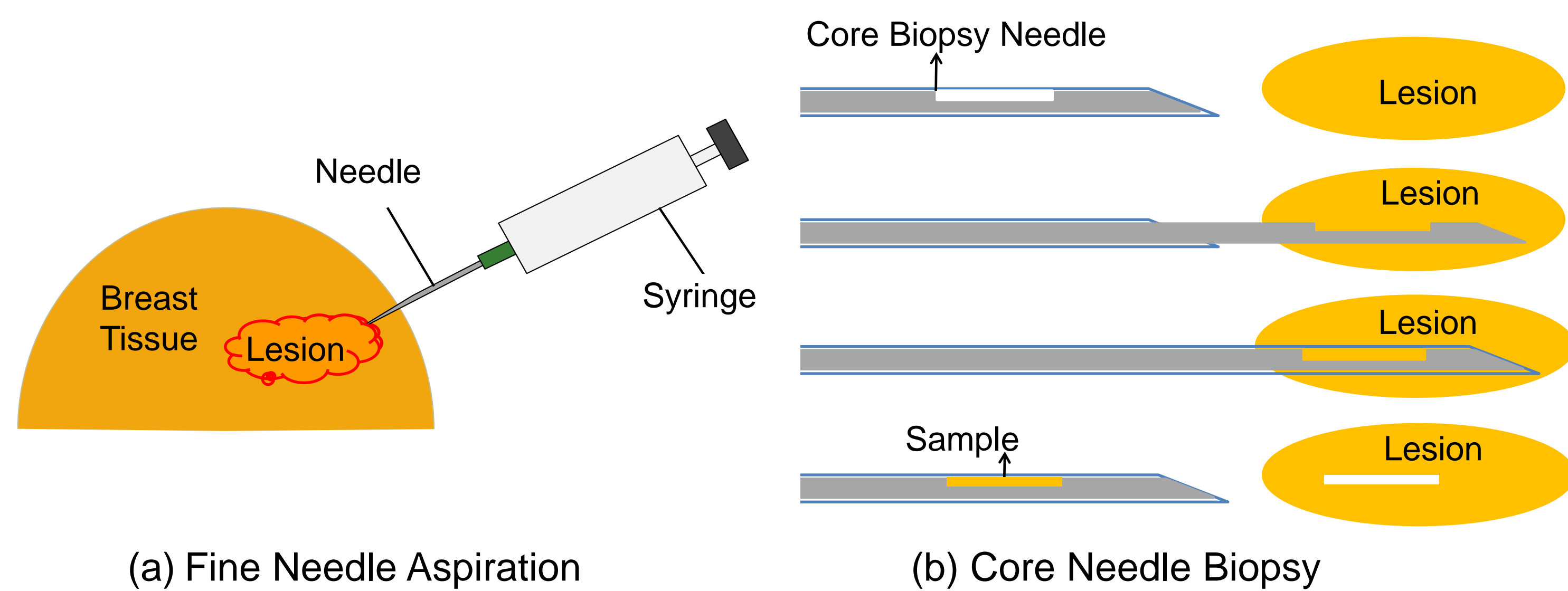


## DEVELOPMENT OF COAXIAL NEEDLES FOR BREAST CANCER BIOPSY

### BREAST CANCER BIOPSY

Biopsy needle sampling methods:



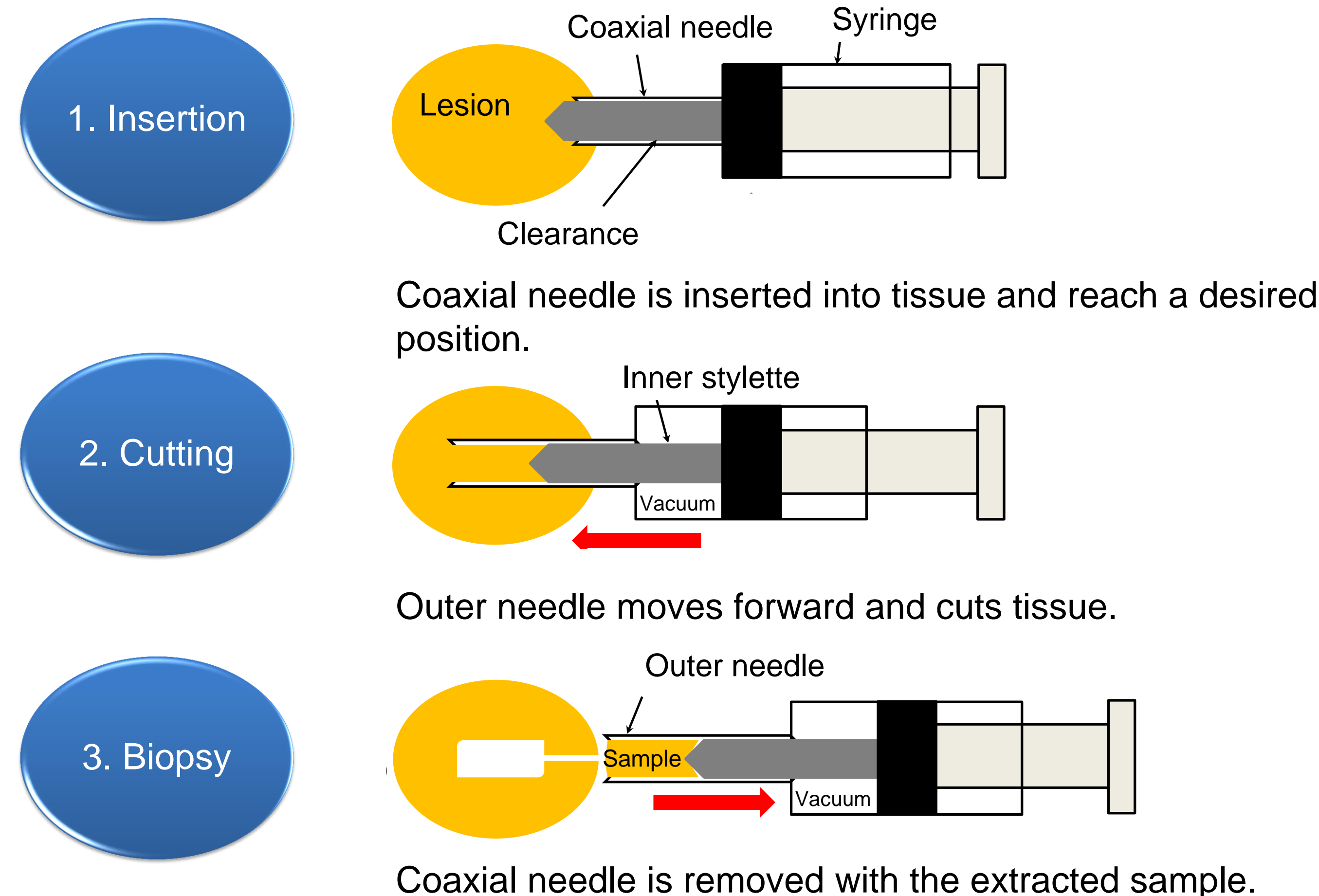
#### Challenges:

- Improve cost effectiveness
- Reduce discomfort of patient during biopsy procedure
- Improve diagnostic accuracy
- Decrease damages in extracted tissue

#### Objectives:

- Develop a cost effective biopsy method
  - Less damage in tissue
  - Bigger sample extraction with smaller needle diameter

### DESIGN OF COAXIAL BIOPSY NEEDLES



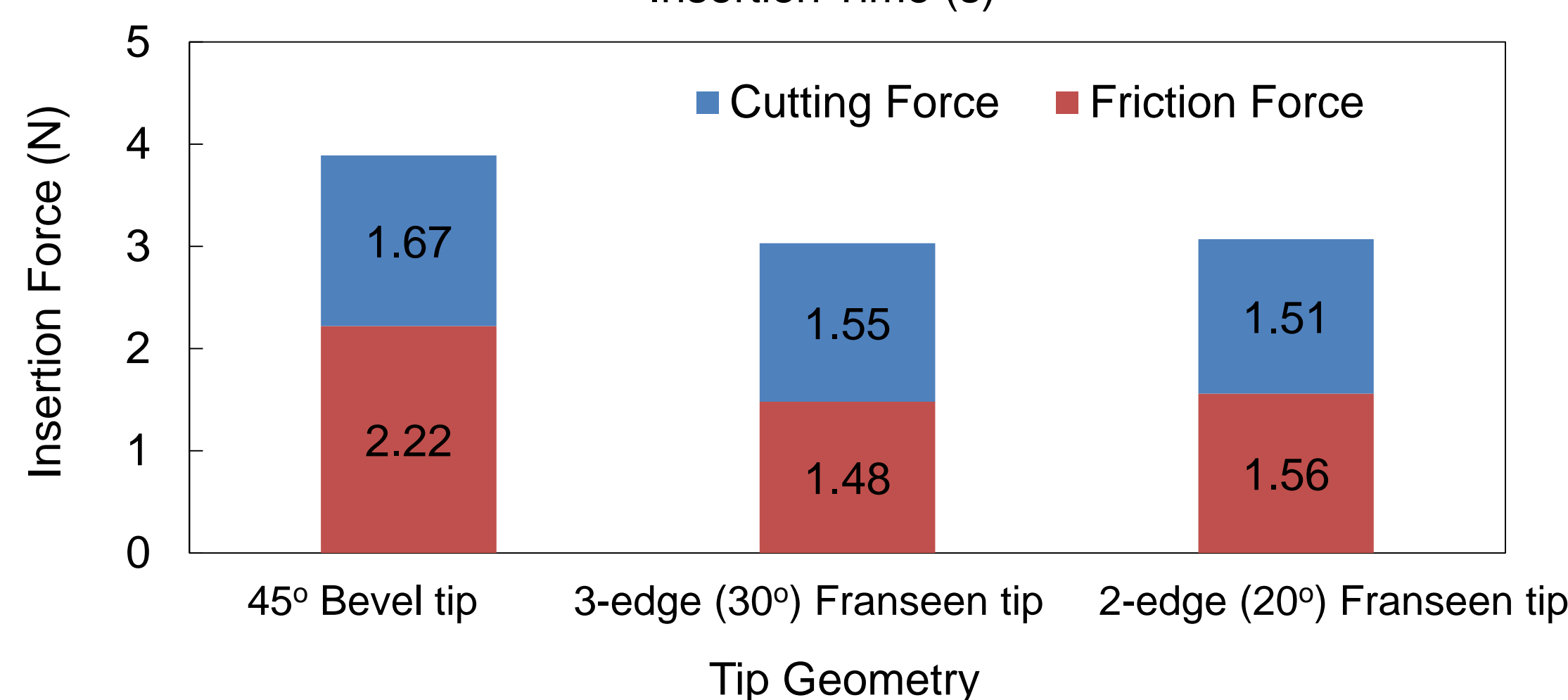
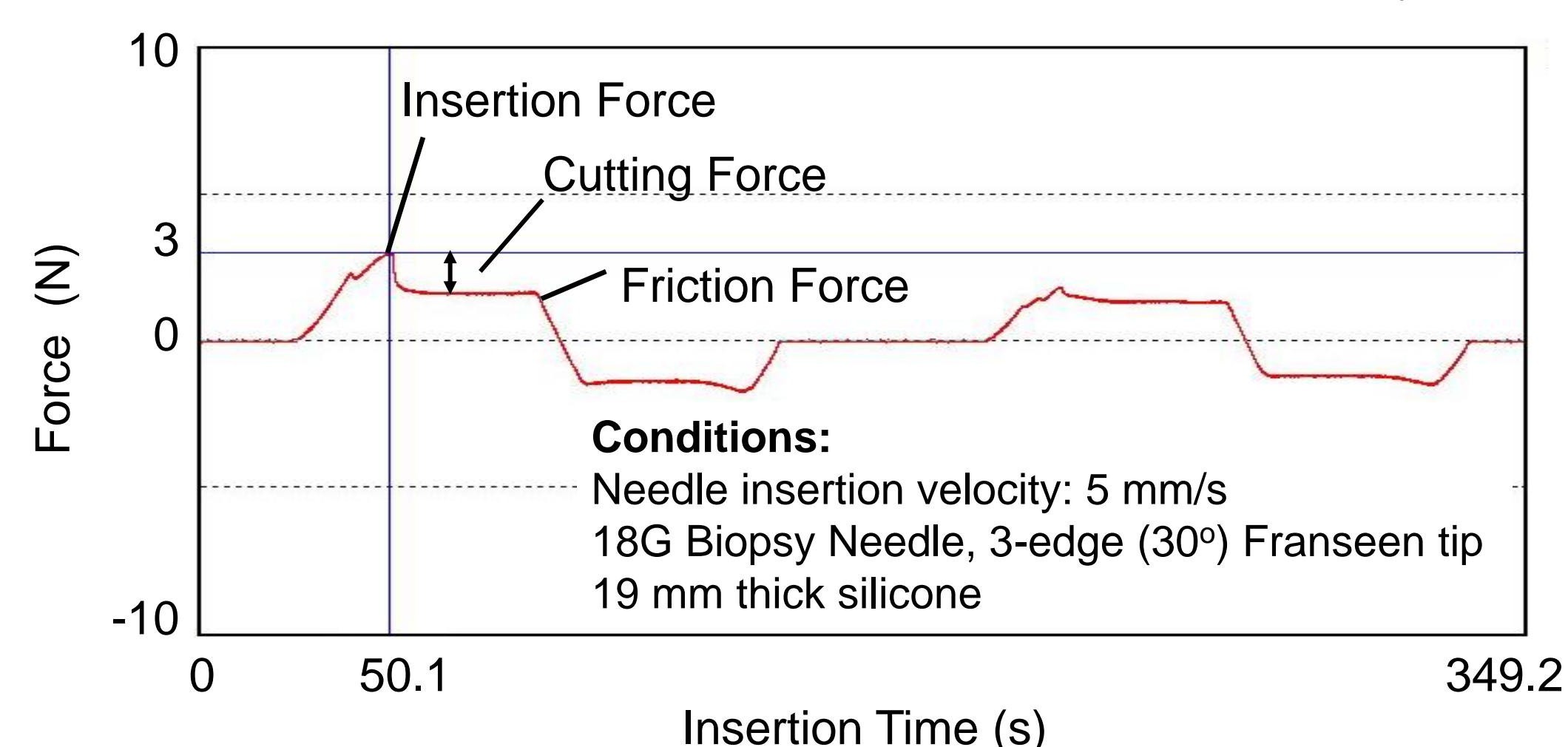
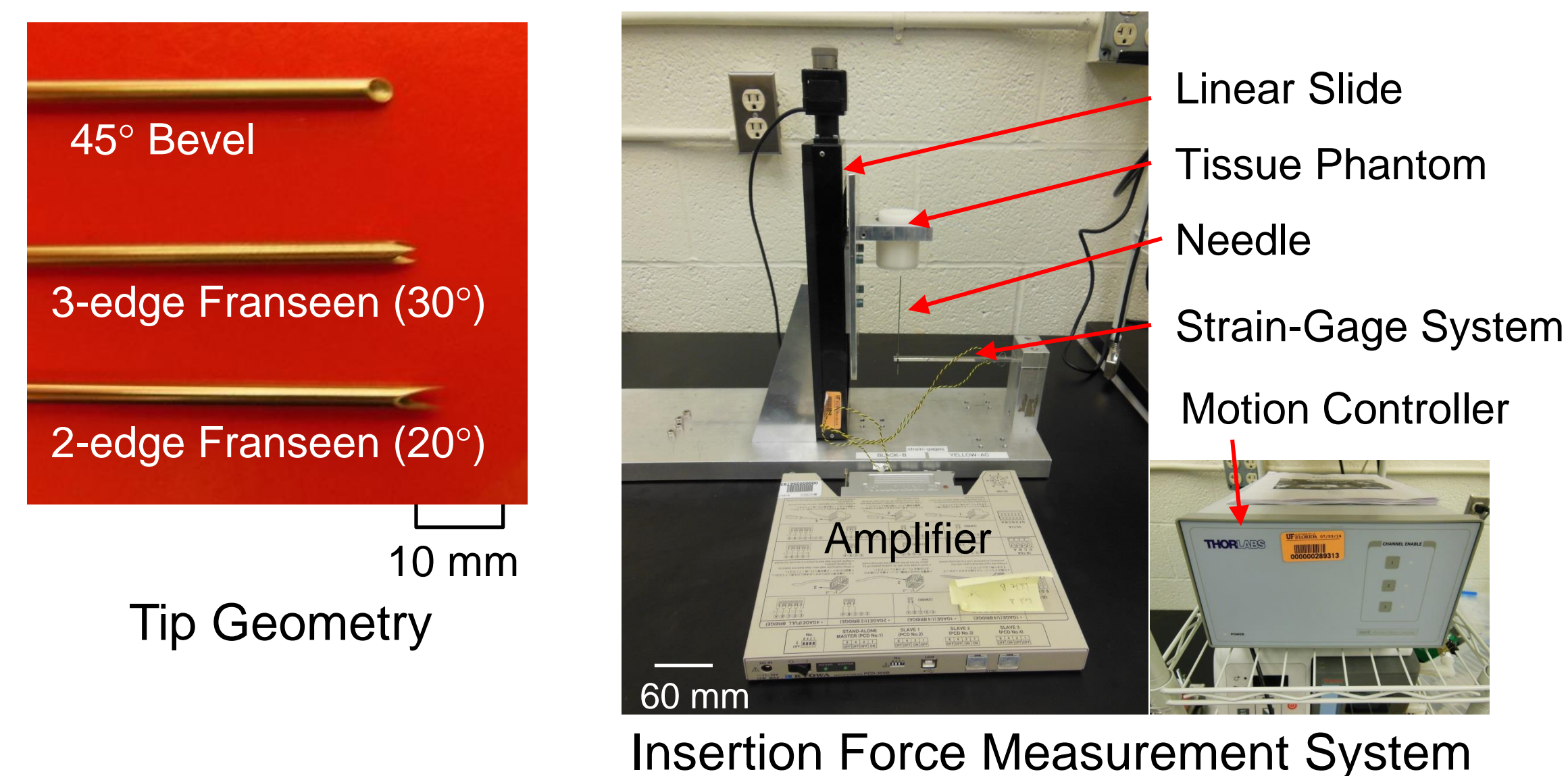
Schematic of New Approach

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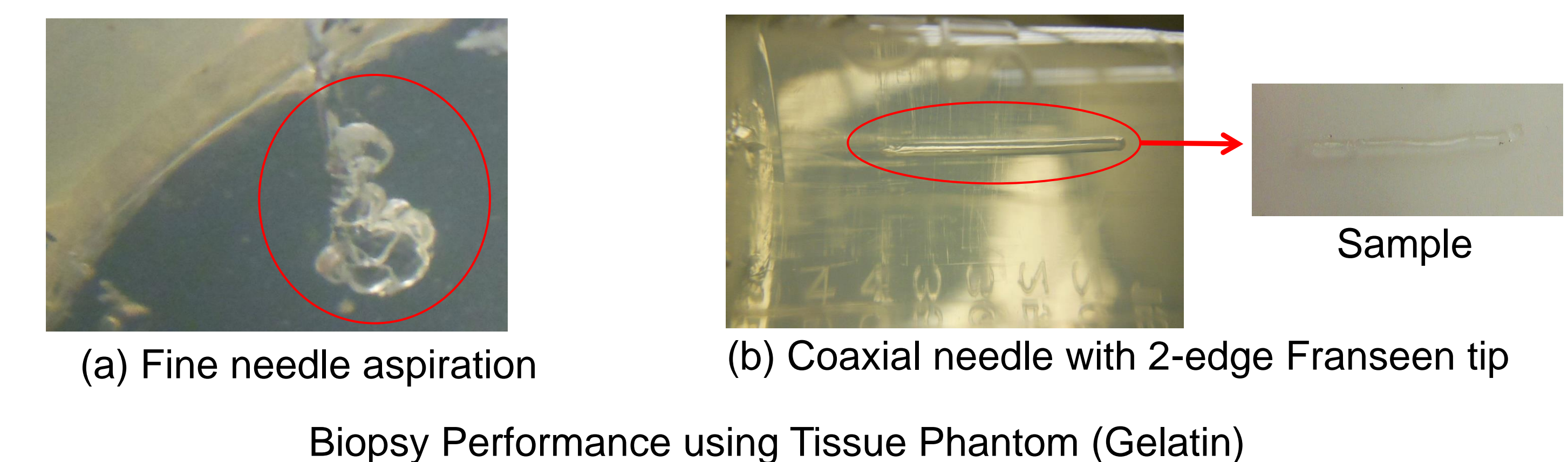
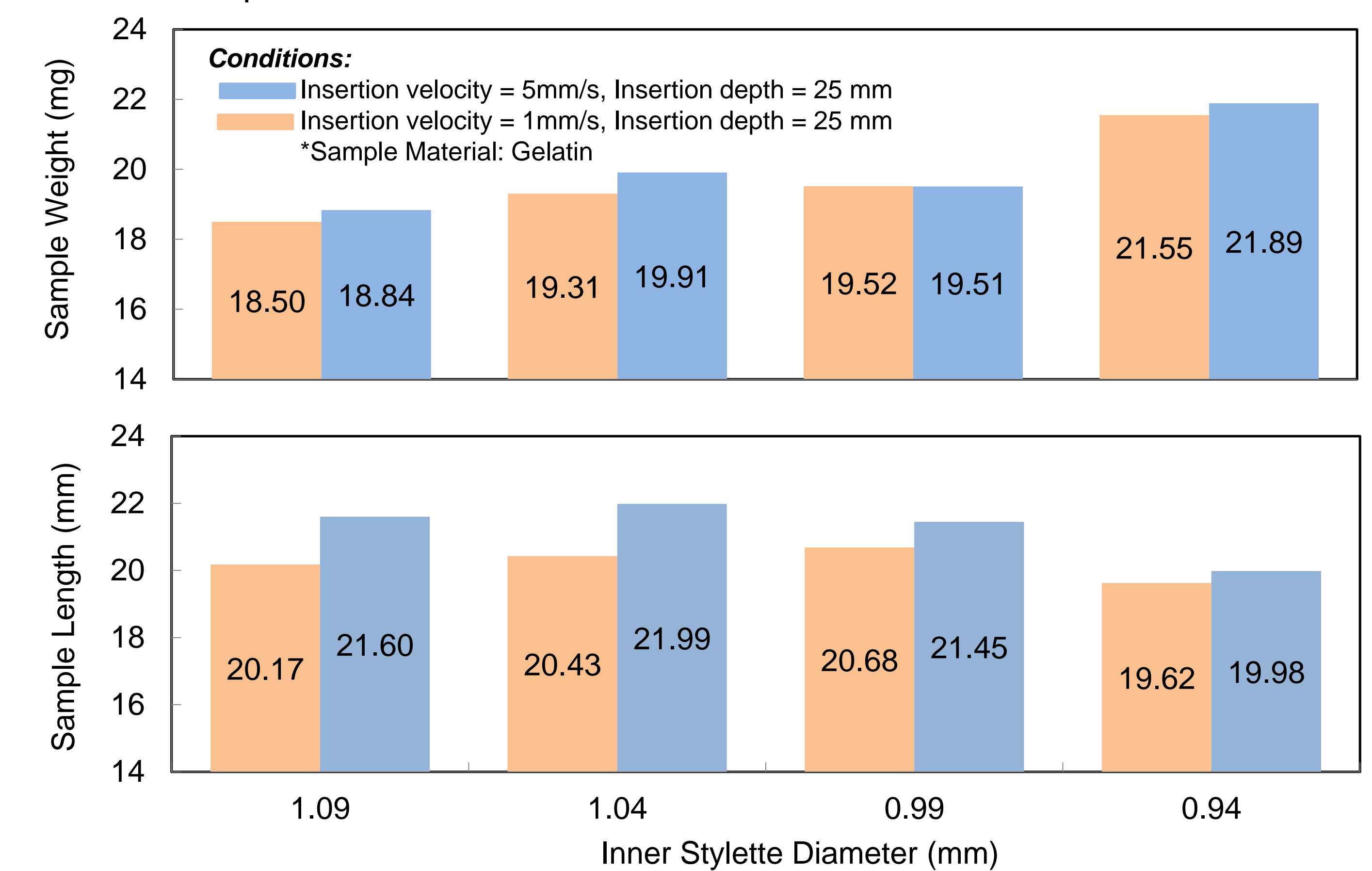
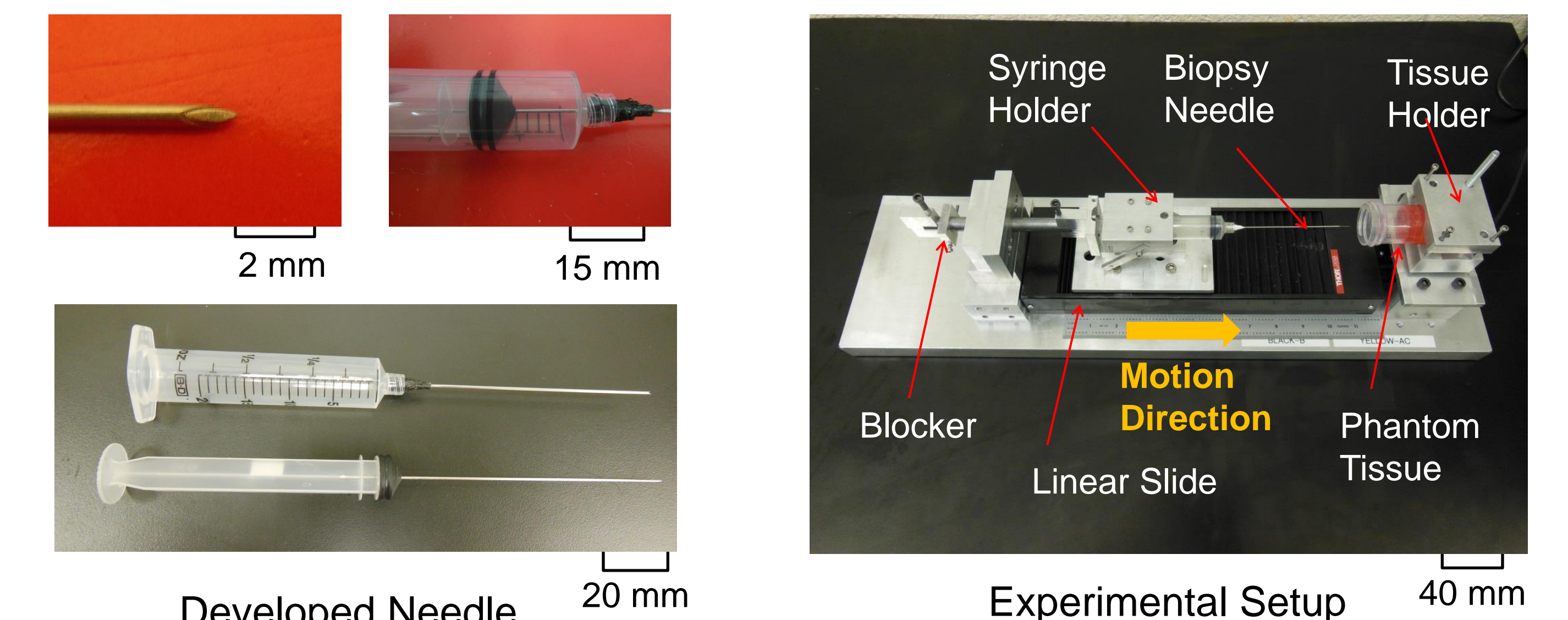
#### ABSTRACT:

Needle biopsy procedures such as fine needle aspiration and core needle biopsy are used to extract tissue samples for diagnosis. Collection of larger samples allows for more accurate diagnosis of cancers. The combination of lower needle insertion force, less needle deflection, and reduced friction between the tissue and needle surface also leads to a more effective biopsy procedure. This project aims to develop a new coaxial needle to extract more tissue with less damage. The experimental study found that the needle tip geometry and the clearance between the inner stylette and outer needle are the key factors affecting the biopsy performance, such as needle insertion force and amount of tissue extracted. Moreover, the developed needle design is applicable for both fine needle aspiration and core needle biopsy procedures. This poster presents the design and manufacture concepts for the needles, evaluation protocol for the needle biopsy, and needle biopsy performance using silicone and gelatin as phantom tissues.

### NEEDLE TIP GEOMETRY AND INSERTION FORCE



### BIOPSY SAMPLING TEST



### CONCLUSIONS

This project developed a new coaxial needle, which enables larger extraction of tissue with less damage. The biopsy performance is influenced by the needle edge geometry and the clearance between the inner stylette and outer needle.

### REFERENCES

National Breast Cancer Centre, 2004, *Breast Fine Needle Aspiration Cytology and Core Biopsy: A Guide for Practice*. Camperdown, NSW, Australia, National Breast Cancer Centre, Chap. 2. ISBN: 1-74127-042-1

### ACKNOWLEDGEMENT

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