**TCT-184**

**Immolized recombinant human tropoelastin on a plasma-activated coating dramatically enhances biocompatibility of metal alloys: implications for coronary stents**

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**Background:** Metallic endovascular stents have suboptimal biocompatibility reducing their clinical efficacy. We sought to develop a unique non-thrombogenic metal/protein interface to covalently bind proteins in their bioactive state to metallic surfaces, to achieve vascular biointegration of stents. We then bound recombinant human tropoelastin (TE), a major regulator of vascular cell function, to metallic stent surfaces and investigated the biocompatibility of TE-coated metal compared to 316L stainless steel (SS).

**Methods:** A pulsed plasma deposition system was developed to deposit a plasma-activated coating (PAC), a carbon-based surface capable of covalent protein binding, on 316L stainless steel sheets or on slotted tube stents. Horseradish peroxidase and human recombinant TE were bound to PAC. PAC surfaces were characterized for (1) coating durability, 2) immobilized protein adhesion, activity and stability, 3) cellular interactions and 4) thrombogenicity.

**Results:** PAC is extremely smooth (1-2nm rms roughness), is wear resistant using a 3 week pulsed flow of 500ml/min, 100 pulses/minute. PAC vesicles delaminated after stress expansion. Horseradish peroxidase activity (a probe for retention of protein conformation) remained higher after 10 days when bound to PAC vs SS. TE remained attached to PAC despite SDS washing, and incubation with supraphysiological serum enzymes, indicating covalent binding. PAC+TE coating dramatically enhanced endothelial cell attachment and proliferation by 86.3±10.5% (p<0.01) & 76.9±4.6% (p<0.001 vs Control) respectively. Moreover, thrombus weight was reduced on PAC & PAC+TE by 94.0±0.9% and 93.1±2.0% respectively (p<0.001 vs Control) in a modified Chandler loop, and time to clot formation was reduced 3-fold. Serum soluble P-selectin was reduced by 25.8±8.7% and 24.5±8.7% on PAC and PAC+TE respectively, p<0.05.

**Conclusion:** PAC is durable, non-thrombogenic metal coating that enables covalent binding of bioactive proteins to stents. PAC+TE enhanced endothelialisation and remained non-thrombogenic. This has profound potential to improve stent efficacy.

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**Comparison of bivalirudin versus heparin during PCI in patients receiving prasugrel M Hamon, S Marso, SV Rao, M Valgimigli, F Verheugt, A Gershlick, Y Wang, GP Steg, E Deliargyris**

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**Background:** Antiplatelet agents are used as adjunctive agents with BIV or HEP during PCI in patients receiving GPI (n=3609). Some patients (pts) are unable to tolerate aspirin due to sensitivity, or require an alternative antiplatelet agent. We compared clinical outcomes and safety in pts treated with bivalirudin (BIV) or heparin (HEP) for PCI in pts being treated with prasugrel (P). We conducted a post-hoc analysis of a pooled database.