Biomarker Panel Discussion

Question 2.

- **What human samples should be collected, and how should they be used?**

- **Does this vary between discovery, validation and implementation?**

Biomarker Discussion Panel

- **All biological samples are eligible for collection**
- **Collected biological material depends on analyte and tissue source**

Examples

- **Biological fluids**
  - **Serum, plasma, urine, csf**
  - **Secretions**
    - **Saliva, seminal fluid**
  - **Body cavity fluids**
    - **Pleural fluid, peritoneal fluid, etc**
- **Specific tissue material**
  - **Specialized cells – reproductive cells**
- **Non-cellular**

Biomarker Discovery

Question 2 (contd).

- **Does this vary between biomarker discovery, validation, and implementation?**

- **Ideal**
  - **Biomarker discovery samples should be identical to the projected testing situation**
  - **(e.g. Do not study plasma for discovery, and then validate or implement assay using serum)**

- **Practical**
  - **set up study with samples that are as close to the testing situation as possible**

Biomarker Panel Discussion

Question 3.

- **What is the role of routinely accessible biofluids such as plasma, serum, and urine?**

- **What is the role of "proximal" fluids like CSF, synovial fluid, ascites, pancreatic ductal fluid, broncheolar lavage fluid, etc?**

- **What is the role of solid tissues?**

Biomarker Panel Discussion

Role of routinely accessible biofluids

- **Very important in the discovery of biomarkers of diseases (systemic vs. organ specific/local)**

- **Important for:**
  - **early detection**
  - **disease severity**
  - **tumor burden**
  - **prognosis**
  - **monitoring of response to therapy**

Biomarker Panel Discussion

- **“Proximal fluids”**
  - **Can reflect disease perturbations in the organs or tissues from which they are secreted**

- **Solid tissues**
  - **Very important for the development of novel in-situ biomarkers**
    - **Immunofluorescence, immunocytochemistry**
    - **Imaging mass spectrometry**

Biomarker Panel Discussion

Question 4.

- **Must human sample collection be prospective, or can existing repositories be used?**

- **What considerations are important in determining the adequacy of repository samples?**

Biomarker Panel Discussion

- **Ultimate confirmation of the validity of a biomarker has to be proven in a prospective study**

- **Nevertheless, well designed retrospective studies using well characterized samples in repositories can be performed and frequently yield viable candidates**

Biomarker Panel Discussion

Considerations for sample adequacy

- **Validity of disease categorization**
- **Integrity**
- **Degradation**
- **Contamination (microorganisms, extraneous material)**

Biomarker Panel Discussion

Considerations for sample adequacy

- **Plasma**
  - **Storage**
  - **Hemolysis**
  - **Influence of anticoagulants**

- **Serum**
  - **Storage**
  - **Consistent results**

Biomarker Panel Discussion

Question 6

- **What if any roles do cell lines or primary tissue culture systems play in biomarker discovery?**

- **What is the role of animal models?**

Biomarker Panel Discussion

Cell lines

- Very important in the discovery of biomarker candidates
- Viable primary tumor samples are difficult to maintain ex vivo, limited in quantity for distribution and are not renewable
- Nevertheless, (when possible) validation should be performed using primary tumor samples e.g. immunohistologic methods, Imaging MS

Biomarker Panel Discussion

Role of animal models

- Xenograft models of human tumors
  - Useful for identification of biomarkers produced by tumor
  - Caveats
    - Host response
    - Tumor burden
- Transgenics
  - Useful in studying disease pathogenesis
  - Limited impact in biomarker discovery