

Background

The tumor microenvironment (TME) is being increasingly recognized as a key factor in multiple stages of disease progression, particularly local resistance, immune-escaping, and distant metastasis, thereby substantially impacting the future development of frontline interventions in clinical oncology. An appropriate understanding of the TME promotes evaluation and selection of candidate agents to control malignancies at both the primary sites as well as the metastatic settings.

A tumor is not made of isolated and homogeneous cell population but is the result of a complex network of interaction between: the tumor itself, and the host system.

We need to think and describe a tumor as an organ like structure with a complex dynamics and cross talk between: tumor, stromal and immune cell, extracellular matrix and extracellular molecule, tumor microenvironment.

An increase number of investigation on a major role played by the microenvironment has enlarged the amount of data produced in the field of cancer biology.

The absence of standardized, computable representations of cancer microenvironment and its influence in progression of cancer poses a significant barrier to progress in cancer research, and in turn to the diagnosis and treatment of cancer. Standardized vocabularies are needed to ensure the consistent use of terminology, thereby facilitating the sharing of research results between subspecialties and the translation of research results into clinical practice. Machine processable representations are of further value and are becoming critical as biomedical research becomes ever more reliant on computational assistance in the management and analysis of data and information. Standardized, computable representations, here referred to as ontologies, are at the foundation of methods for sharing data and making heterogenous data resources interoperable.

To address this gap in the information and computational resources critical to progress in cancer research, we are developing the Tumor micro Environmental Ontology. The potential impact of this ontology is significant, broadly impacting both the research and clinical care communities.

Current Challenges

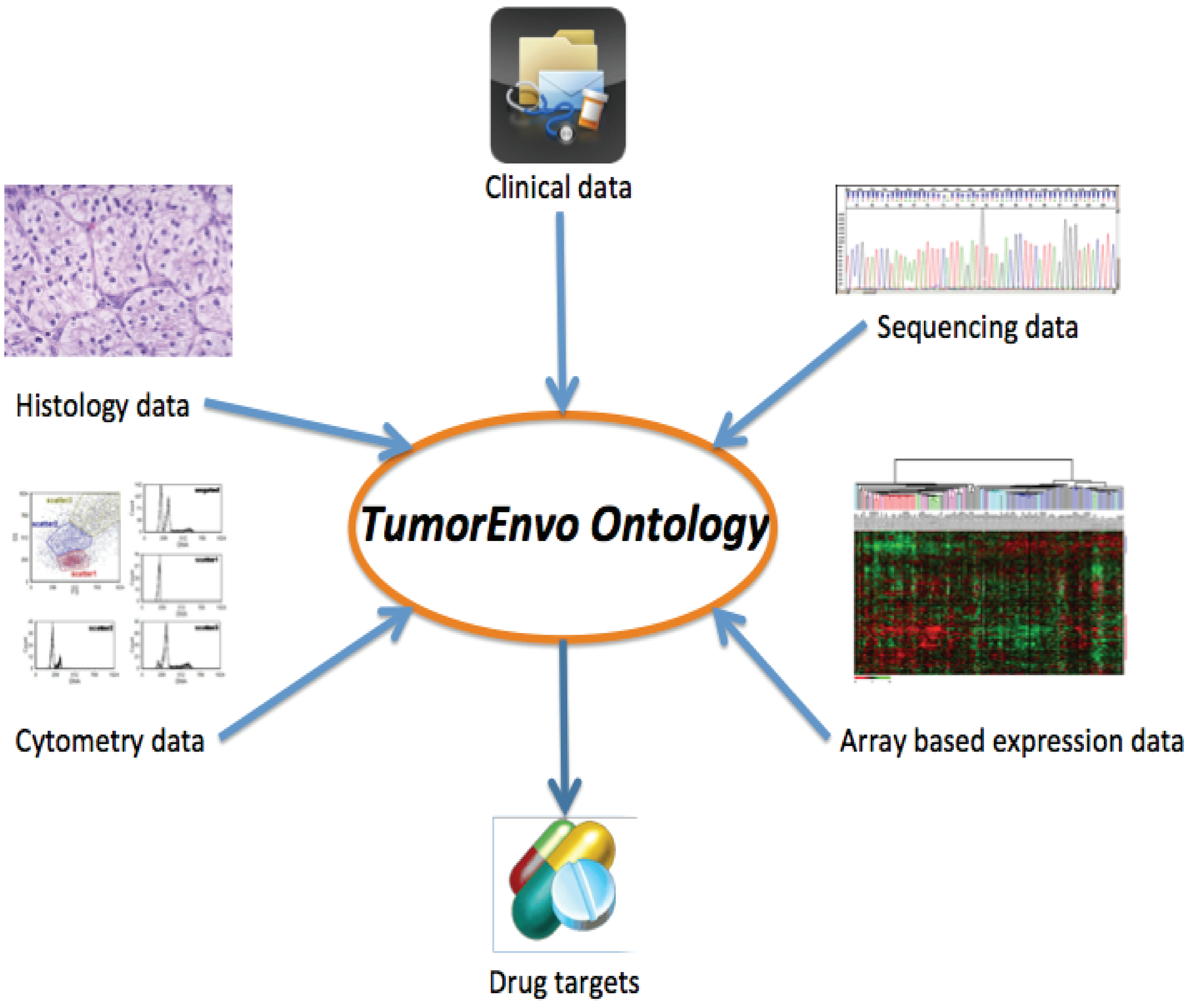
- Tumor microenvironment phenotype is not well define
- The crosstalk between the tumor microenvironment and the cancer cell is not always clear
- The influence of the tumor microenvironment on the immune response need in deep investigation

These are just few examples of missing information that limit the understanding the tumor biology.

Thus we are developing a TumorEnvo ontology

Advantages of TumorEnvo

- Provides a resource for heterogeneous data on tumor microenvironment annotation and integration
- Provides a standard representation of tumor microenvironment information
- Provides a computable resource for reasoning over tumor microenvironment information



TumorEnvo Ontology

