**Conclusions:** AZA treatment attenuates aneurysm development and progression in the in vitro aortic porcine pancreatic elastase induction AAA model. Pharmacologic strategies effective at limiting or reducing DNA methylation may have translational applications in the medical management of AAA disease.

Influence of 5-azacytidine treatment on elastase-induced experimental AAs. (A): Mean and standard deviation (SD) of aortic diameters imaged via ultrasonography at the baseline (day 0) and indicated days following porcine pancreatic elastase (PPE) infusion. (B, C, D): Median and 95% confidence interval (CI) for the scores of smooth muscle degeneration (B), elastic degradation (C) and macrophage accumulation (D). (E, F, G): Quantification of nuclear COX-2 (median and 95% CI) 

**Methods:** The Lumee Oxygen System represents a novel approach to tracking tissue oxygen via a subcutaneous hydrogel cutaneous hydrogel that provides noninvasive optical oxygen measurement (Figure) and Buerger disease. A pilot study assessed /C2 hydrogel (0.5

**Results:** Eleven patients had 148 occlusion modulations over 199 days. Mean age was 67 years (range: 55-88 years); with 9% females; 45% White and 55% Black. Rutherford class I: 36%, II: 36%, and III: 27%. The median ankle-brachial index was 0.83 (interquartile range: 0.89-1.14). In the arm, modulation was 56.9 ± 24.6% (Lumee) and 94.7 ± 9.2% (tcpO2) (R = 0.81). In the foot, modulation was 63.4 ± 22.7% (Lumee) and 80.4 ± 15.5% (tcpO2) (R = 0.79). No injection related adverse events occurred.

**Conclusions:** Occlusion-related changes in tissue oxygen can be detected by both tcpO2 and the Lumee sensor, which strongly correlate in both the arm and foot. This pilot phase study supports expansion of the trial. The Lumee sensor shows promise for future evaluation of tissue oxygenation in PAD patients, which could be used to assess changes in tissue oxygenation over time and following revascularization.

**Fig.**

**Fig.**


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**22-VIRC-482-AHA-VD**

**Monitoring Tissue Oxygen Dynamics with a Novel Implantable Hydrogel Sensor in Patients with Peripheral Arterial Disease**

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**Background:** Tissue perfusion measurement remains a fundamental challenge in management of patients with peripheral arterial disease (PAD). Better measurement of baseline and dynamic changes after revascularization would aid clinical judgement. The Wireless Lumee Oxygen System represents a novel approach to tracking tissue oxygen via a subcutaneous hydrogel that provides noninvasive optical oxygen measurement. This study’s objective was to assess the correlation of the Lumee sensor with transcutaneous oximetry (tcpO2) in PAD patients.

**Methods:** The Lumee Oxygen System is a subcutaneously placed hydrogel (0.5 × 0.5 × 5.0 mm). Optical signals are captured with a skin surface reader sensing extravascular oxygenation. A pilot study assessed in vivo performance with inclusion criteria of peripheral arterial disease (Rutherford I-IV). Sensors were injected in the arm and foot and oxygenation measured before, during, and after proximal blood pressure cuff inflation (Figure) and Buerger disease. A pilot study assessed /C2 hydrogel (0.5

**Results:** Eleven patients had 148 occlusion modulations over 199 days. Mean age was 67 years (range: 55-88 years); with 9% females; 45% White and 55% Black. Rutherford class I: 36%, II: 36%, and III: 27%. The median ankle-brachial index was 0.83 (interquartile range: 0.89-1.14). In the arm, modulation was 56.9 ± 24.6% (Lumee) and 94.7 ± 9.2% (tcpO2) (R = 0.81). In the foot, modulation was 63.4 ± 22.7% (Lumee) and 80.4 ± 15.5% (tcpO2) (R = 0.79). No injection related adverse events occurred.

**Conclusions:** Occlusion-related changes in tissue oxygen can be detected by both tcpO2 and the Lumee sensor, which strongly correlate in both the arm and foot. This pilot phase study supports expansion of the trial. The Lumee sensor shows promise for future evaluation of tissue oxygenation in PAD patients, which could be used to assess changes in tissue oxygenation over time and following revascularization.

**Fig.**


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**22-VIRC-510-AHA-VD**

**Comparative Assessment of Peripheral Stent Abrasiveness under Cyclic Deformations Experienced During Limb Flexion**

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**Background:** Poor outcomes of peripheral arterial disease stenting are often attributed to the inability of stents to accommodate the complex biomechanical environment of the flexed lower limb that patients the femoropopliteal artery to bending, torsion, and axial compression. Abrasion damage to the endothelium caused by rubbing of the stent against the artery wall during limb flexion likely plays a significant role in reconstruction failure. But has been poorly characterized.

**Methods:** We subjected seven peripheral Nitinol stents (Misago, AbsoluPro, Innovia, Zilver, SmartControl, SmartFlex, and Supera) with 6-, 7-, and 8-mm diameters to 345,600 cycles of axial compression (25%), bending (90°), and twisting (26°/cm) when deployed inside a 6-mm-diameter electrospray nanofibirillar tube with artery-mimicking mechanical properties. Abrasion was assessed semiquantitatively using a 1 (best) to 7 (worst) scoring system for each of the three deformation modes.

**Results:** When oversized by 1 mm, Misago had the least abrasion and no stent fractures under any deformation modes (overall score 4/21). Innovia had small abrasion and no fractures under compression and torsion but fractured and penetrated the wall under bending (8/21). Supera had minimal abrasion and no fractures under bending and compression but fractured and tore through the wall under torsion (9/21). Zilver fractured under all three deformations, but had more abrasion under bending and compression than under torsion due to strut penetration (12/21).
Background: Approximately 3 million Americans have ill-managed lipidemia due to statin intolerance (SI) or statin-associated myopathy (SAM). Atorvastatin and simvastatin are the most prescribed statins, which are transported into the liver by SLCO1B1 and metabolized by cytochrome P450 (CYP) 3A4 and 3AS. CYP3A4*22 and CYP3A5*3 are two polymorphisms known to decrease their activity; thus, increasing the systemic daily exposure (area under the curve) and serum concentration of unmetabolized statin. In Caucasian populations the prevalence (5%-7%; CYP3A4*22 and 90%; CYP3A5*5) and effect of these polymorphisms is well characterized but not in African American populations. We hypothesize that the prevalence of SI and SAM are correlated with CYP3A5/S polymorphisms in African American populations.

Methods: After institutional review board approval, saliva samples were collected from patients currently prescribed atorvastatin or simvastatin at The Ohio State University Medical for genotyping SLCO1B1 status was assessed to control for its confounding effect. Participants with polygenic results were contacted to complete 8 blood draws over 15 hours for pharmacokinetic analysis. Electronic medical records were used to collect demographic information, medical histories, risk factors, and concomitant medications.

Results: A preliminary analysis of 502 participants (398 African American, 104 Caucasian, and 3 others) shows racially different polymorphic prevalence. Reduced activity of CYP3A4 was present in 5.8% Caucasians versus 0.51%, African Americans. Notably, CYP3A5*5 is inactive in 75% and reduced in 20.3% of Caucasians compared with 41.7% and 40.7%, respectively, in African Americans. A statistically significant increase in SI in African American women vs Caucasian women (P = 0.032) was observed. In combined analysis, atorvastatin has a reduced odds of intolerance compared with simvastatin (odds ratio [OR], 0.463; P < 0.05). However, the odds of SI is higher in patients with no history of cardiovascular disease (OR, 6.137; P < 0.01) and those with chronic kidney disease (OR, 12.69; P < 0.05).

Conclusions: Considering that CYP3A5 is fully active in 18.5% of the African American population compared with 6.8% Caucasian, the characteristic enzyme is of clinical significance in minority populations to better manage lipidemia, assess the safety profile of current therapeutic doses, and reduce SAM.


22-VIRC-525-AHA-VD

Mangiferin Conjugated Gold Nanoparticles Protect against the Development of Abdominal Aortic Aneurysm in an Apeo−/− Mouse Model

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Background: There are no drugs to prevent the growth of abdominal aortic aneurysm (AAA), responsible for approximately 200,000 deaths in the world each year. There is a growing interest in natural anti-inflammatory compounds using nanotechnology-based drug-delivery. Mangiferin (MCF) is one such phytochemical isolated from Mangifera indica. Conjugation of MCF on gold nanoparticles (MCF-AuNPs) enhances bioavailability, through cellular penetration, presenting new opportunities toward the design of innovative nanomedicine agents. Recently, we have demonstrated the unique applications of MCF-AuNPs as an immunomodulatory and anti-inflammatory agent in the treatment of metastatic breast and prostate cancers. Here we investigated whether MCF-AuNPs prevent the development of AAA.

Methods: Apeo−/− mice were subjected to angiotensin (AngII, 1 mg/kg/min)–induced AAA. MCF-AuNPs (approximately 7 mg/30 g mouse) or placebo were administered daily, 1 week before AngII and continued for 28 days (n = 8-12 per group).

Results: The incidence of AAA were significantly attenuated with MCF-AuNPs than AngII group (P < 0.01), associated with a decrease in maximal intraluminal diameter (P < 0.001), pulse wave velocity (P < 0.001), distensibility (P < 0.05), and radial strain (P < 0.05). Degradation of elastin (P < 0.001) proinflammatory cytokines (P < 0.01), and apoptotic cell death (P < 0.01) were significantly reduced in the aortae of MCF-AuNPs-treated Apeo−/− mice than the AngII