MSIpad

Providing healthcare professionals with a better, affordable and evidence-based tool to improve pathology diagnosis and initiate personalized therapies

SMART HEALTH

To diagnose cancer and determine the most appropri- ate treatment, pathologists commonly use an approach called 'visual histopathology' – using microscopes to study patients' cells and tissues. Yet, visual histopathology has its limits and is not always very accurate. For instance, tumors with the same histopathological features can have very different clinical causes and require different treatments. Hence, a proper classification of tissue samples is crucial.

One highly promising alternative to analyzing tissues leverages mass spectrometry imaging (MSI), which makes it possible to determine the exact spatial distribution of chemical compositions (compounds, biomarkers, proteins, etc.) in any given tissue. Moreover, it comes with the additional benefit that a very large range of molecules can be analyzed at once. But as MSI is a relatively new technology, it still faces some challenges which prevent it from being used in clinical routine.

"The use of MSI still comes with some important drawbacks – such as the need for expensive equipment and expert knowledge in informatics, as well as the computational difficulties related to extracting meaningful facts from very big and complicated datasets," explains Xian Mao (imec - KU Leuven). "Through MSIpad, we wanted to further explore the potential application domains of MSI technology, address some of its shortcomings and contribute to making MSI commonly available to pathologists and pharmaceutical researchers as an objective decision-support tool."

MSIpad focused on two use-cases. The first one included a better and more accurate diagnosis of lymphomas to facilitate a more accurate treatment, better chances of recovery and a decrease of the related medical costs. The second use-case dealt with a more efficient discovery and development of diabetes medicines by enabling a quick analysis of the molecular changes they provoke.

Project outcomes

- A fully functional software prototype that is 2x more cost-effective and 10x faster to use than current histopathology approaches
- A pipeline descriptor and user-friendly interface that allow non-specialists to exploit MSI's full potential
- A library of predefined molecular profiles — related to MSIpad's two use-cases

Download the leaflet

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Project information

Industry

- UZ Gasthuisberg
- Pathomation
- reMynd

Research

- KU Leuven - Laboratory of Protein Phosphorylation and Proteomics
- imec - STADIUS - KU Leuven

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