AAA MSCs than hMSCs; after 24 h exposure of AAA MSCs to IL-10 (10 ng/ml), we found a decrease of MMP9 mRNA production (60% lower compared to untreated control).

**Conclusion:** Vascular wall-MSCs with stemness properties can assume a pathological phenotype, as demonstrated by the loss of immunomodulatory ability and the increased expression of MMP9, involved in AAA progression.

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**Prototype of a 3D-navigation System for Interventional Therapy of Aortic Aneurysms**

M. Kleemann 1, J. Nolde 1, N. Papenberg 2, J. Modersitzki 2, T. Keck 1

1 University Hospital Schleswig-Holstein-Campus Lübeck, Department of Surgery, Ratzeburger Allee 160, 23538 Lübeck, Germany
2 Institute of Mathematics and Image Computing Fraunhofer MEVIS Project Group Image Registration, Maria-Goeppert-Str. 3, 23562 Lübeck, Germany

**Introduction:** Over the last decade, interventional endovascular stenting of aortic aneurysm has been developed from single center experiences to a standard procedure in many countries. One integral part for the success of this minimally-invasive procedure is innovative and improved vascular imaging. One of the most difficult in learning and performing this interventional therapy is the fact, that the three-dimensional vascular tree has to be overlain with the two-dimensional angiographic scene by the vascular surgeon.

We analyzed patients with an infra-renal aortic aneurysm in which the planning CT-Scans were volume-rendered. At the beginning of the intervention the relevant landmarks were matched in real-time with the two-dimensional angiographic scene. During intervention the software continuously registers the position of the guide-wire or the stent. An additional 3d-screen shows the generated endoluminal view during the whole intervention in real-time.

**Results:** Our preliminary results of navigated endoluminal virtual angioscopy are promising. The “Virtual angioscope” may improve intraoperative visualization, placement of guide-wires and stents. It may reduce the amount of contrast agents and exposure to x-Rays. The prototype also offers the possibility of intervention planning and simulation which may lead to a reduced learning curve and therefore patient safety.

**Conclusion:** Not only for pre-interventional simulation, even in training of inexperienced surgeons or interventionalists, our 3D navigation system may offer better visualization in complex endoluminal aortic procedures.

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**Plasma and Patterning: The New Focus for the Development of Nanocomposite Vascular Grafts**

D.S.T. Chong, B. Lindsey, M.J. Dalgleish, N. Gadegaard, A.M. Seifalian, G. Hamilton

University College, London, UK

**Introduction:** The concept of surface modulation holds much promise for the future development of vascular grafts. Our aim is to enhance a nanocomposite material using surface modification techniques such as plasma technology and surface patterning to augment both surface chemistry and topography with a view towards endothelialisation.

**Methods:** Polyhedral oligomeric silsesquioxane (POSS) was combined with polycarbonate urea urethane (PCU) to produce a Nanocomposite polymer. Microgrooves with pitch size of 25 µm was created using photolithography. Fidelity was verified with scanning electron microscopy (SEM) and atomic force microscopy (AFM). The polymer was then exposed to pure O2 plasma and contact angles were measured. Human umbilical vein endothelial cells (HUVECs) were then seeded onto POSS-PCU. The metabolic activity of the cells was assessed and immunostaining was used and subsequently visualised with confocal microscopy.

**Results:** Contact angle results (mean: 85°) show the increase hydrophilicity of the polymer surface and both AFM and SEM confirm the high replication of the microgrooves within the surface of the polymer using photolithography. Metabolic activity of HUVECs on the surface modified polymer was significantly increased compared with control (p < 0.05). Further immunostaining further confirms the adhesive nature of the cells as well as the migratory potential.

**Conclusion:** Using a combination of plasma technology and surface patterning to augment both surface chemistry and topography on a nanocomposite polymer promotes increased endothelial cell adhesion, migration and proliferation. The ordered microgrooves were seen to enhance cellular adhesion and spreading. Plasma technology and micro-grooving is a promising methodology to optimise luminal endothelialisation and the prospect for ‘self-endothelialisation.’

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**A Novel Approach in Therapeutic Angiogenesis: Low Doses of Ionizing Radiation**

A. Ministro 1,2, R.J. Nunes 1, P. de Oliveira 1, A. Rocha 1, I. Monteiro Grillo 1, S. Constantino 1

1 Instituto de Medicina Molecular, Lisboa, Portugal
2 Vascular Surgery Department, CHLN, Lisboa, Portugal
3 Radiotherapy Department, CHLN, Lisboa, Portugal

**Introduction:** Therapeutic augmentation of collateral artery sprout and growth (i.e., angiogenesis and arteriogenesis) is of particular clinical interest in improving blood flow in vascular occlusive disease. We found that low doses of...