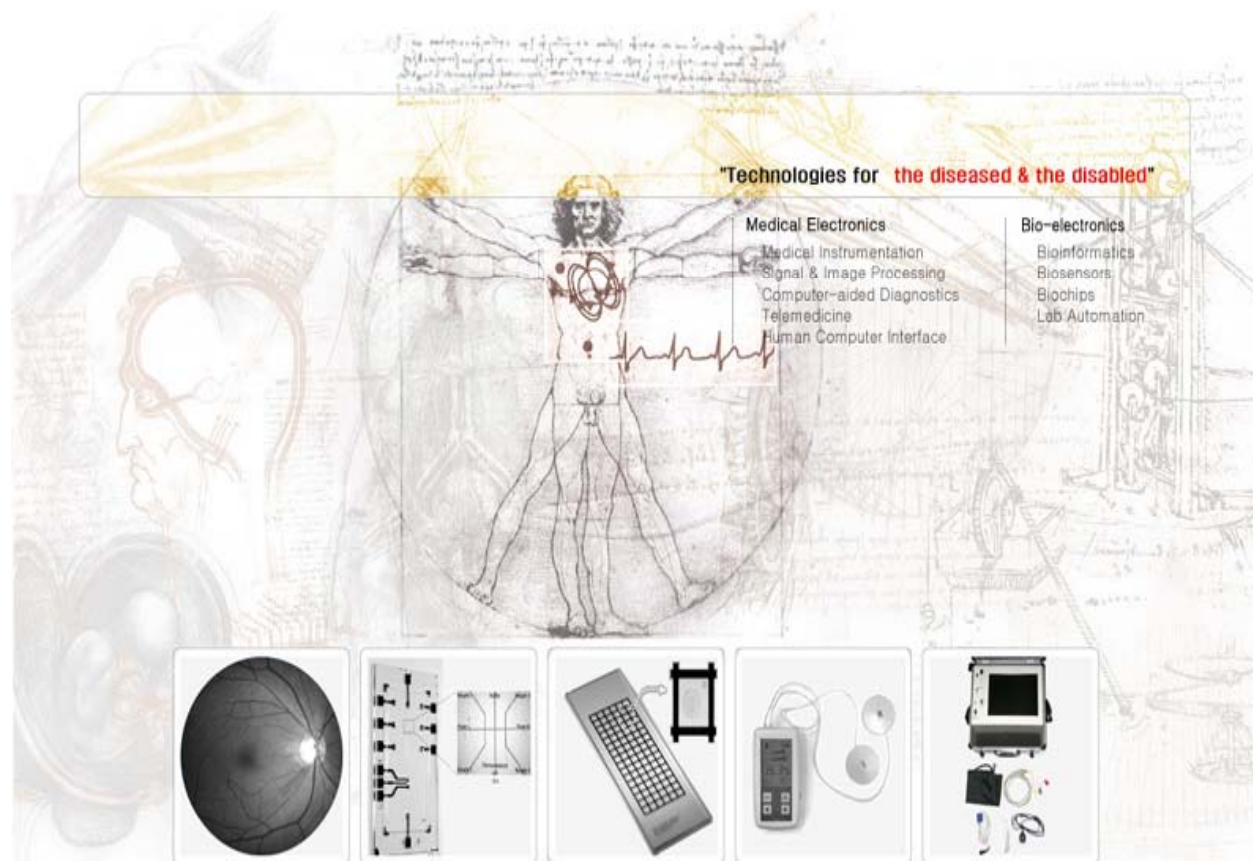
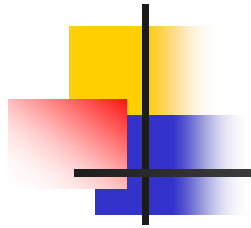


# Introduction to Biomedical Engineering



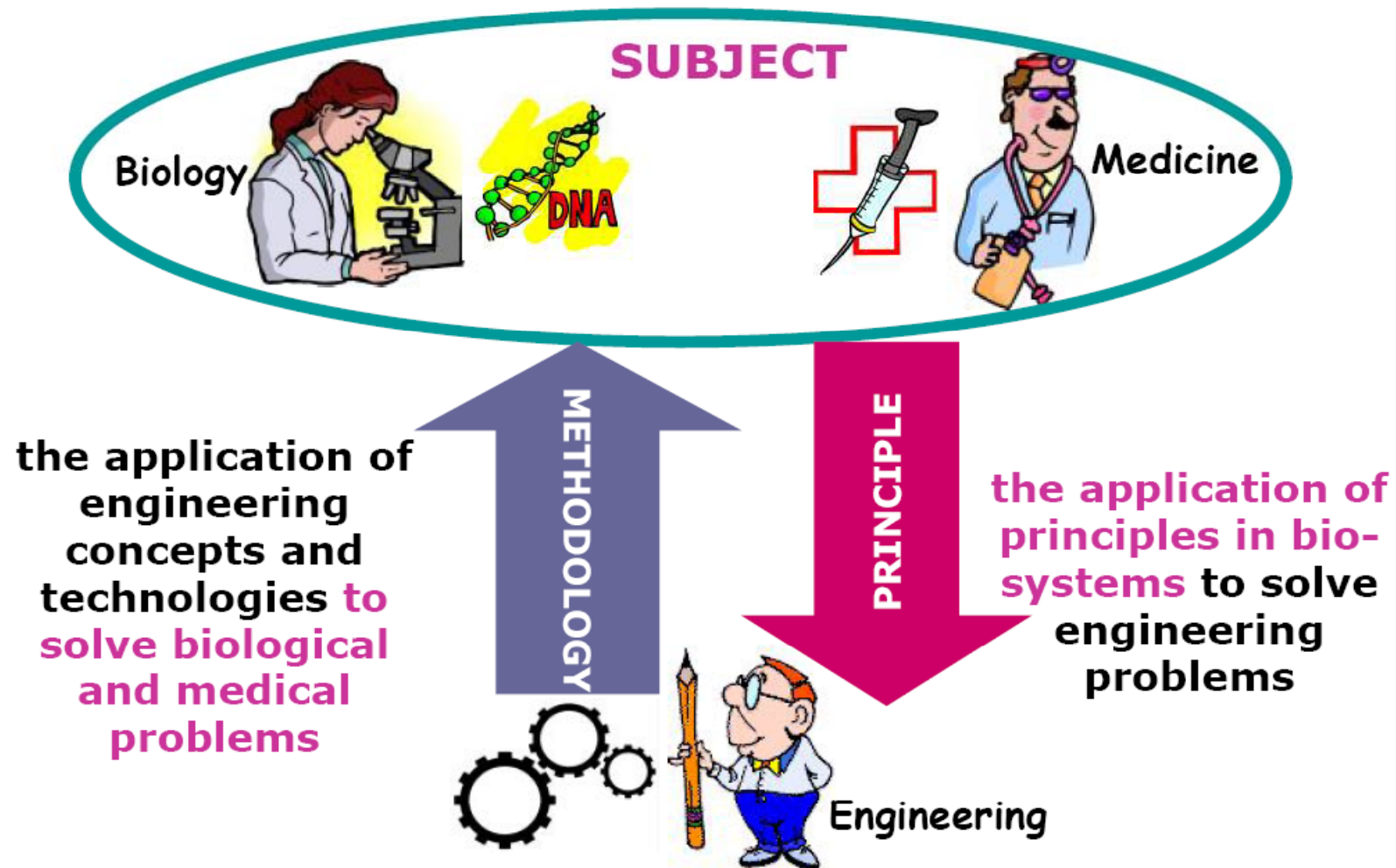


# Index

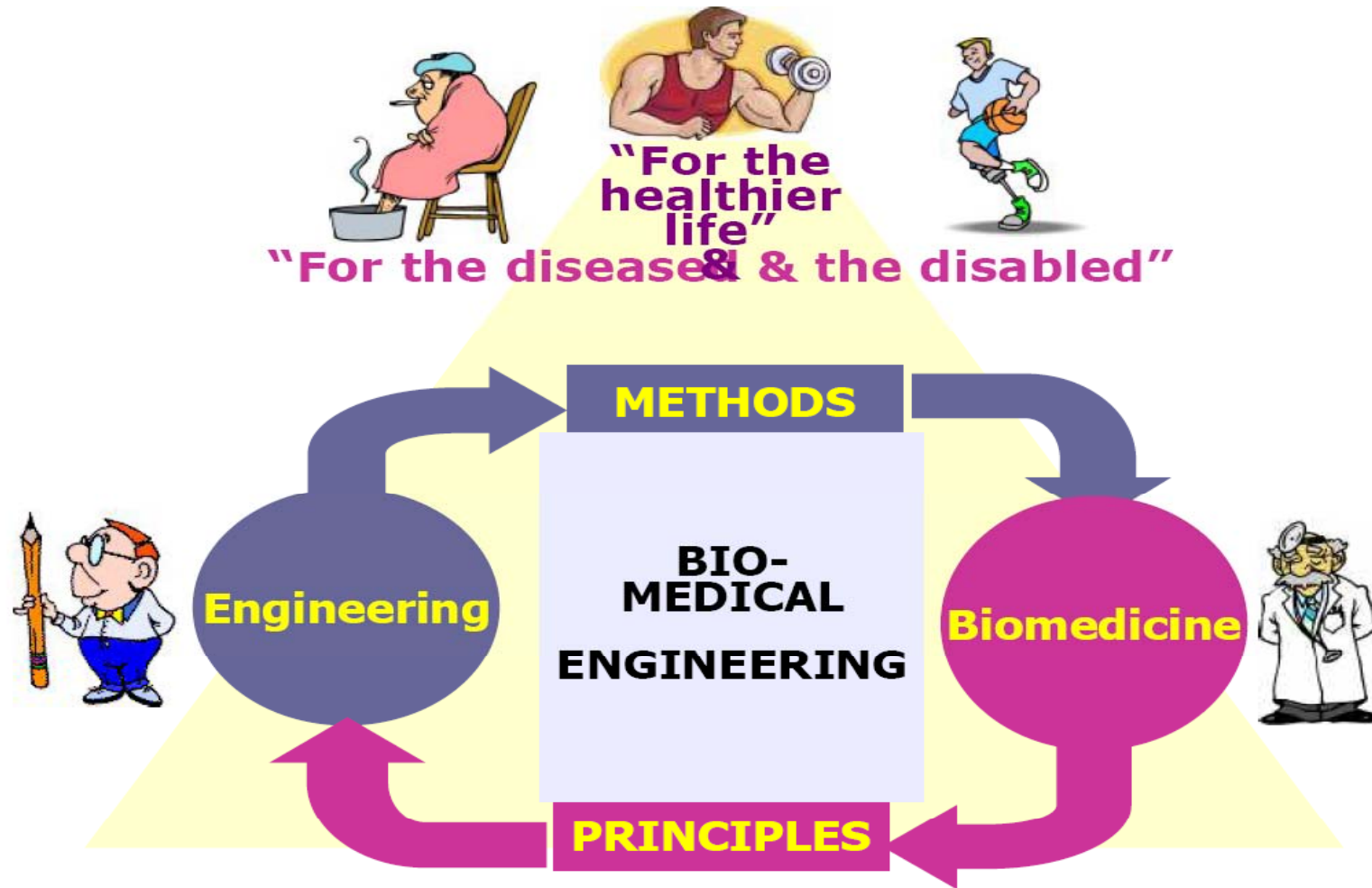
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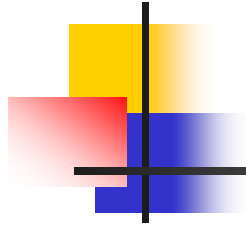
- **Definition & Identity**
- **Applications**

# Biomedical Engineering



# Biomedical Engineering





# 의공학의 표기

---

- Biomedical Engineering
- Medical & Biological Engineering
- Medical Engineering
- Bioengineering
- 의 공 학
- 의용생체공학
- 의학공학, 의용공학
- 생체공학



# 각 학문 분야와 관련 내용

## 공학분야

전기전자공학

정보공학

기계공학

화학공학

전산공학

제어공학

통신공학

금속공학

재료공학

섬유공학

원자핵공학

## 의공학의 세부분야

medical instrumentation, signal processing,  
medical imaging

medical informatics

biomechanics, hemodynamics, artificial organs,  
rehabilitation engineering

biochemistry, cell engineering, clinical laboratory

computer application in medicine, artificial  
intelligence, information system

biofeedback, biological simulation

medical networks, telemedicine

biomaterial(hard tissue)

biomaterial(soft tissue)

biopolymer

nuclear medicine, magnetic resonance technique

(big data)

# Bridge over 'Troubled Water'...

Biomedical  
Engineering



Engineering



mathematics



physics

**DEDUCTION**

Biological & Medical  
Science



chemistry

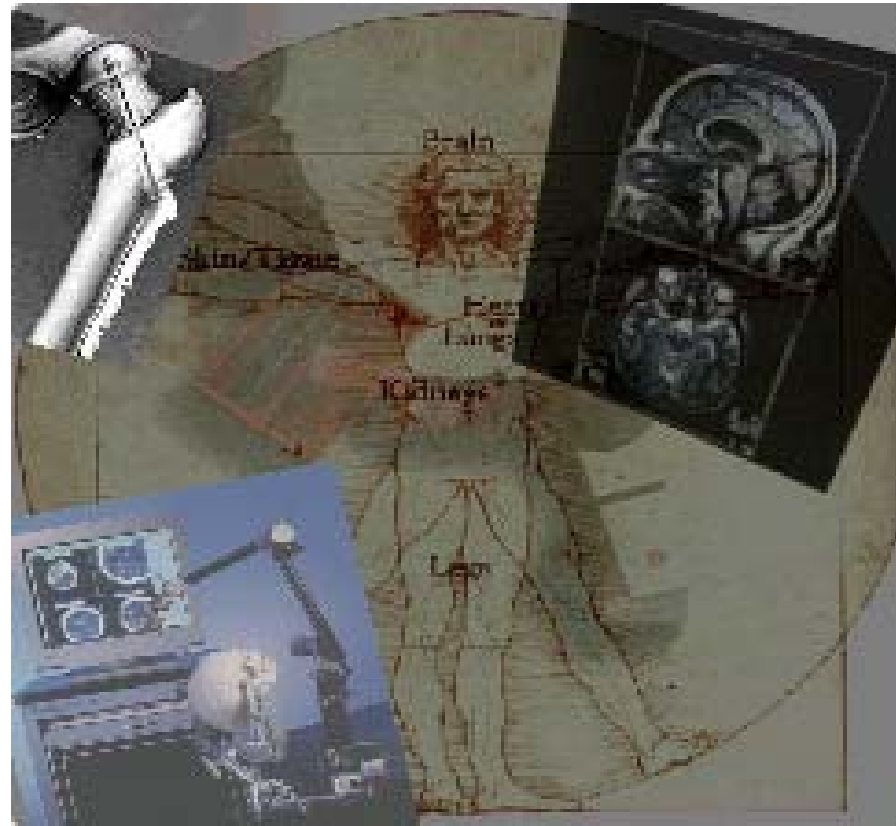


biology

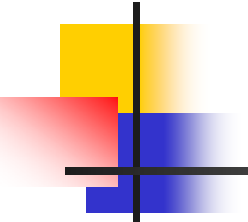
**INDUCTION**



# ■ Applications







**"Science studies what is;  
Engineering creates what  
never was."**

*- Theodore van Karman -*

# BME in the Medical Arena



Helping you make a difference



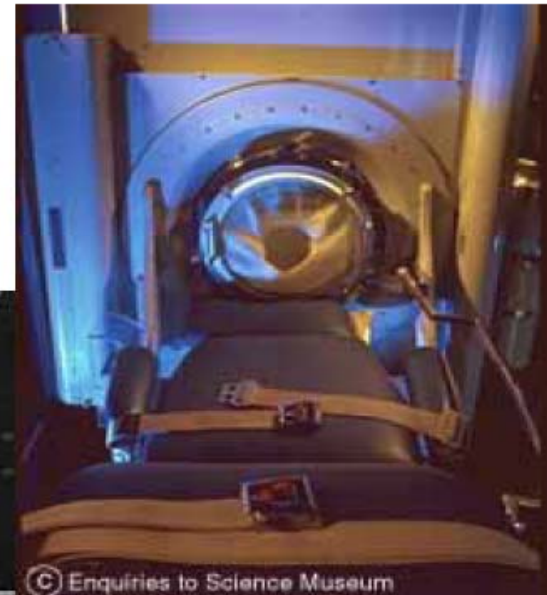
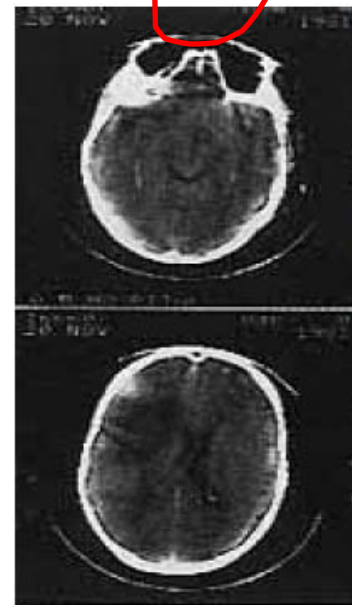
# Cormack and Hounsfield



Sir Godfrey N. Hounsfield, UK  
Central Research Laboratories,  
EMI, London, UK  
1919 -



Allan M. Cormack  
USA  
Tufts University  
Medford, MA, USA  
1924 - 1998



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**The Nobel Prize in Physiology or Medicine 1979**  
**"for the development of computer assisted tomography"**



# The 2003 Nobel Prize in Physiology or Medicine

6 October 2003

The Nobel Assembly at Karolinska Institutet has today decided to award The Nobel Prize in Physiology or Medicine for 2003 jointly to

**Paul C Lauterbur and Peter Mansfield**

for their discoveries concerning "**magnetic resonance imaging**"



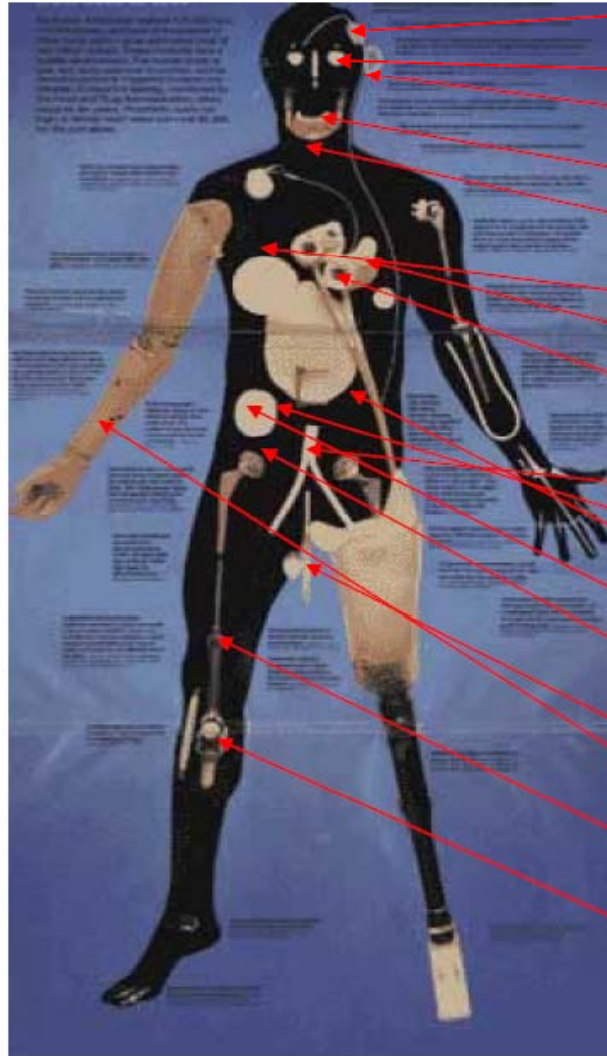
**Paul C. Lauterbur**  
Professor of  
Chemistry,  
Univ. of Illinois



**Sir Peter Mansfield,**  
Professor of Physics,  
Univ. of Nottingham



# Artificial Internal Organs



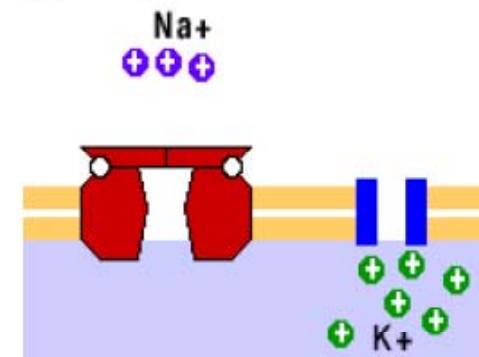
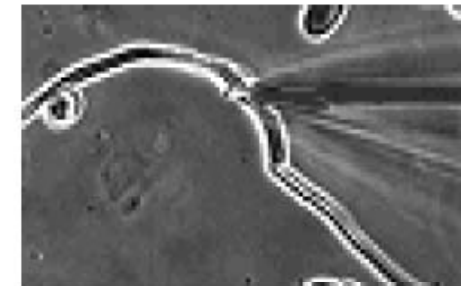
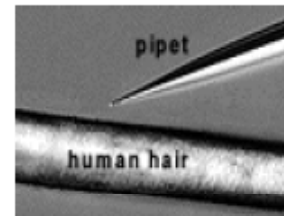
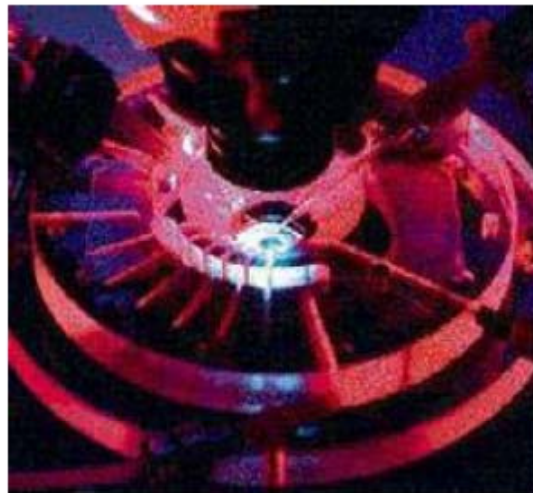
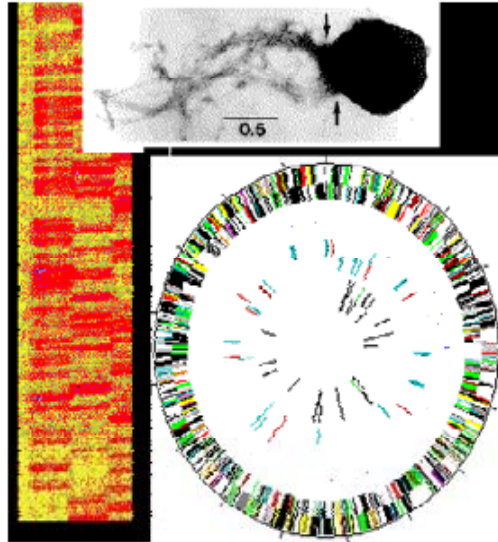
- Artificial brain
- Artificial eye
- Artificial ear
- Artificial tooth
- Artificial larynx
- Artificial breast
- Artificial heart
- Artificial heart valve
- Artificial blood vessel
- Artificial liver
- Artificial pancreas
- Artificial kidney
- Artificial bladder
- Artificial penis
- Artificial arm
- Artificial leg
- Artificial joints

**"I am looking forward to returning to a normal life"**

**Robert Tools, world's first recipient of the  
AbioCor Implantable Replacement Heart. (July, 2001)**

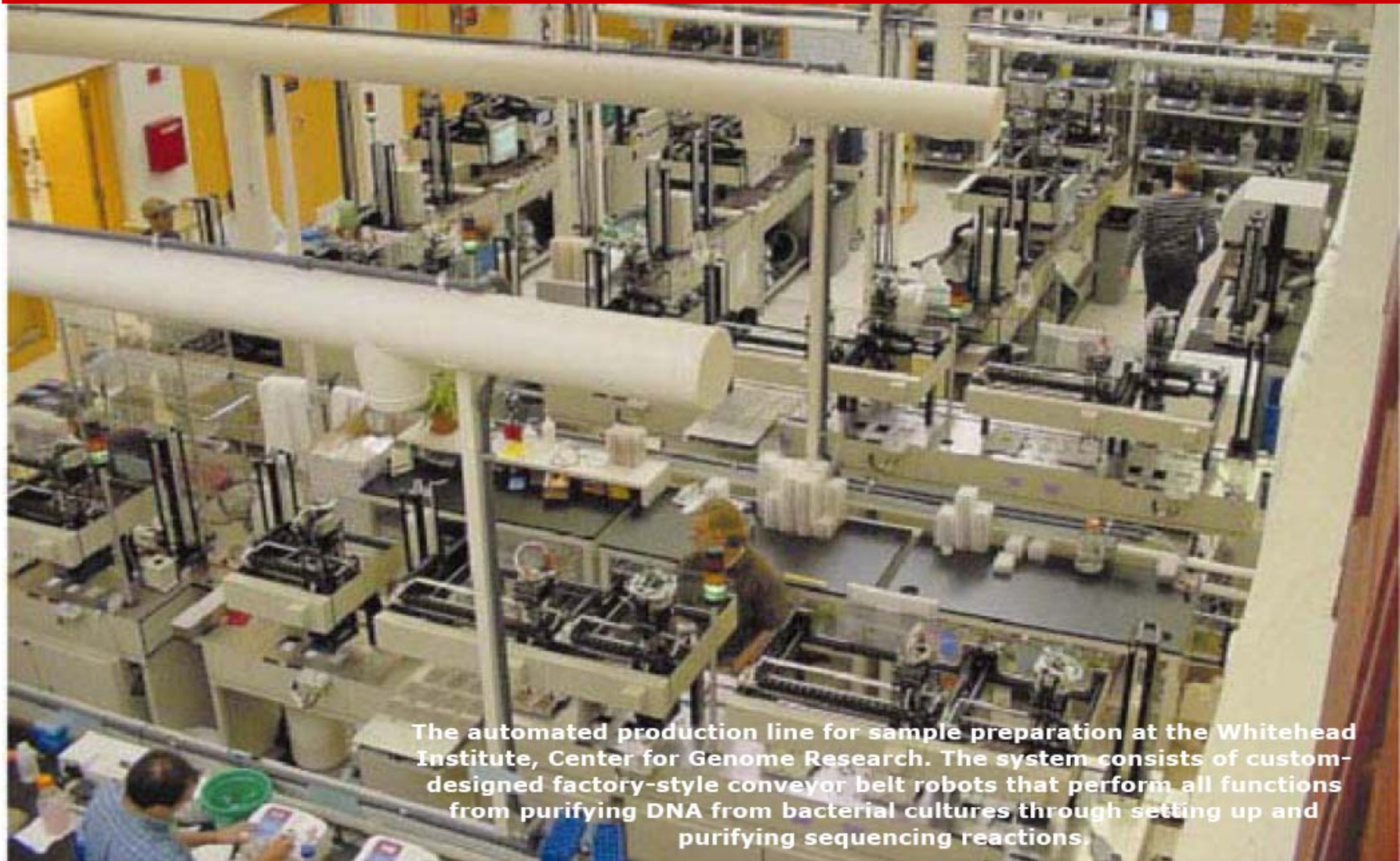


# BME in the Biological Arena

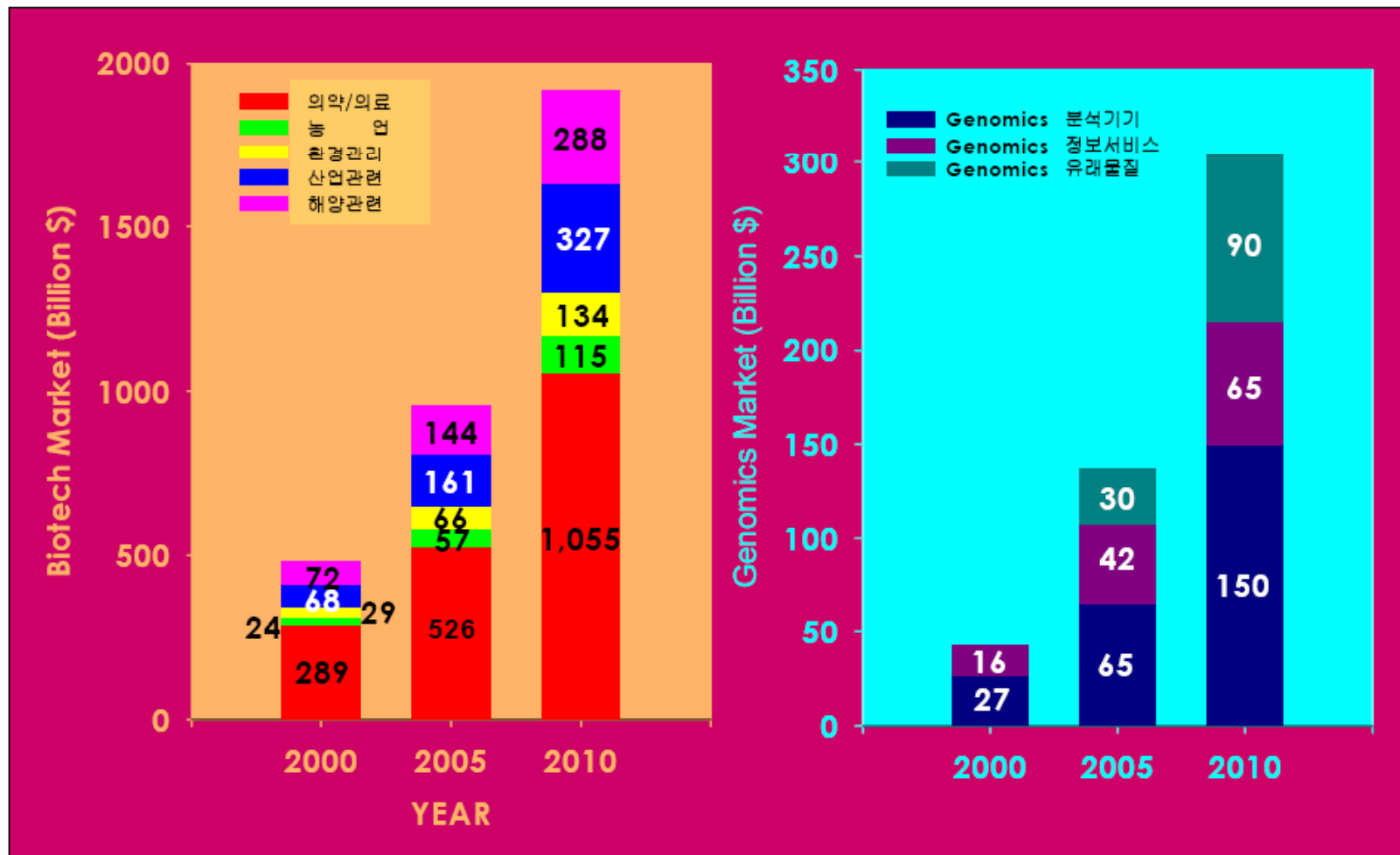




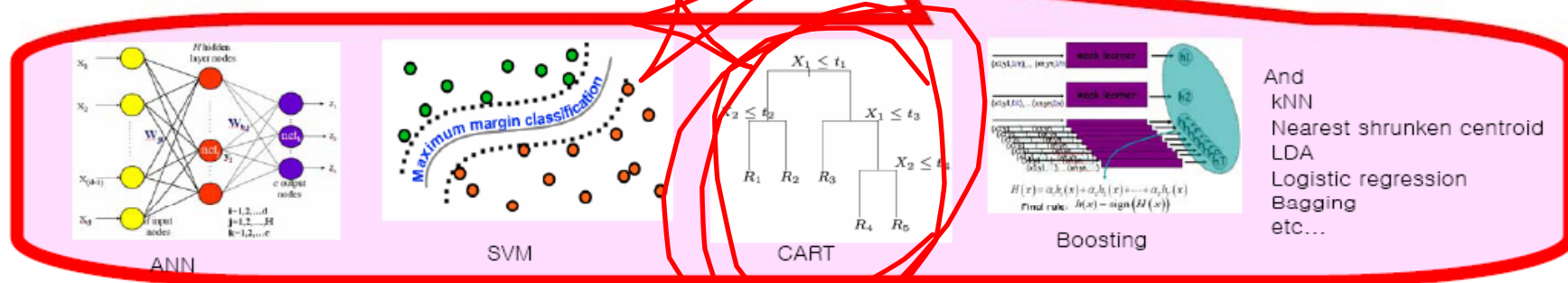
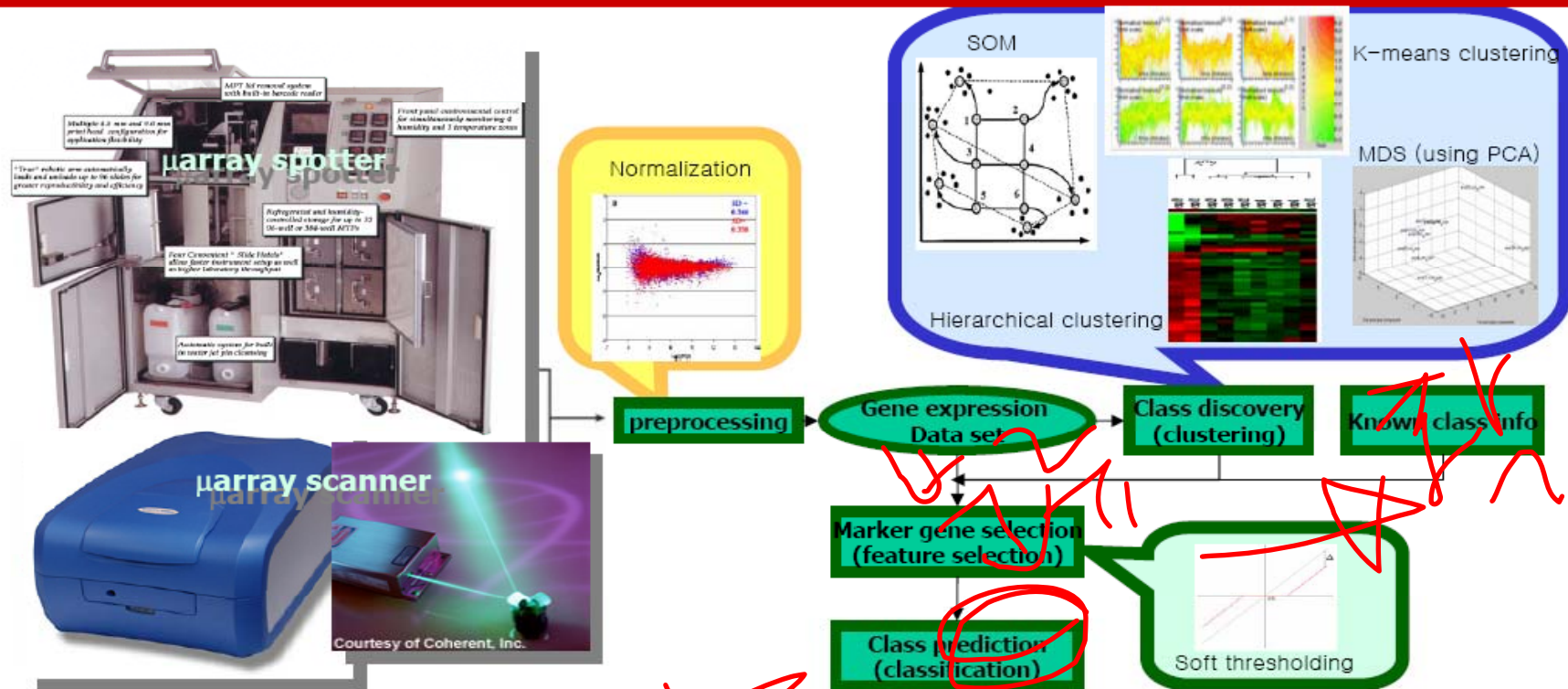
# Genomics & Instrumentation



# Genomics & Instruments

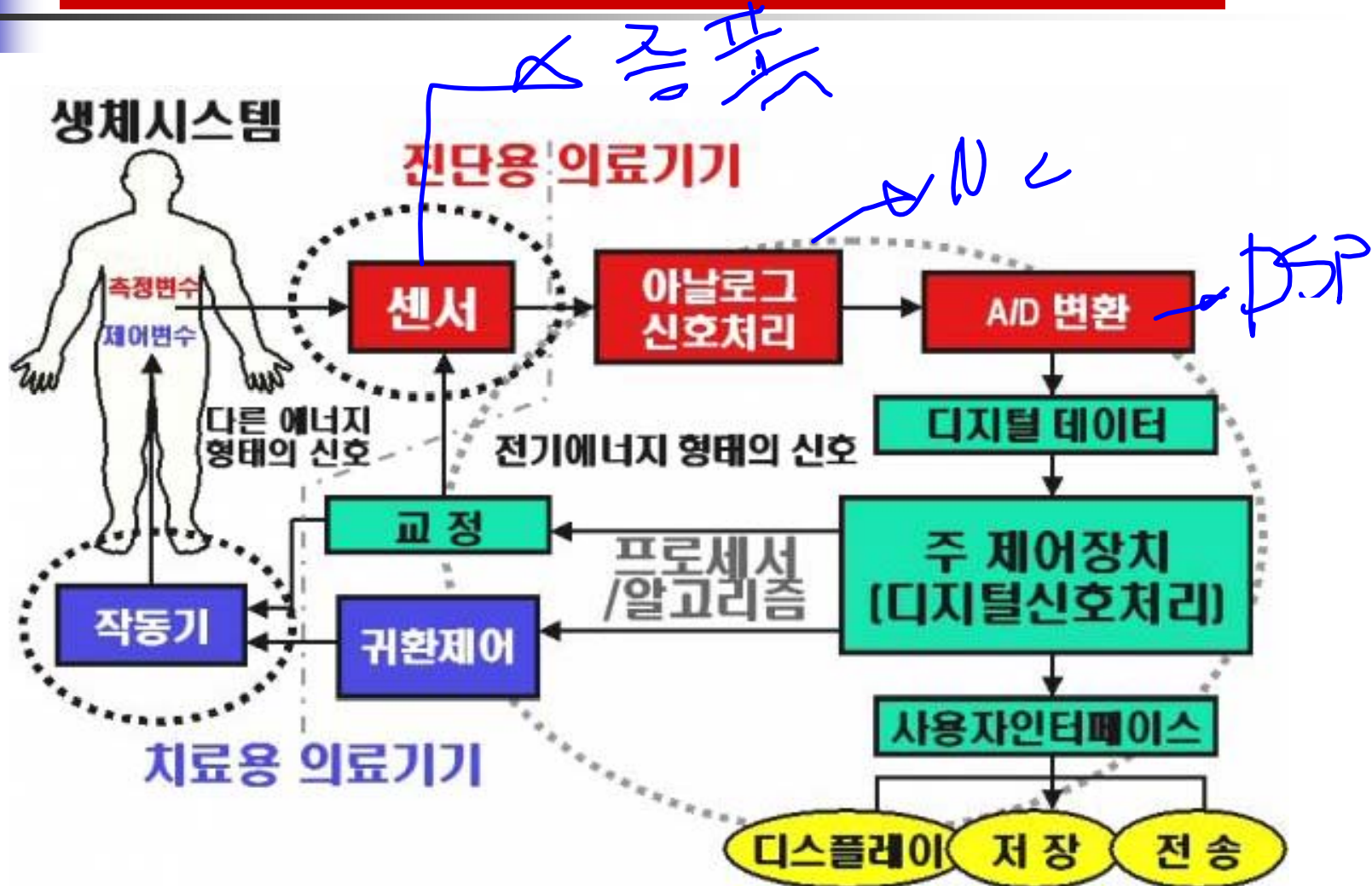


# Bioinformatics & Instruments

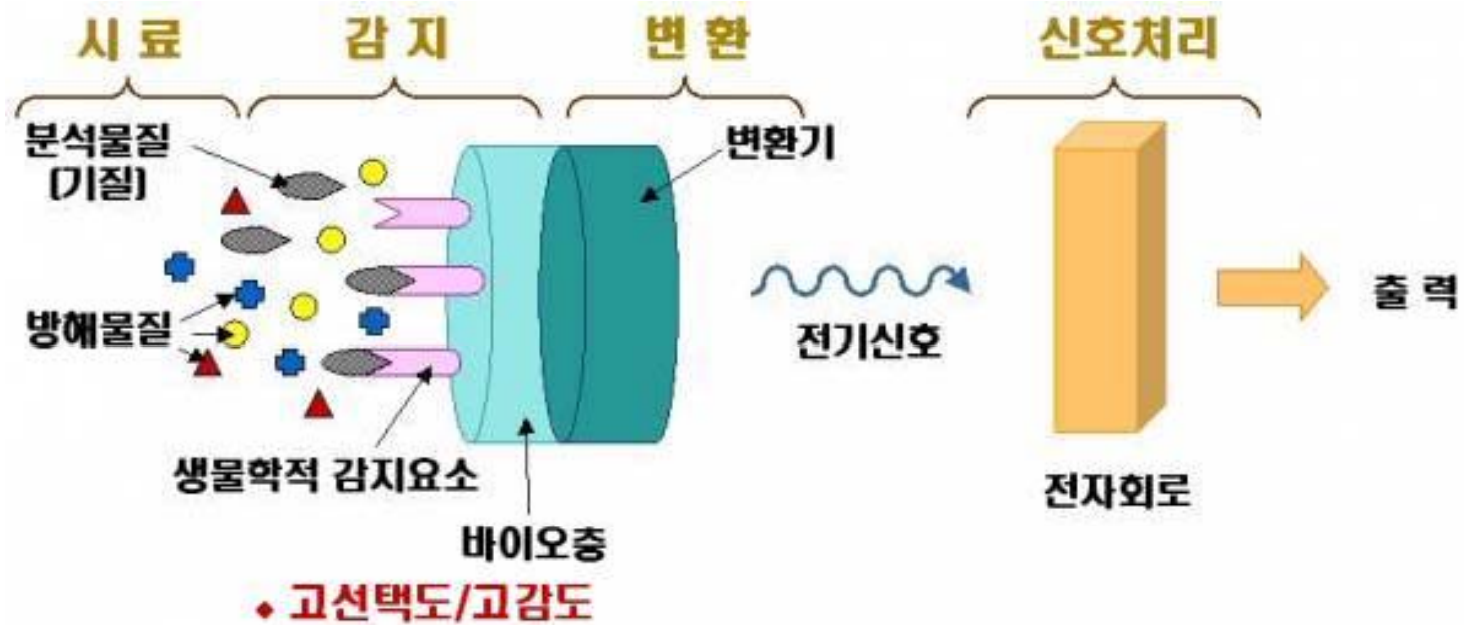




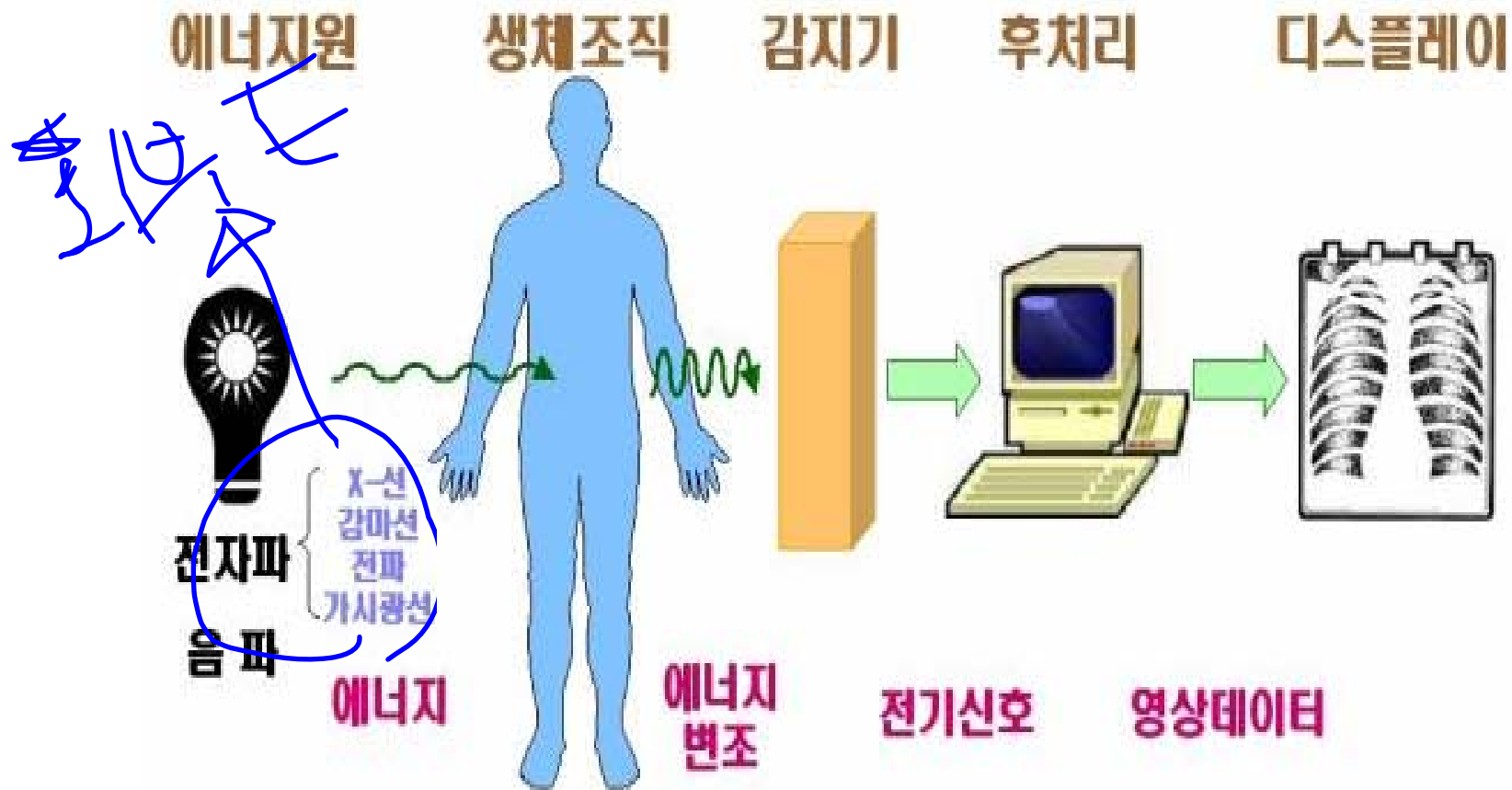
# Bioinformatics & Instruments



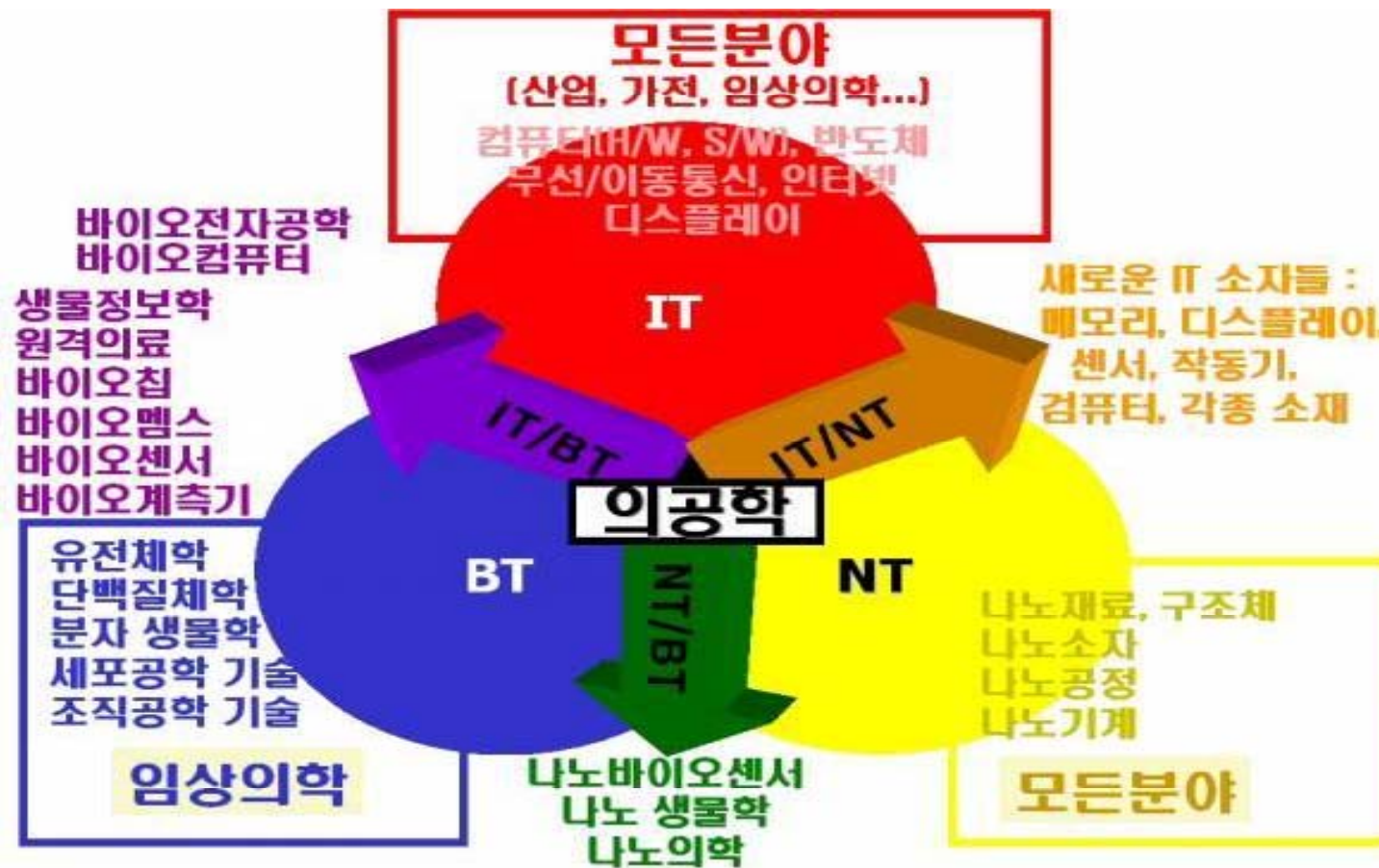
# Bio Sensor



# Medical Imaging



# Biomedical Engineering and IT/BT/NT Fusion Technology





## 예) 나노바이오 기술

- 나노바이오 센서
- 나노바이오 로봇

