

**BETH ISRAEL DEACONESS
MEDICAL CENTER**
Technology Ventures Office



**BIDMC 1365: Frameless Imaging and Treatment Planning for
Arteriovascular Malformations**

Conventional methods for imaging arteriovascular malformations (AVMs) require securing the patient's skull or spine to a rigid frame. The frame and its attached localizing elements are used to transfer the 2D digital subtracted angiogram (DSA) to the frame's 3D coordinate system. Complementary information from CT or other modalities can then be registered in the frame system. After mapping the nidus, treatment commonly employs stereotactic radiosurgery in reference to the frame system. Although this frame-based technique permits precise treatment, it is painful for the patient and limits treatment options.

BIDMC's Xing-Qi Lu and George Mathiowitz have developed an elegant frameless system for AVM imaging and treatment that does not forgo the advantages of DSA image guidance as the primary image modality. With novel analytical techniques, they have produced a fiducial localizer device, software, and imaging method that make this possible.

This invention extends the range of patients that will opt for DSA image guidance in planning treatments for AVMs, whether the treatments are radiological or manual surgery. Avoiding the burden of the frame while maintaining the high precision of standard DSA imaging, this frameless system will hold strong appeal to care centers assessing AVMs.

Market:

- ✓ Radiologists seeking non-invasive imaging option for AVMs
- ✓ US general incidence of AVM nears 0.14% or 1 case per 700 persons¹ while estimates of AVM prevalence vary ~0.02-2.6%^{1,2}

Commercialization:

- ✓ Method and designs for localizer device and software
- ✓ Flexible licensing options

Competitive Advantages:

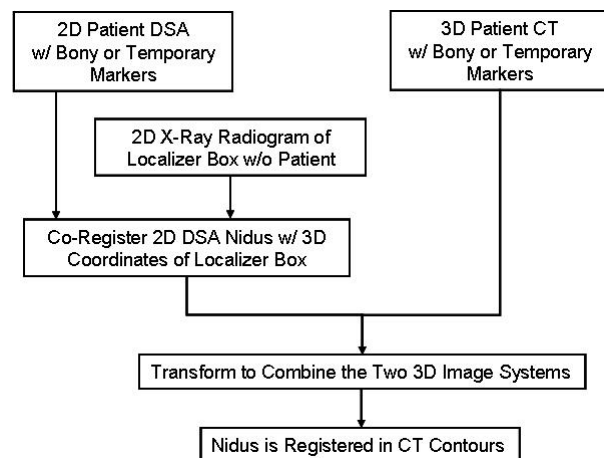
- ✓ Removes need to fix frame to skull in AVM imaging and treatment
- ✓ Cross-platform adaptability

Stage of Development:
Clinical testing underway

Patent / Licensing Status:
Pending U.S. Patent App. #61/371,590

Lead Investigators:
Xing-Qi Lu, PhD
George Mathiowitz, PhD

Contact:
Jason Felsch, Sr. Licensing Manager
Tel: 617.667.9490
Email: jfelsch@bidmc.harvard.edu
Web: www.tv.o.bidmc.harvard.edu



Frameless Lu-Mathiowitz Method for AVM Imaging

Patient's 2D DSA and 3D CT scans are combined without use of a rigid frame to render the nidus in contoured CT slices for evaluation and treatment.

(1) <http://emedicine.medscape.com/article/252426-overview>; Downloaded April 5, 2010; (2) Neurology (1996) 46(4):949