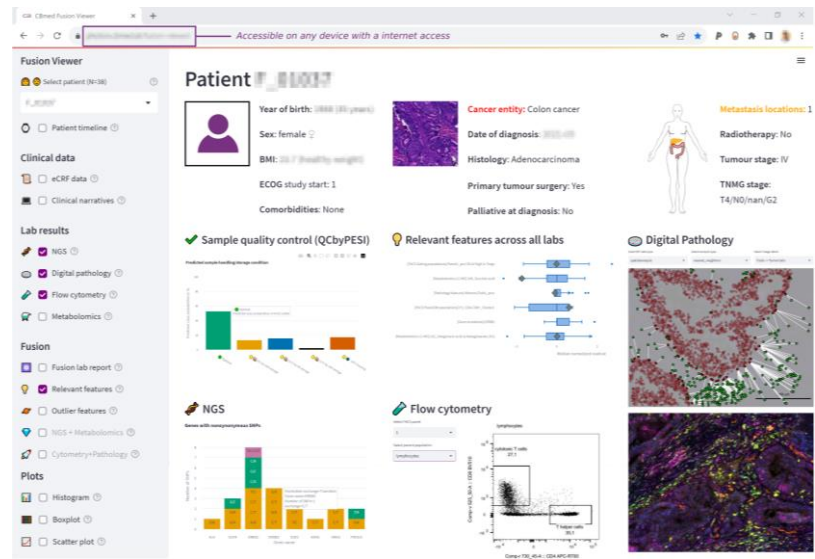


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# A NEW VIEW ON CANCER PATIENTS: BRINGING DATA VISUALIZATION INTO THE CLINICS

THE COMBINED VISUALIZATION OF CLINICAL AND LABORATORY DATA IN TUMOR BOARDS ENABLES NEW INSIGHTS INTO REFRACTORY CANCER PATIENTS

Precision medicine has made enormous contributions to healthcare: from prediction to detection, diagnosis, prognosis, and treatment of many diseases. The highest impact contributions are possibly in the sub-field of oncology where the precision medicine paradigm proved so valuable that not only did it massively expand the portfolio of anti-tumor agents and companion diagnostics, but made targeted therapies become mainstream.

Despite these impressive results, targeted therapies still have limitations, as they are restricted to very specific cases, generally based on a genetic mutation of the tumor (e.g., trastuzumab for HER2-expressing

breast cancers). In cases where neither standard nor targeted therapies can be applied or where they did not work, doctors are faced with the difficult situation of making decisions on how to proceed based on experience, scientific literature, and clinical trials. However, they often have a limited amount of biological information about that specific patient.

The main aim of Fusion Technology is to shed some light into these complex cases and help doctors in their decision making by using a combination of state-of-the-art laboratory technologies (metabolomics, flow cytometry (FACS), and immune histochemistry (Digital Pathology) as well as clinical narrative data.

## SUCCESS STORY

To make this data visible to oncologists, we developed *FusionViewer*, a web-based data visualization tool tailored for the use in so-called molecular tumor boards – a meeting of specialists from different medical and biological fields with the purpose of picking the next therapy for any given patient. After sample collection, processing and measurement in our labs, we use *FusionViewer* to display all biological results together with semantically enriched clinical text data to provide a holistic view of the patient.

This includes a comparison of each selected patient with the remaining cohort of patients stored in a database and the automatic integration of third-party resources through application programming interfaces. By making all plots and results interactively, this approach hides the complexity of the data processing while enabling end-users to get additional information on all presented results. This was made possible by a tight integration of end-user feedback during the development cycles, which led – among others – to the inclusion of a large language model (LLM) that lets the users query the data with a simple chat-bot interface.

In addition, associations between clinical data and biomarkers for patients are also shown, to reveal meaningful patterns in the overall data. This application is useful even outside of a classical molecular tumor board setting where researchers

want to investigate the patient data on a cohort level to identify new potential biomarkers.

All components were designed with GDPR compliance in mind to serve as a robust basis for future co-development with industry and health-care providers.

CBmed is collaborating with Roche to incorporate Fusion Technology into Roche's NAVIFY® Decision Support. NAVIFY® is a patient-centric fully integrated portfolio of scalable, secure workflow solutions and apps to help doctors make better decisions in cancer treatment.

### Impact and effects

This is a pioneering effort and an enormous step in the field of precision medicine that follows the widely accepted principle that a patient-centered holistic vision is necessary to provide the best possible treatment. It is therefore expected that Fusion Technology helps oncologists make more informed decisions in complex cases as well as save time in the process.

*FusionViewer* has gained attention from international research institutes and hospitals and is currently being further developed to adapt to new data and to be suited for different deployment scenarios.

## SUCCESS STORY

### **Project coordination (Story)**

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