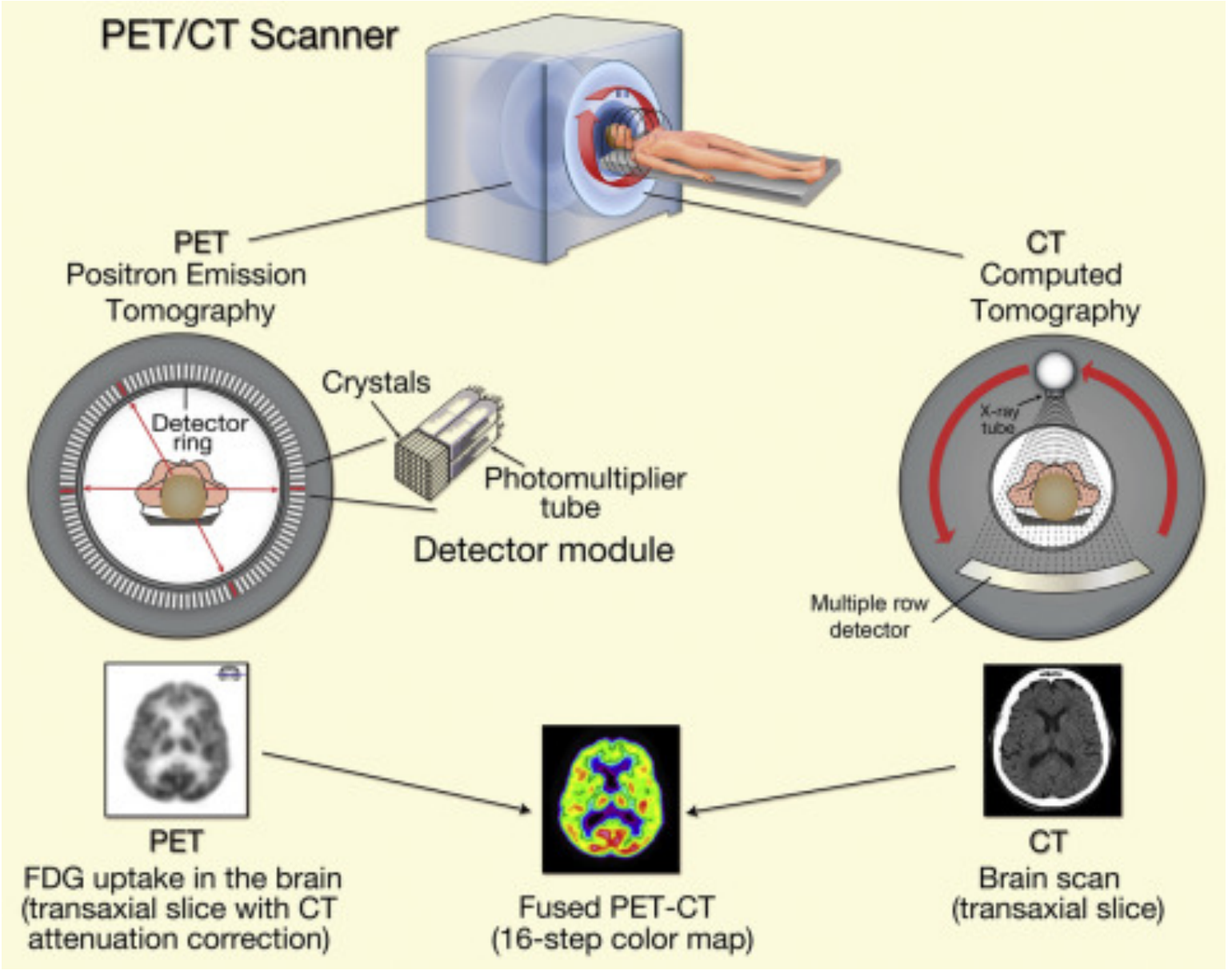
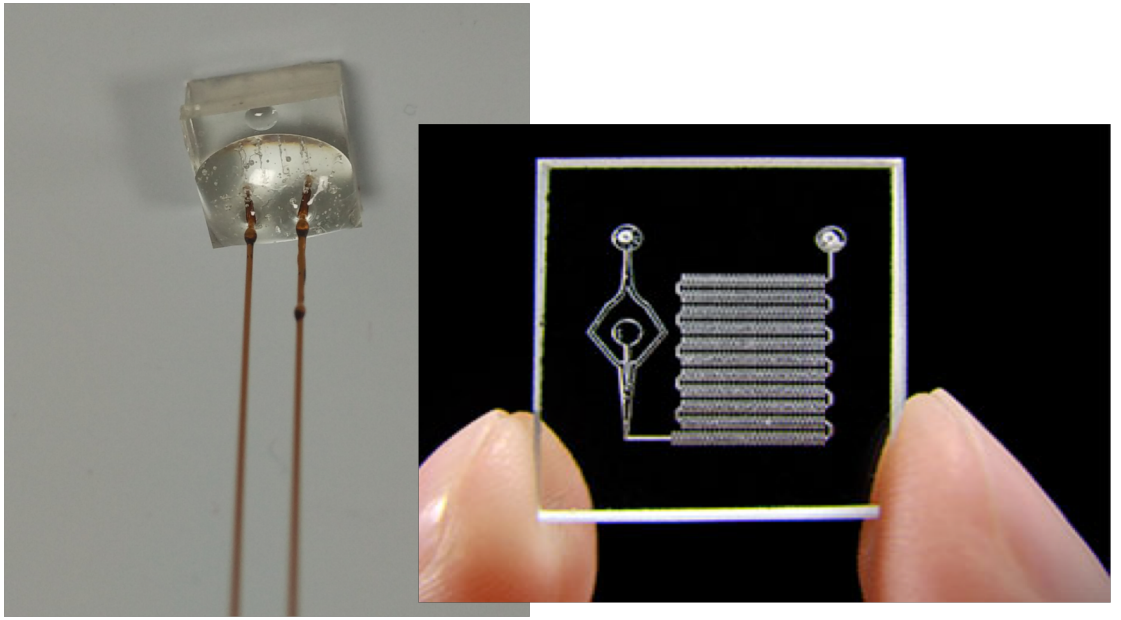

PET/CT Scanner
PET
Positron Emission
Tomography
CT
Computed
Tomography
Detector
ring
Crystals
Photomultiplier
tube
Detector module
X-ray
tube
Multiple row
detector
PET
FDG uptake in the brain
(transaxial slice with CT
attenuation correction)
Fused PET-CT
(16-step color map)
CT
Brain scan
(transaxial slice)

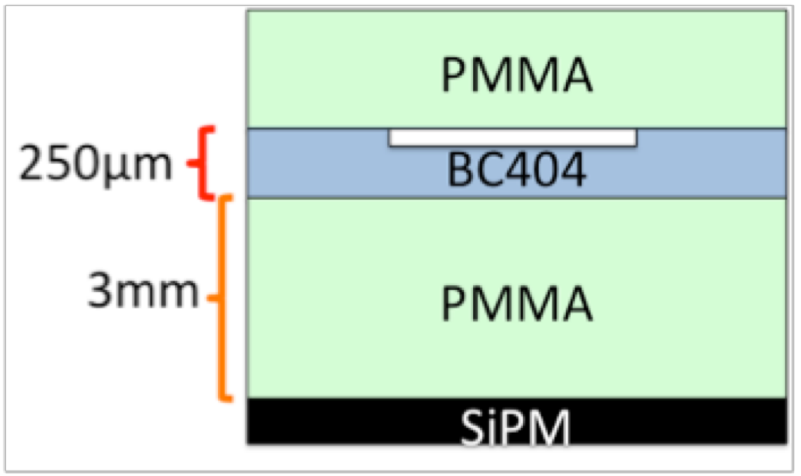
Microfluidic device

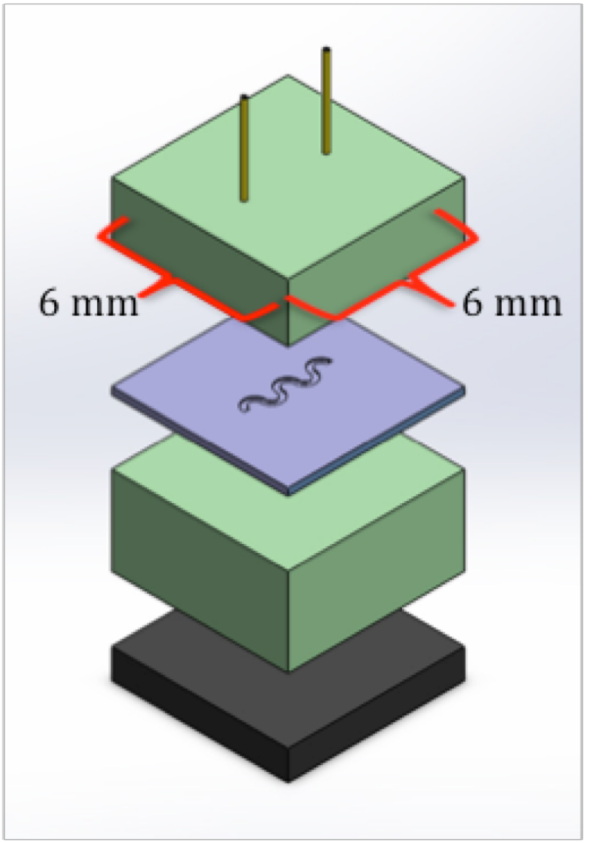
- miniaturise flow channel
- ideal for handling and synthesizing the low volume of radioactive liquid
- advantages
*low cost
*reduce shielding



Microfluidic Fabrication and system setup

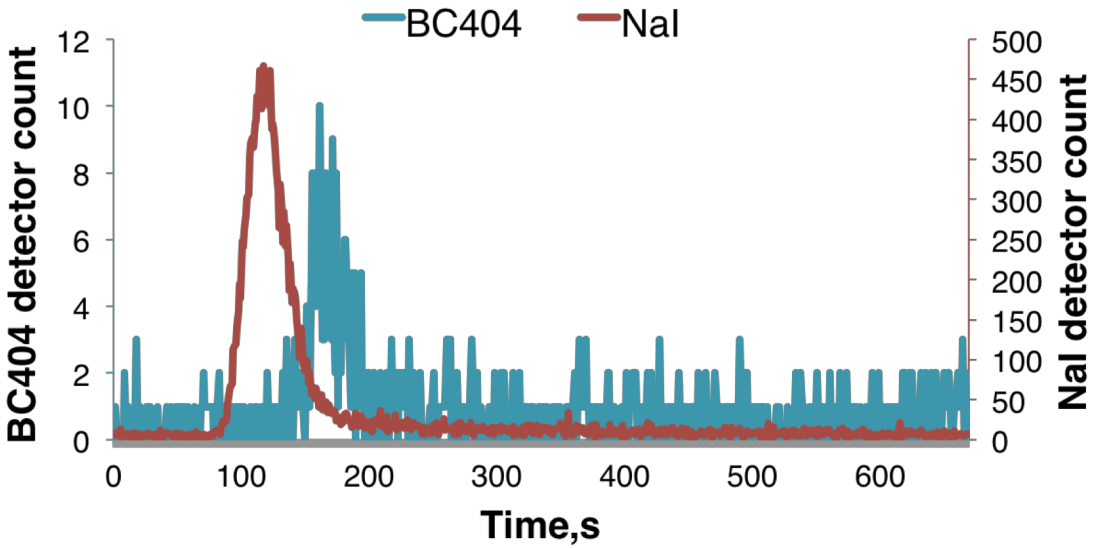
- Chip featured a serpentine channel
- Sealed via double sided tape

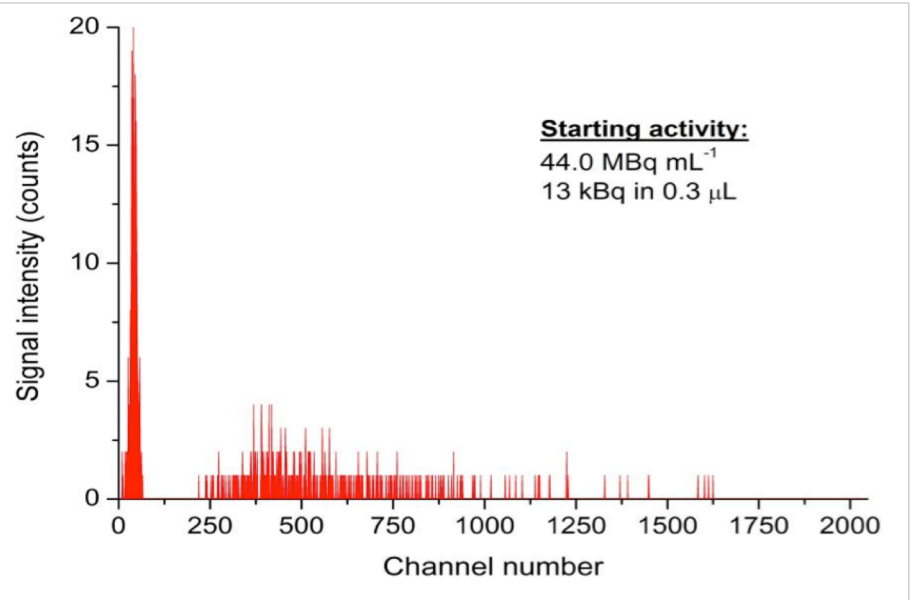




Detector performance

- Continuous energy distribution
- Signal intensity measurements were successfully simulated, though the signal was low
- ^{68}Ga emits positrons with E_{max} = 836keV , which are not entirely stopped in the 250µm plastic scintillator.
- Count signal returned back to background level – no adhesion to channel



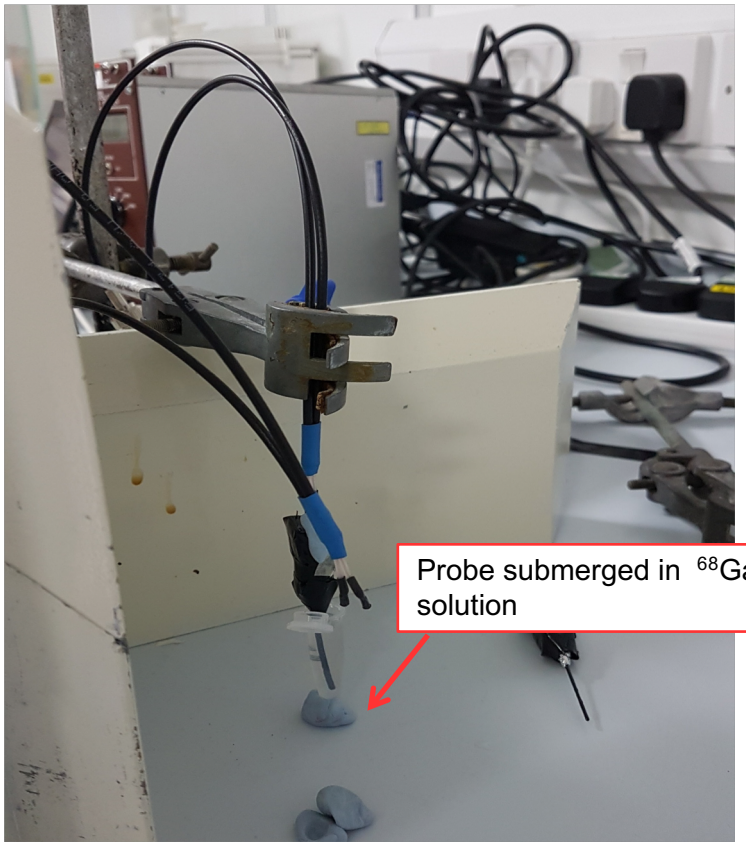


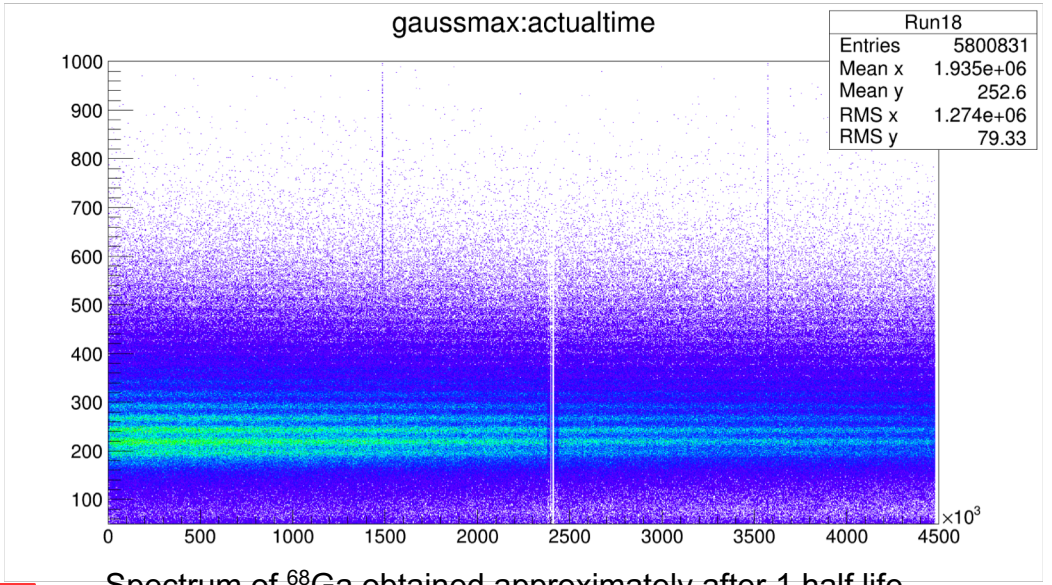
Scintillating fiber probe

- a sensitive probe that can measure blood activity locally inside the tissue or blood vessel
- Eliminate blood depletion, risk of exposure and reduce time.

The positron probe consists of bundle of five polystyrene based plastic scintillating fibers (BCF-10 Saint Gobain) 50 mm length painted with reflecting paint and a layer of black paint coupled to SensL 1x1 mm SiPM

Performance





Spectrum of ^{68}Ga obtained approximately after 1 half life

The light output produced by the scintillating fiber was detected by SiPM and converted to electronic signal.