Applications of Tissue Microarray (TMA) platform for the Molecular characterization of Cancers

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Tissue Microarray (TMA) facilitates rapid high throughput analysis and profiling of molecular targets on multiple tissue samples simultaneously. The multifold approach helps parallel reactions to happen at the same time, reducing run-time and minimizing tissue loss or damage. Construction of TMAs comprises of making cylindrical core specimens from 100s of FFPE tissue samples and arranging them in the form of arrays on a TMA block. Each of these blocks can be subjected to molecular reactions at the DNA, RNA or the protein levels. A single TMA procedure can evaluate 100s of samples at the same time for a single target, contrary to conventional practices where only one sample can be characterized at a time. Most of the applications of TMA have been in the field of cancer research and diagnostics. Examples include qualitative and quantitative evaluation of molecular alterations in tumor samples, analysis of prognostic and predictive markers, search for newer drug targets in the molecular level and understanding of tumor staging and progression. The presentation would comprise of application of TMAs in cancer research, drug development & validation and cross-tissue gene expression studies. We would like to discuss some limitations of TMA platforms, the way it can automated and with the help of dedicated softwares, the process can be quite fast and sensitive.