

# Pacemakers and Implantable Cardiac Defibrillators: Are they really secure ?



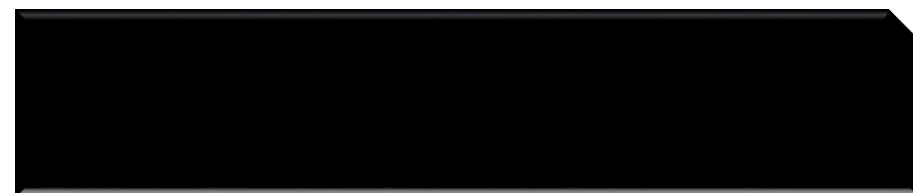
## Attacks



→ Antenna

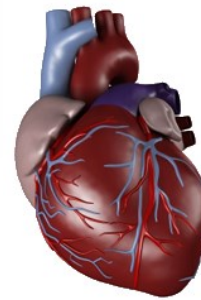


~10 cm



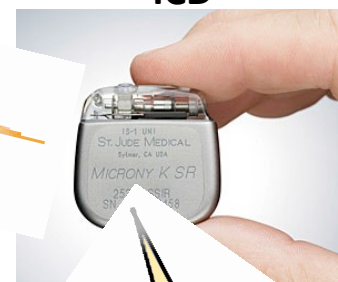
6. Turn off therapies ⚠

7. Affect patient's physiology ⚠



↑ regulate

ICD



control



Device Programmer

## Defense



Solutions ?



Problems



Prototypes defenses VS some of the attacks

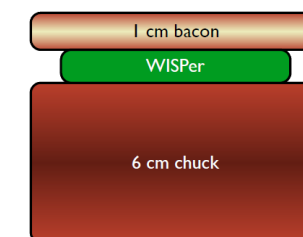


Example of prototype : **WISP** = RFID + computation  
**WISPer** = WISP + code

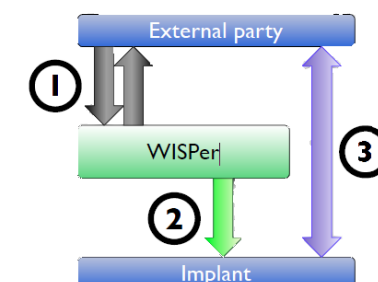
The WISP



Experimentation : acoustic notification for the patient



The Solution



- 1: External party authenticate through **WISPer**
- 2: If successful **WISPer** says to ICD "Ok you can use radio"
- 3: Then the External party can control the ICD

The patient is notified **acoustically** during the whole time.