areas co-registered with VH-IVUS and compared to contrast attenuation to create contrast ratios for each plaque component. These ratios were used to create a colour map of the plaque based on the HU of its constituents and used to test: (A) Classification of plaque components against histology in 10 post-mortem human coronary arteries. (B) Quantification of plaque geometry and composition compared with VH-IVUS in 30 coronary segments. (C) Ability to differentiate 63 patients prospectively enrolled with either stable angina or acute coronary syndrome.

**Results**

(A) CT contrast ratio defined HU-colour maps were created for the 10 post-mortem arteries which were then sectioned into eighty-seven 400 μm segments for histological analysis. The maps permitted detection of significant atherosclerosis with sensitivity-92% and specificity-90%, calcified-plaque with sensitivity-80% and specificity-88% and necrotic core sensitivity-55%, specificity-96%. If only necrotic core area >2 mm² are considered (above the spatial resolution of CT) there is a significant improvement in sensitivity-75%. (B) Plaque-maps were created for 900 mm of coronary segments and co-registered with VH-IVUS. On average, CT overestimated total plaque area by 44%, vessel volume-33%, lumen-10%, necrotic core-140%, fibrous plaque-70% and calcified plaque-9%. However, correlation between CT and VH-IVUS was highly significant (r=0.001) for all measurements: vessel volume (r=0.86), lumen (r=0.74), necrotic core (r=0.47), fibrous plaque (r=0.74) and calcified plaque r=0.69). (C) Culprit lesions of 31 patients with stable angina and 32 with troponin-positive ACS underwent CT prior to PCI. Features discriminating acute from stable plaque detected using the plaque-maps include: micro-calciﬁcation-63% vs 35% (p=0.01), distinct necrotic core-56% vs 23% (p=0.01) (Abstract 095 ﬁgure 1) and positive vessel remodelling-68% vs 26% (p=0.01). The percentage of necrotic core (low attenuation plaque) was higher in acute plaques-54% vs 40% (p=0.01) while conversely the percentage of calcified plaque (high attenuation plaque) was lower-4% vs 15% (p=0.01). Intra-plaque contrast was more common 44% vs 6% (p=0.001) with high speciﬁcity for acute plaques (94%) and we feel it may represent visualisation of plaque rupture (Abstract 095 ﬁgure 1).

**Conclusion**

Plaque-mapping with contrast ratios allows plaque quantification and may assist diagnosis of acute plaque rupture.