

Materials List for:

A High-performance Compact Photoacoustic Tomography System for *In Vivo* Small-animal Brain Imaging

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Materials

| Name | Company | Catalog Number | Comments |
|----------------------------------|--|---|--|
| Pulsed laser diode | Quantel, France | QD-Q1910-SA-TEC | It is the excitation laser source with specifications 803 nm, 1.4 mJ per pulse, 136 ns pulse, 7 kHz maximum, dimensions : 11.0 x 6.0 x 3.6 cm, weight: ~150 gm |
| Stepper motor with gearbox | LIN Engineering (Servo Dynamics) | Motor: CO-5718-01P, Gearbox: DPL64/1, I = 10 for NEMA 23; power supply PW100-48 | To move the detector holder in a circular geometry. Torque: 2.08 N-m, Rotor inertia: 2.6 kg-cm ² |
| Ultrasonic pulser/receiver | Olympus | 5072PR | To receive, filter and amplify the PA signal from UST. Its bandwidth is 35 MHz, and gain is ±59 dB. |
| Ultrasound Transducer | Olympus | V306-SU-NK-CF1.9IN/Q4200069 | Ultrasonic sensors used for photoacoustic detection. Central frequency 2.25 MHz, 0.5 in, Cylindrical focus 1.9 inch |
| PCIe DAQ (Data acquisition) Card | GaGe | CSE4227/ A6000610/B0E00610 | 12 bit, 100 Ms/s, 2 channels, 1 Gs on board memory, PCIe x16 interface |
| Rats | In Vivos Pte Ltd, Singapore | NTac:SD, Sprague Dawley / SD | Female, weight 100 ±10g |
| Acrylic water tank | NTU workshop | Custom-made | It contains the water that acts as an acoustic coupling medium between brain and detector |
| Circular Scanner | NTU workshop | Custom-made | Scanner is made out of Alluminum |
| Anesthetic Machine | medical plus pte ltd | Non-Rebreathing Anaesthesia machine with oxygen concentrator. | Supplies oxygen and isoflurane to animal |
| Pulse Oxymeter portable | Medtronic | PM10N with veterinary sensor | Monitors the pulse oxymetry of the animal |
| Ultrasound gel | Progress/parker acquasonic gel | PA-GEL-CLEA-5000 | Clear ultrasound gel |
| Data acquisition software | National Instruments Corporation, Austin, TX, USA) | NI LabVIEW 2015 SP1 | LabVIEW based program was developed in our laboratory for controlling the stepper motor and acquiring the PA signals from the detector |
| Data processing software | Matlab (Mathworks, Natick, MA, USA) | Matlab R2012b | Matlab code for reconstruction of PA images was developed in our lab |
| Temperature controller | LaridTech, MO, USA | MTTC1410 | It will constantly control temperature of the PLD |
| 12 V power supply | Voltcraft | PPS-11810 | To supply operating voltage for PLD |
| Variable power supply | BASETech | BT-153 | To change the laser output power |
| Function generator | Funktionsgenerator | FG250D | To change the repetition rate of the PLD. It will provide TTL signal |

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| | | | to synchronize the DAQ with the laser excitation. |
| Animal distributor | In Vivos Pte Ltd, Singapore | | Animal distributor that supplies small animals for research purpose. |
| Animal holder | NTU workshop | Custom-made | Used for holding the animal on its abdomen |
| Breathing mask | NTU workshop | Custom-made | Used along with animal holder to supply anesthesia mixture to the animal |
| Pentobarbital sodium | Valabarb | | Used for euthanizing the animal after the experiment. |
| Optical diffuser | Thorlabs | DG10-1500 | Used to to make the laser beam homogeneous |