

# Dormant leukemia cell detection by biomechanical analysis

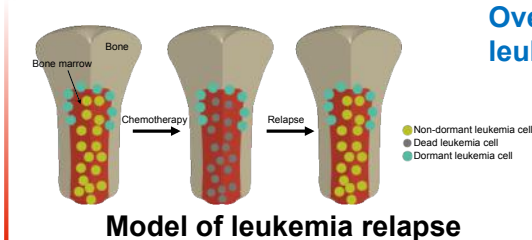
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Host Professor: SMMiL-E

Keywords: Leukemia cell, SNT, AFM, Diagnosis of relapse



## Context



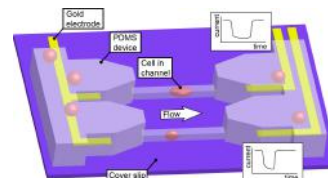
Overall goal: Precise diagnosis method against leukemia disease by biomechanical cell analysis

### Status of consensus problems:

- Relapse of leukemia
- Detection of dormant leukemia cell
- High throughput device for diagnosis

## Objectives

- To find out discriminative parameters between dormant and non-dormant cells
- To develop a biomechanical flow cytometer
- To apply the device for clinical samples

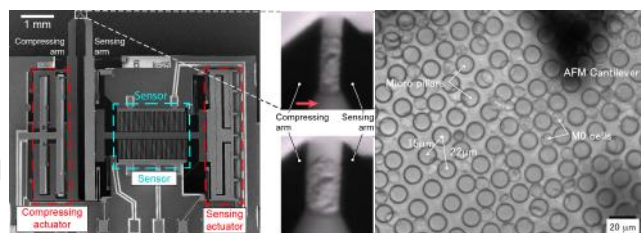


Biomechanical flow cytometer

## Methods

### Discriminative parameters

- 1) Compare leukemia cell line (M0) and dormant cell model (J365)
  - 2) Measure stiffness by SNT and AFM
- Biomechanical flow cytometer
- 1) FEM simulation to optimize design



Measure cellular stiffness by SNT and AFM

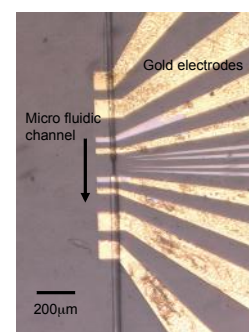
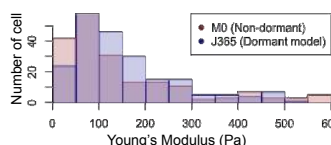
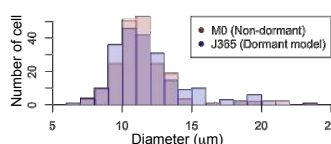
## Results

### Young's Modulus by AFM

Measured M0 and J365  
Diameters of both were similar  
Most of data < 300 Pa

### Biomechanical flow cytometer

Straight channel integrated with gold electrodes for impedance flow cytometer



AFM results and prototype of biomechanical flow cytometer

## Perspectives

- Find out the discriminative parameters by SNT and AFM
- Design a microfluidic device for biomechanical flow cytometer

## Contacts

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