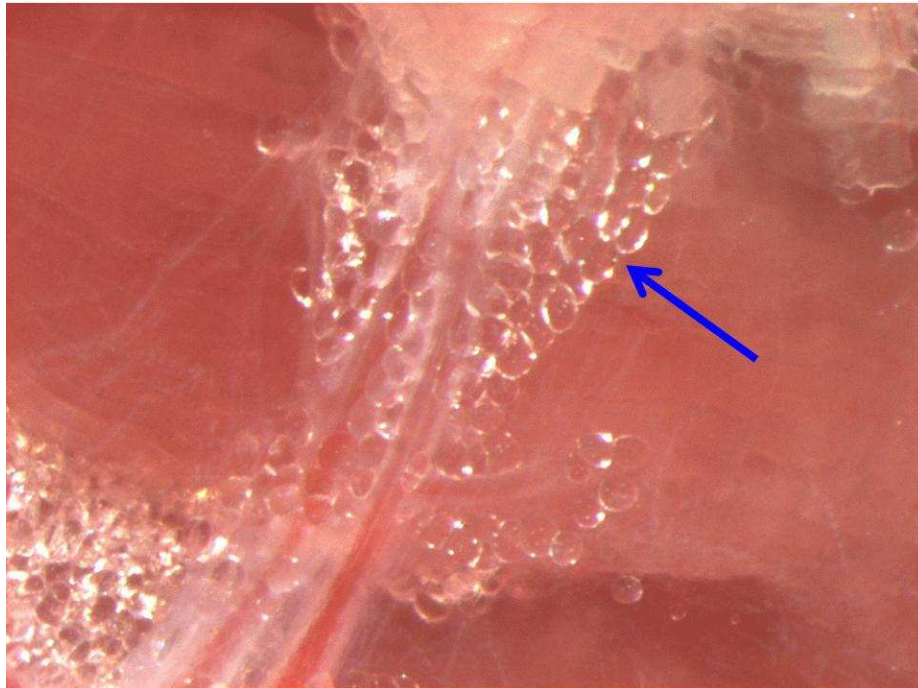


## Perivascular adipose tissue in control of organ perfusion and glucose metabolism

E.C. Eringa, Institute for Cardiovascular Research, VU University Medical Centre, Van der Boechorststraat 7, 1081BT Amsterdam, The Netherlands.

Obesity and its metabolic and cardiovascular complications are a major threat to global health. Ectopic fat independently relates to vascular dysfunction, which in turn is tightly associated with insulin resistance and type 2 diabetes. Perfusion of muscle, which contributes to regulation of insulin sensitivity, is determined by vasoactive actions of insulin on muscle resistance arteries. Perivascular adipose tissue (PVAT, Figure) influences a variety of vascular functions including vasodilation/constriction and infiltration of inflammatory cells.



*Perivascular adipose tissue (PVAT, blue arrow) in a biopsy taken from the vastus lateralis muscle of a healthy obese female subject. One representative example of 18 subjects is shown. From Meijer et al. (2015).*

These effects are mediated by distinct and sometimes antagonistic signaling pathways: while PVAT exerts vasodilator effects through the adventitia-derived hyperpolarizing factor, adiponectin and AMP-activated protein kinase in endothelium, it exerts vasoconstriction through angiotensin and c-jun N-terminal kinase (JNK). In human and experimental obesity, the balance of these effects is shifted from a vasodilator to a vasoconstrictor phenotype, and this shift can be reversed by inhibition of inflammation. Aside from dietary influences on PVAT function, the role of local muscle activity on the quantity and vasoactive properties of PVAT are also important. In conclusion, accumulation and inflammation of perivascular adipose tissue are emerging as causal links between obesity, vascular dysfunction and type 2 diabetes.

Meijer RI, Serné EH, Korkmaz HI, van der Peet DL, de Boer MP, Niessen HW, van Hinsbergh VW, Yudkin JS, Smulders YM, Eringa EC. (2015) *Diabetologia* **58**, 1907-15.