# SNIS 21st annual meeting oral poster abstracts

## P-001 ASSESSMENT OF DISTAL PENETRATION, RADIOPACITY, AND BIOLOGICAL SAFETY RESPONSE OF NEOCAST, A UNIQUE SOLVENT-FREE, NON-ADHESIVE EMBOLIC MATERIAL

[1]C Sadasivan*, [1]D Fiorella, [2,3]A Arthur, [4]Q Pham, [4]J Groom. *[1]Neurosurgery, Stony Brook University Medical Center, Stony Brook, NY; [2]Semmes Murphy Clinic, Memphis, TN; [3]University of Tennessee Health Science Center, Memphis, TN; [4]Arsenal Medical, Waltham, MA*

10.1136/jnis-2024-SNIS.73

**Introduction** NeoCast is a solvent-free, shear-responsive, *in-situ* curing biomaterial designed for embolization applications where complete casting and occlusion of micron-sized vessel branches is desired (e.g., middle meningeal artery embolization to treat chronic subdural hematoma). In this study, we assessed preclinical performance of NeoCast with respect to distal penetration, radiopacity, and biological (vascular and brain tissue) safety response.

**Methods** NeoCast embolization and safety performance was evaluated in a swine kidney model at 7, 30, and 90 days (n=8 injections/timepoint). Onyx-18® (Medtronic) and polyvinyl alcohol particles (PVA, Cook 90–180 micron) were used as controls (n=6 injections/timepoint). Distal penetration and radiopacity of NeoCast and Onyx-18 were assessed via micro-computed tomography imaging of explanted kidneys. Histomorphometry was used to compare distal penetration of PVA and NeoCast by measuring the diameter of vessels containing embolic material in representative images. Histopathology was conducted by CVPath Institute and consisted of assessing fibrosis, necrosis, and inflammatory local vascular responses. Neurotoxicity was conducted by NAMSA and assessed at 7 (n=4) and 90 (n=8) days by injecting NeoCast directly into rabbit brain parenchyma allowing *in-situ* cure. High density polyethylene rods were used as negative controls. Neuropathological evaluation consisted of characterizing inflammatory cell/infiltrates and necrosis.

**Results** NeoCast exhibited superior and more consistent distal penetration into the kidney microvasculature compared to Onyx-18. An end node analysis of embolic casts indicated that NeoCast occluded ~5.2 times more vessel branches compared to Onyx-18 (p=0.006); diameter distribution showed that 68 ±6% of NeoCast-occluded vessels had diameters ≤ 300 micron. Radiographically, NeoCast embolic casts exhibited a homogeneous appearance with a narrow brightness intensity and minimal artifact while Onyx exhibited imaging artifact with an heterogenous appearance characterized by a wide range of brightness intensities. Histologically, NeoCast did not penetrate past the capillaries and was present more frequently in smaller arteries compared to PVA; 64% of measured vessels containing NeoCast were < 200 micron in diameter compared to 15% for PVA (p<0.001). NeoCast local vascular response was similar to Onyx-18 and PVA: inflammation was mild and stable throughout 90 days (indicative of a non-degrading, bioinert material) while fibrosis and necrosis exhibited mature responses consistent with an embolization procedure. NeoCast elicited a benign neurotoxic response with minimal inflammation and no necrosis.

**Conclusion** NeoCast exhibits superior distal penetration and radiopacity compared to commercially available embolic agents and elicits safe vascular and brain tissue responses in animal models. Future studies evaluating NeoCast in human subjects are warranted.

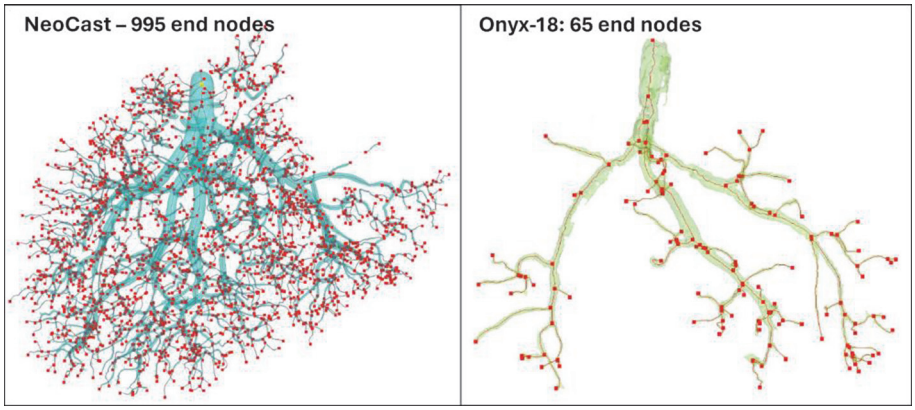
**Disclosures C. Sadasivan:** 1; C; National Cancer Institute – R44CA257802. **D. Fiorella:** 1; C; National Cancer Institute – R44CA257802. 2; C; Arsenal Medical. 4; C; Arsenal Medical. **A. Arthur:** 2; C; Arsenal Medical. 4; C; Arsenal Medical. **Q. Pham:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. 5; C; Arsenal Medical. **J. Groom:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. 5; C; Arsenal Medical.

## P-002 LOW INTRACRANIAL PCO2 IS A DRIVER FOR NEURONAL DEATH AND WORSENED OUTCOMES FOLLOWING THROMBECTOMY FOR ACUTE ISCHEMIC STROKE

J Frank*, E Franz, N Millson, H Hazelwood, N Meredith, K Cochran, M Cox, M Al-Kawaz, Pahwa Fraser, K Pennypacker. *Department of Neurosurgery, University of Kentucky, Lexington, KY*

10.1136/jnis-2024-SNIS.74

**Introduction** Thrombectomy has revolutionized patient outcomes in acute ischemic stroke, but rates of moderate to severe disability and 30-day mortality remain high. The Perfusion Reconnaissance of the Ischemic Stroke Microenvironment (PRISM) study was designed to analyze perfusion imaging and sampling of both systemic and intracranial blood distal to the thrombus, to better understand dynamic blood gas changes in




**Abstract P-001 Figure 1**