Precision Medicine

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Precision Medicine Pathology Experiential Internship

Summer 2022

AbbVie Bay Area (ABA)

2022 Precision Medicine Pathology, Histology Internship

I. PMed Pathology

II. Project Overview

III. The Broader Context

IV. Conclusion

"The right drug for the right patient at the right time is the mantra of personalized medicine"

- Micheal O. Leavitt, Precision Medicine Coalition, 23 March 2007

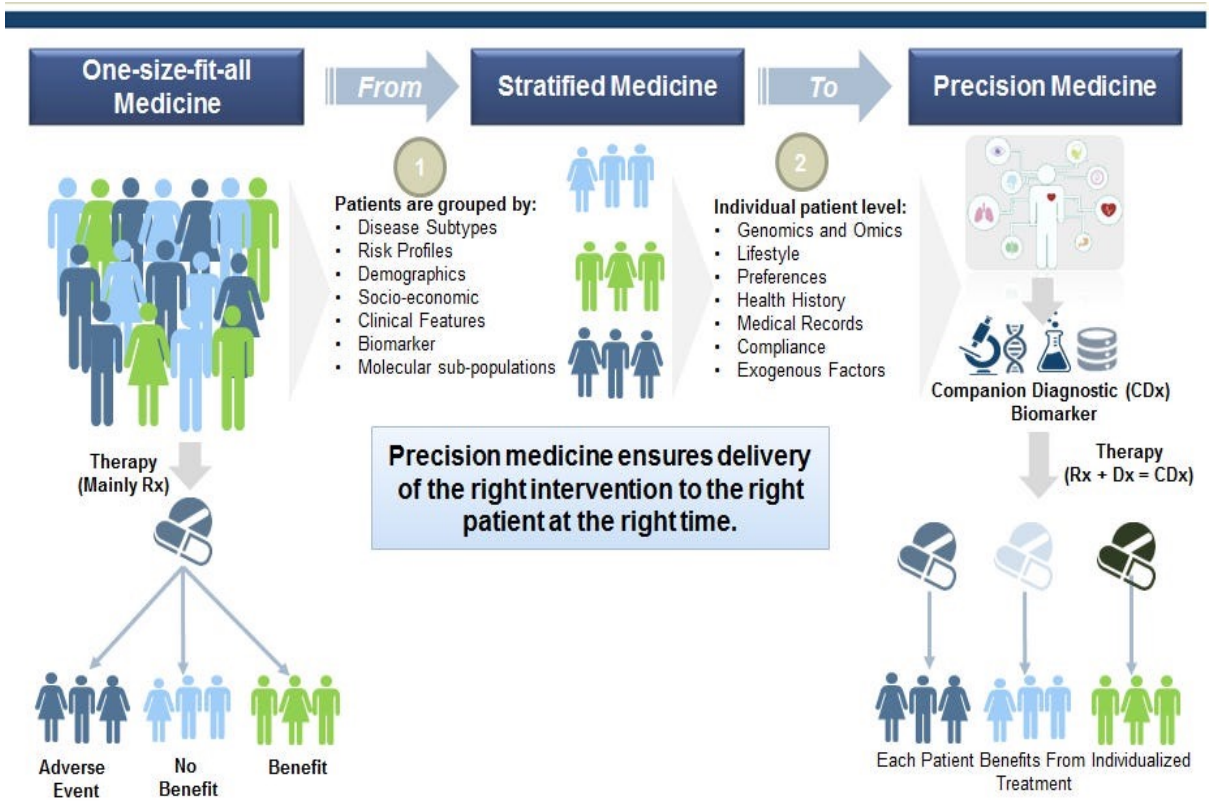

Figure 1: Paradigm Shift in Treatment (Frost & Sullivan, 2017)

I. Precision Medicine Pathology

Our Purpose: To co-develop slide-based diagnostic tests for AbbVie therapeutic treatments – these tests are known as companion diagnostic (CDx) assays

Subgroups:

A. **Histology:** Histology labs transform patient **tissue** into a preserved sample that can be viewed by pathologists under a microscope

B. **Immunohistochemistry (IHC):** IHC labs utilize dyes and chemicals to colorize cellular structures and indicate the expression levels of specific biomarkers

C. **Image Analysis:** Image analysts write algorithms and employ A.I. software to increase the efficiency and speed with which pathologists can read patient cases

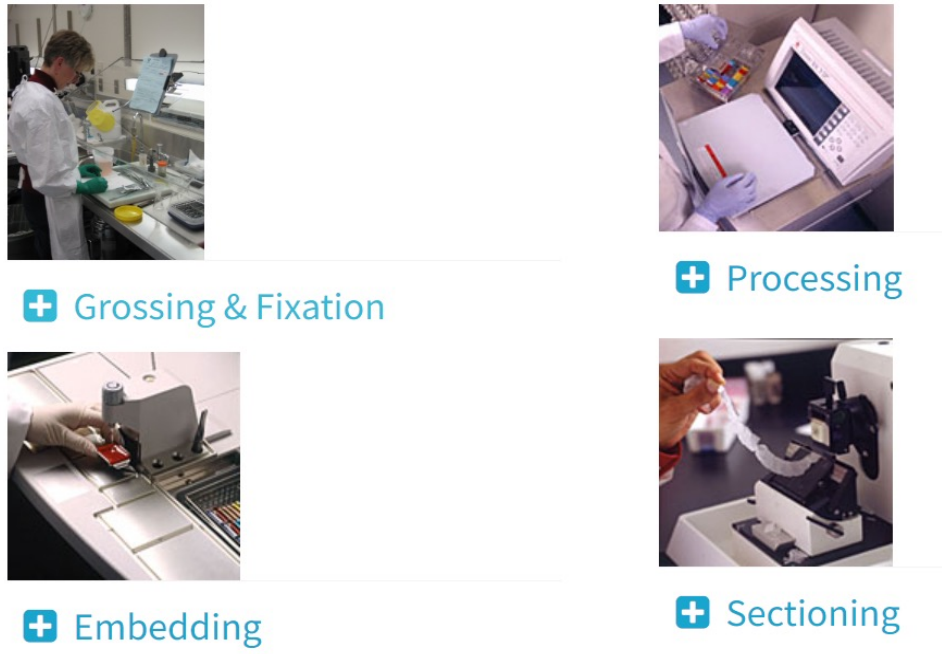

Figure 2: Histology Procedures (NSH, 2022)

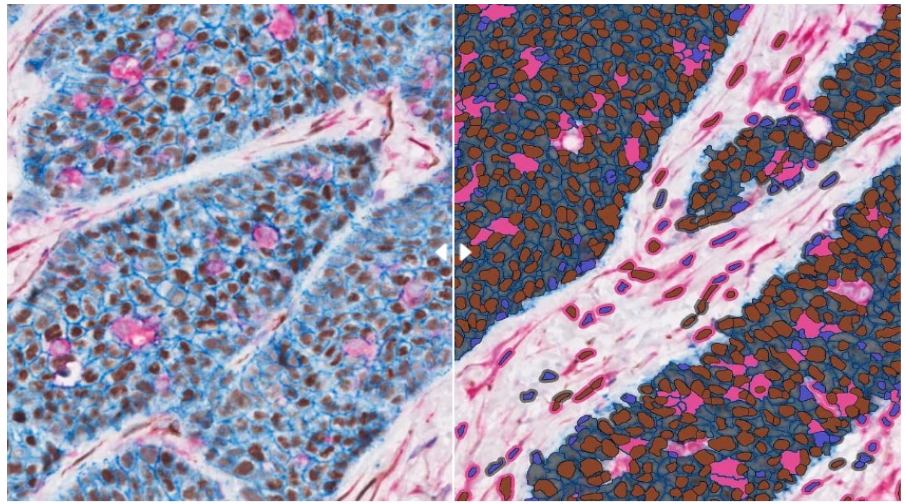

Figure 3: Multiplex IHC (Indica Labs, 2022)

II. Project Overview: Frozen Specimen Metadata Curation

Goal: To assist Precision Medicine Histology in migrating *frozen* biospecimen metadata

A. PMed Pathology is the first group to integrate information from patient samples into a unified database

   1) Company-wide initiative to merge biospecimen data from all AbbVie functional teams into a shared, interactive dashboard

B. PMed histology lab has ~1,200 frozen samples that are matched to tissue blocks in the FFPE inventory

C. Frozen sample data has not been well-documented in the past

   1) Each sample requires at least 20 fields of information

   2) Approximately 30,000 individual cells from sample data needed to be reviewed

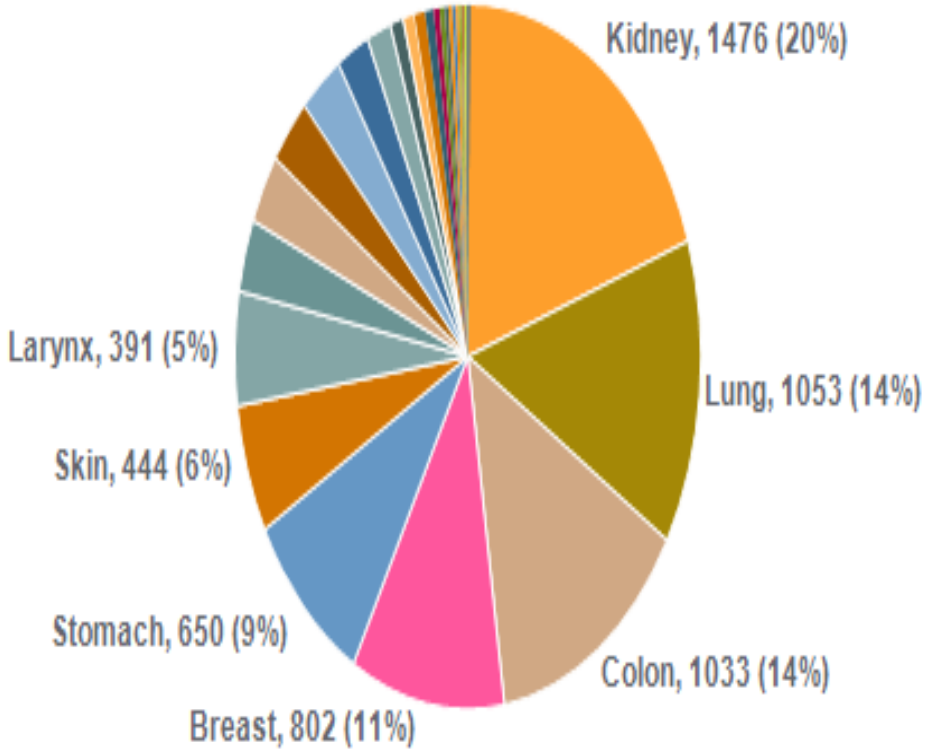

Figure 4: Spotfire Dashboard Visualization

II. Project Overview: Teliso-V (ABBV-399)

A. Background Information

1) AbbVie was granted FDA Breakthrough Therapy Designation (BTD) for Teliso-V on January 4, 2022
    a. Phase III trials investigating the efficacy in treating c-met overexpressing, previously treated NSCLC
2) Eligibility for clinical trials is currently determined by a traditional IHC CDx screening for c-met amplification

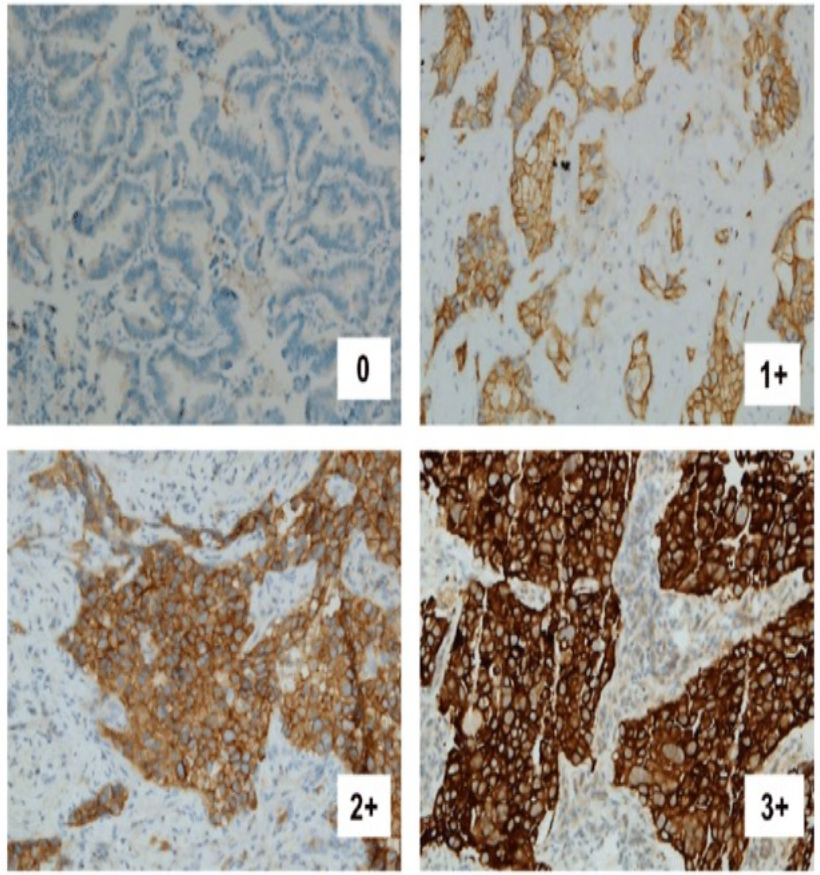

Figure 5: Traditional IHC stains for c-met amplification

III. The Broader Context: NGS Data and Emerging Assays

A. Traditional CDx	B. Liquid CDx
1) Require tissue sampling – highly invasive	1) Minimally invasive, rapid, precise
2) Visualization of a single point in time	2) Long-term monitoring through repeated sampling
3) Limitation in number of biomarkers to be examined at once	3) Easier integration of NGS to analyze thousands of genes at one time

IV. Conclusion

A. How did I make an impact this Summer?

1) Pmed Pathology can leverage the frozen sample data and explore different sample types for CDx
    a. Options other than tissue-based CDxs can maximize patient benefit and expand their opportunities for treatment
2) Pmed Pathology team can perform in-depth comparison between tissue and liquid assays
    a. Since each frozen sample has a matched FFPE tissue block
3) NGS of these samples could:
    a. Lead to the discovery of novel therapeutic targets
    b. Predict drug resistance, optimal dosages, and potential side-effects

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