



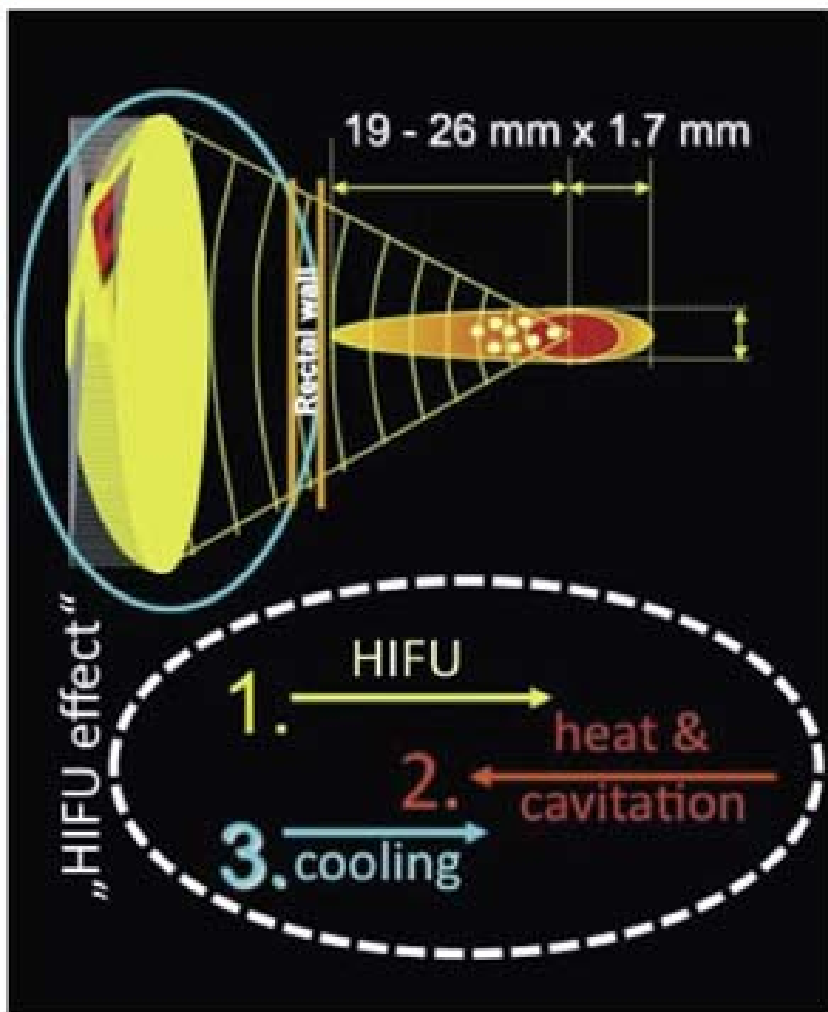
# Cryogenic Focused Ultrasound Therapy Apparatus

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# Physical Principle of HIFU



- Thermal effect
- Cavitation
- Mechanical effect



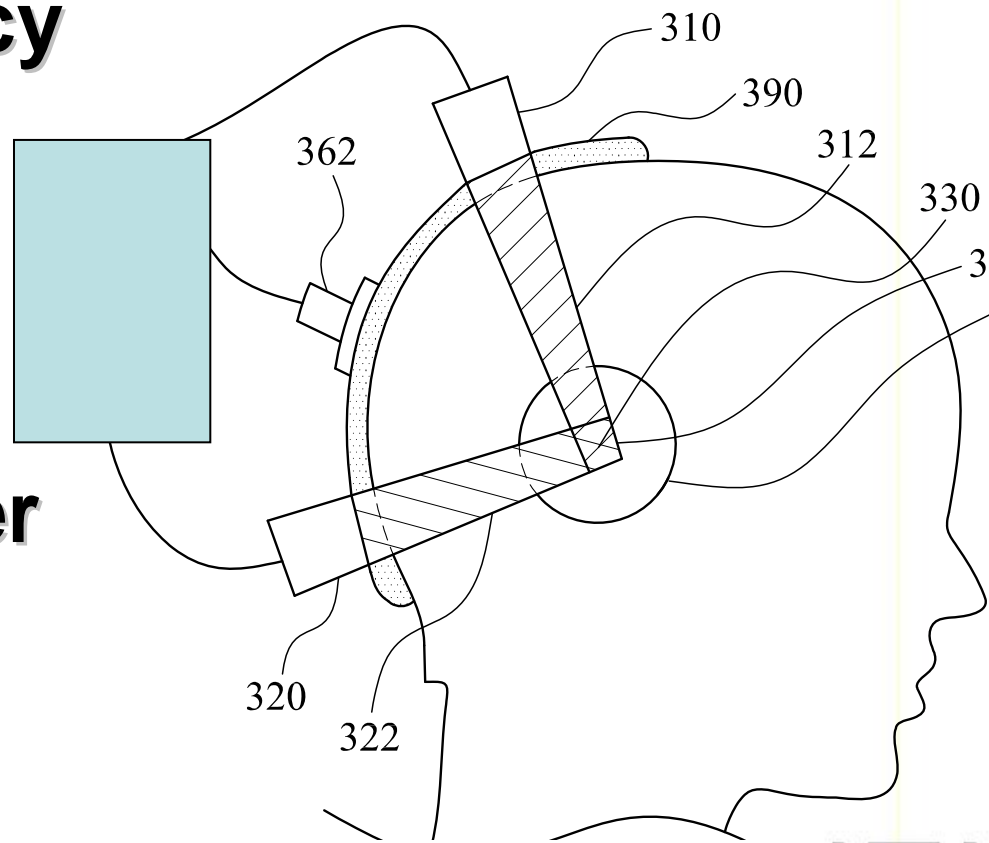
# Disadvantage of Traditional HIFU

- **Restriction of Treatment**
- **Damage of Thermal Effect to Normal Tissue**
- **Traveling Path of the Ultrasonic Causes Tissue Damage**



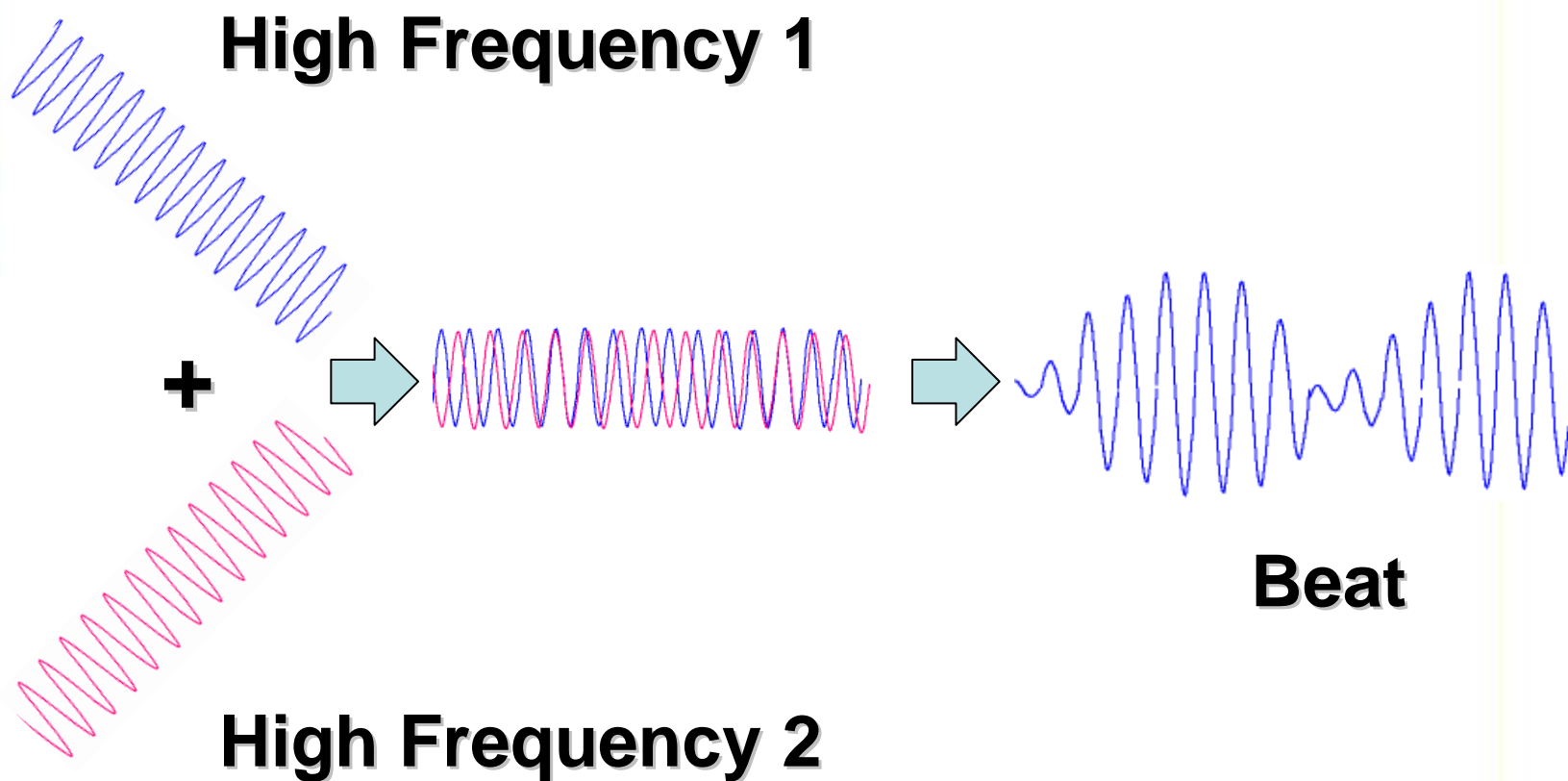
# Cryogenic Focused Ultrasound Apparatus

- **Beat Frequency**
- **Resonance**
- **Doppler Cooler System**



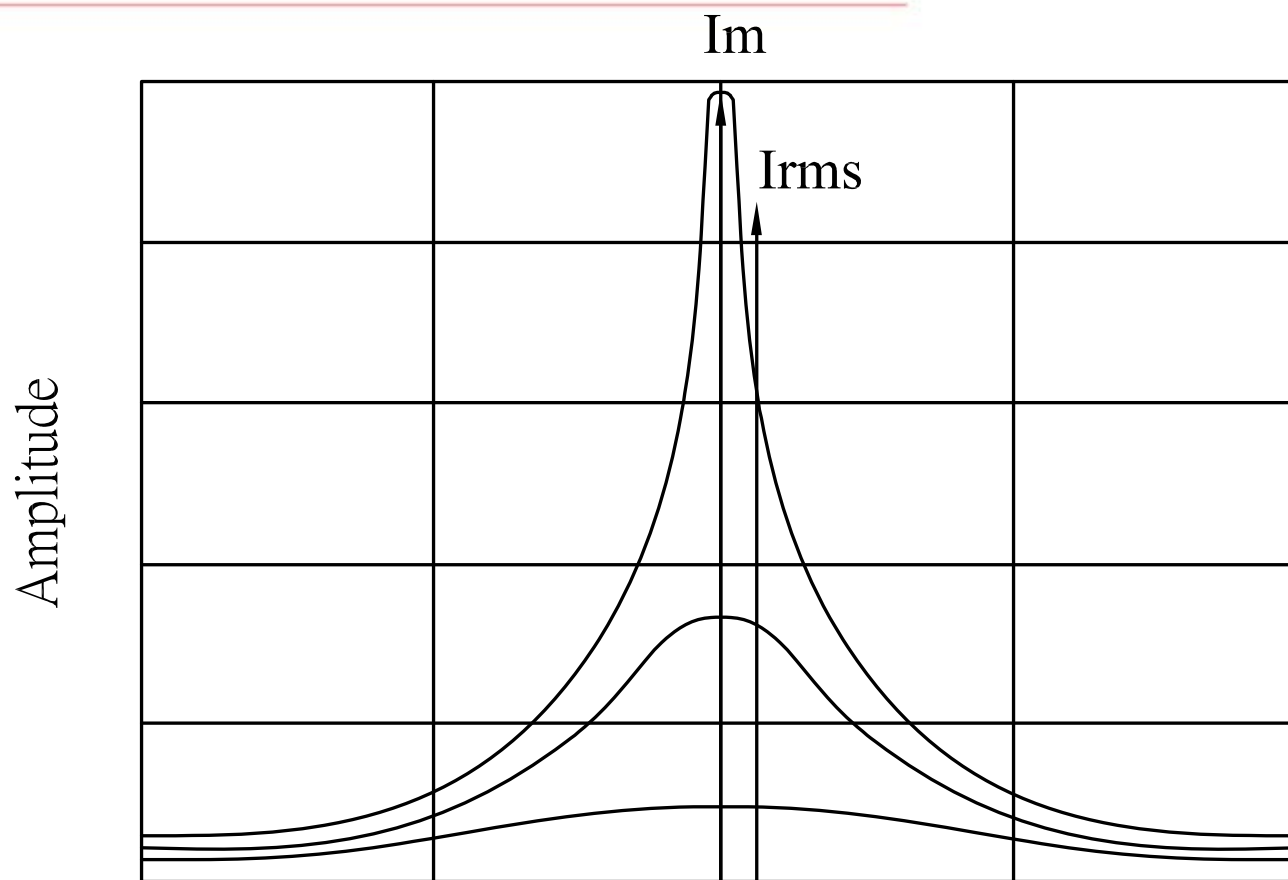


# Beat Frequency





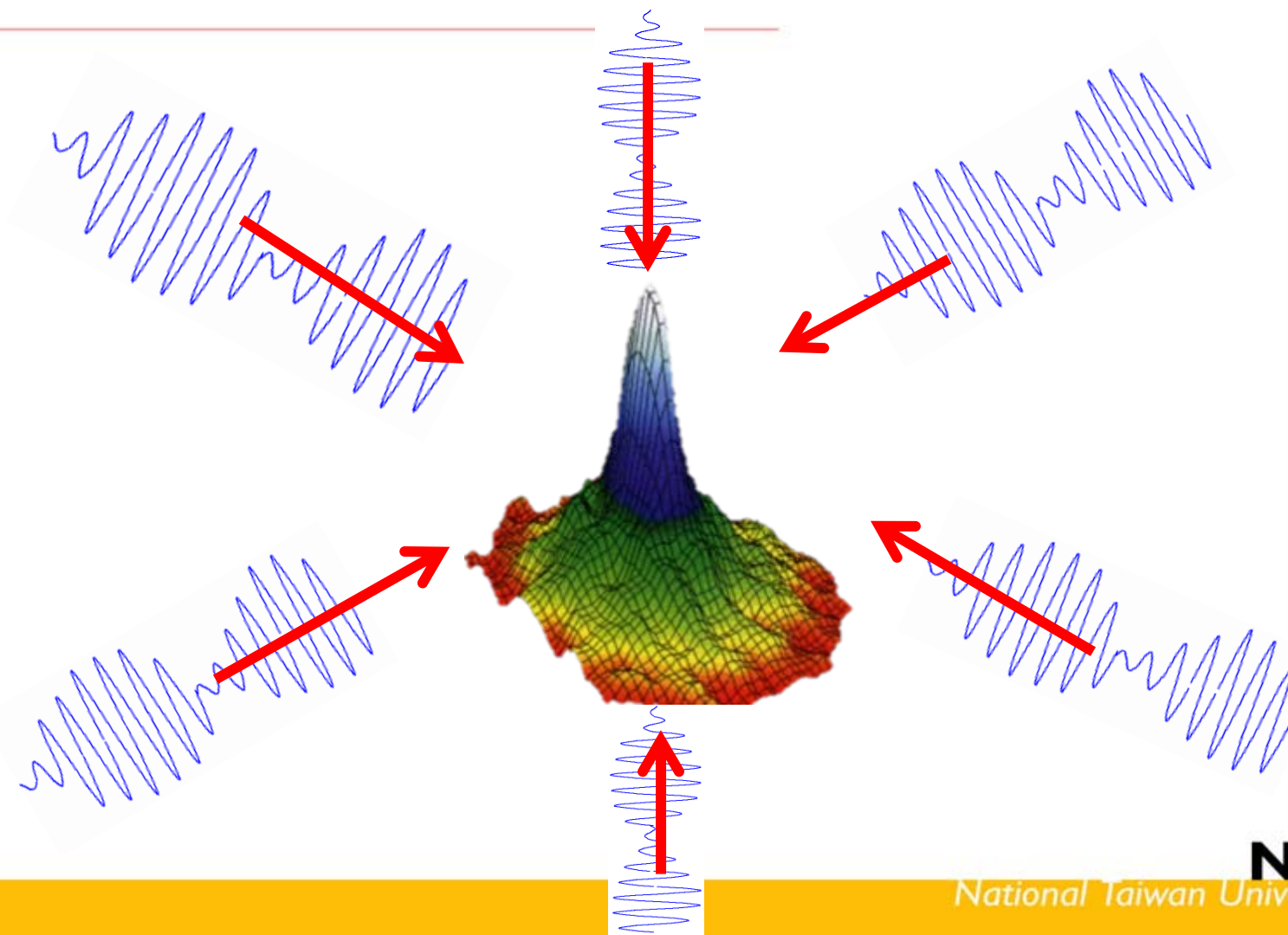
# Resonance







# Doppler Cooling System





# Advantage of Our Apparatus

- **Using Beat Frequency to Avoid Cavitation Damage**
- **Avoid Thermal Damage to Normal Tissue**
- **To Overcome the Limitations of Treatment like Brain Tumors**





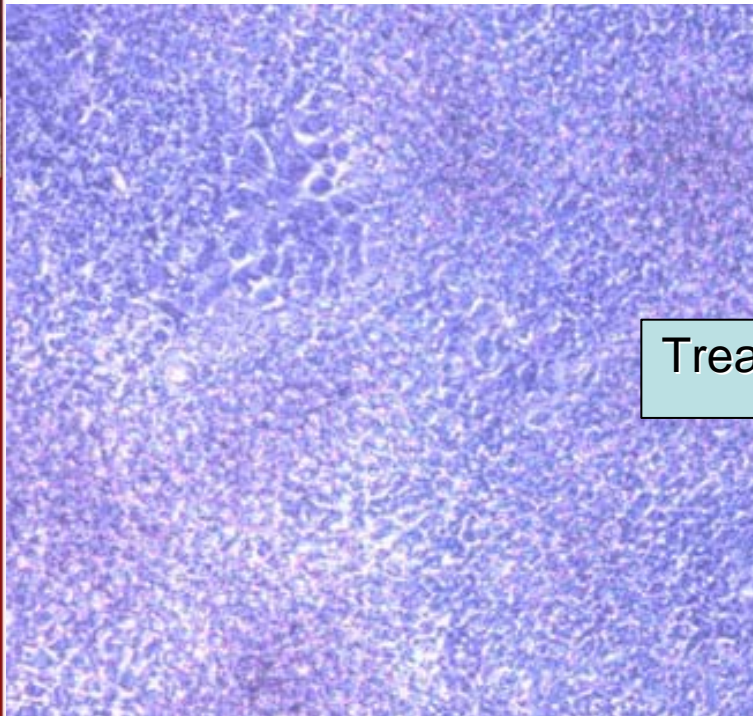
# Current Progress

- Experiment:  
Cancer Tissue & Cell Test
- IP:
  1. US Patent Application NO.: 14/306,235
  2. US Patent Application NO.: 14/013,997
  3. TW Patent Application NO.: 102145633
  4. TW Patent Application NO.: 103113449

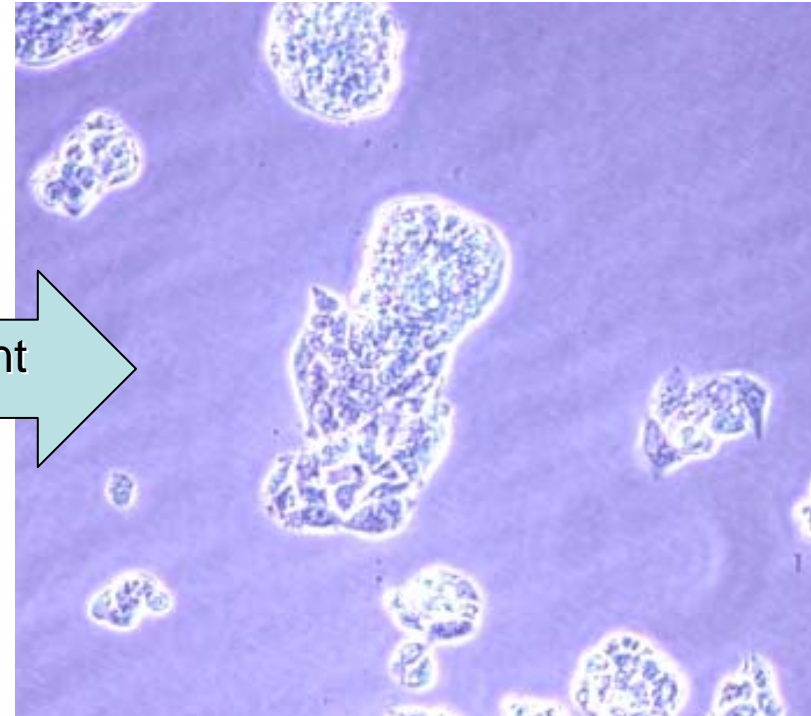


# Cancer Cell Treatment

BEFORE



AFTER



Treatment

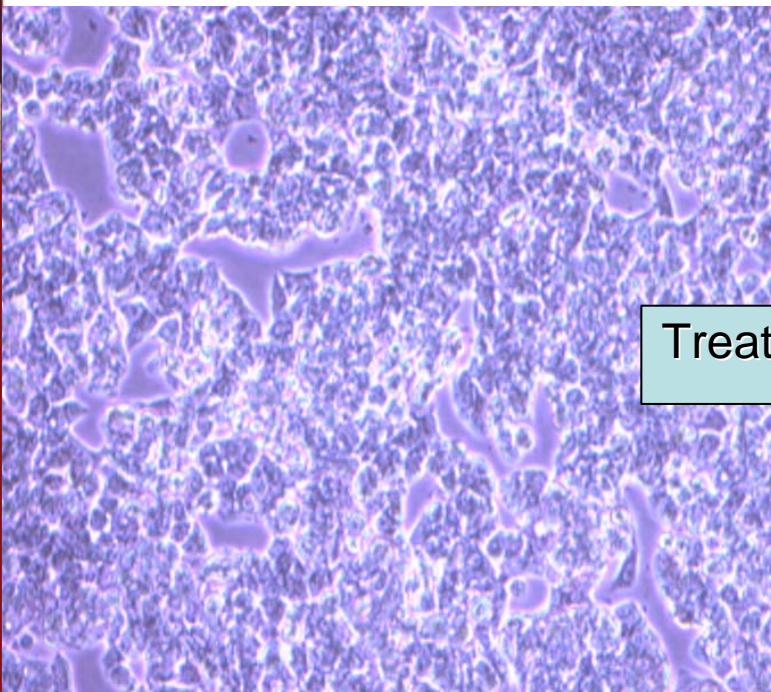




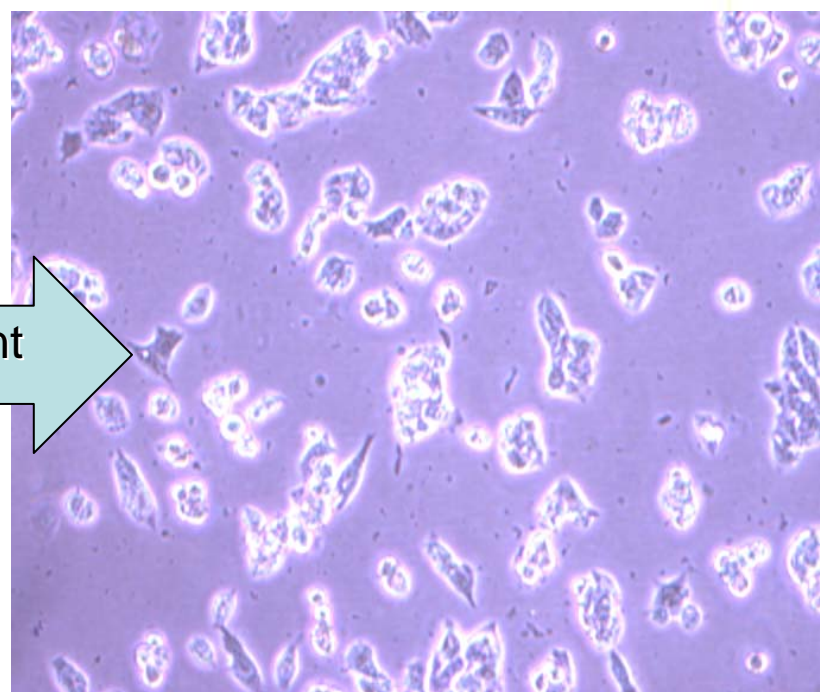
# Cancer Cell Treatment

BEFORE

AFTER



Treatment

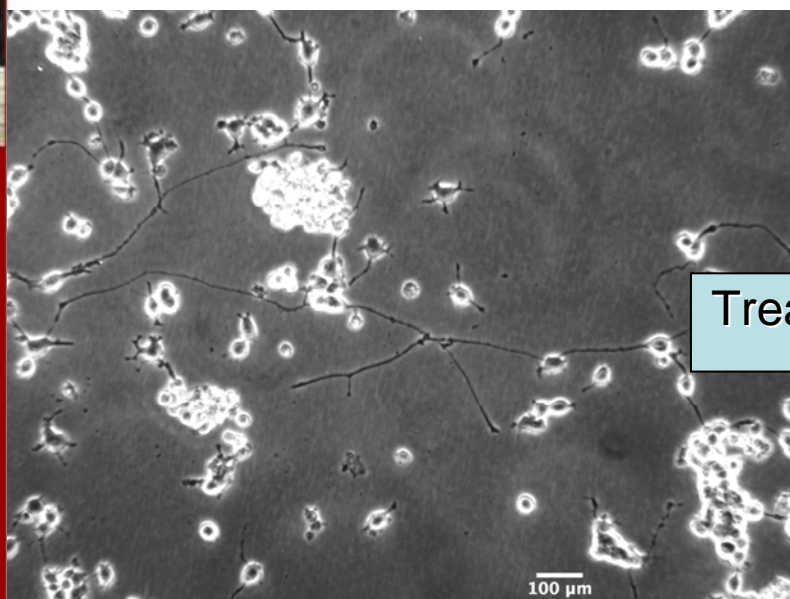




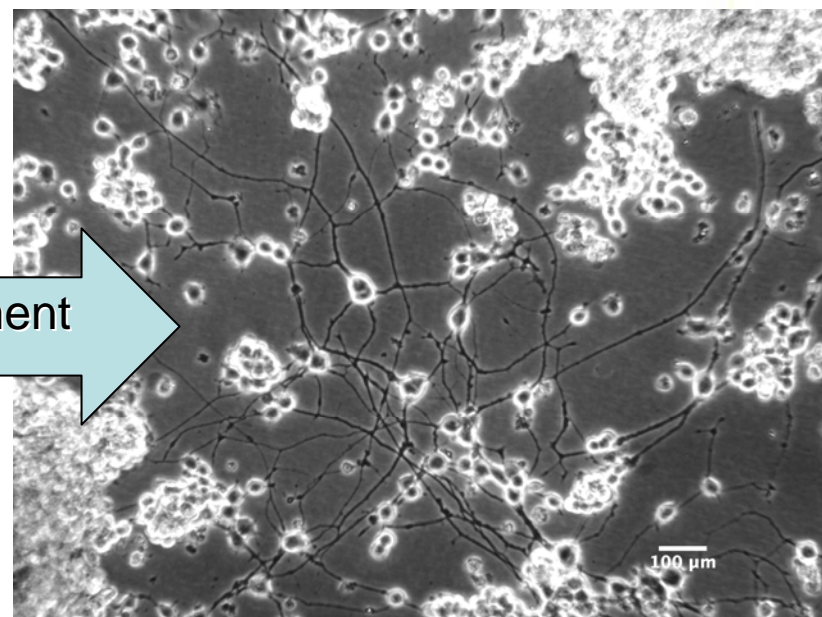
# Stimulated neuron differentiation

BEFORE

AFTER



Treatment







# Future Work: Brain Treatment

