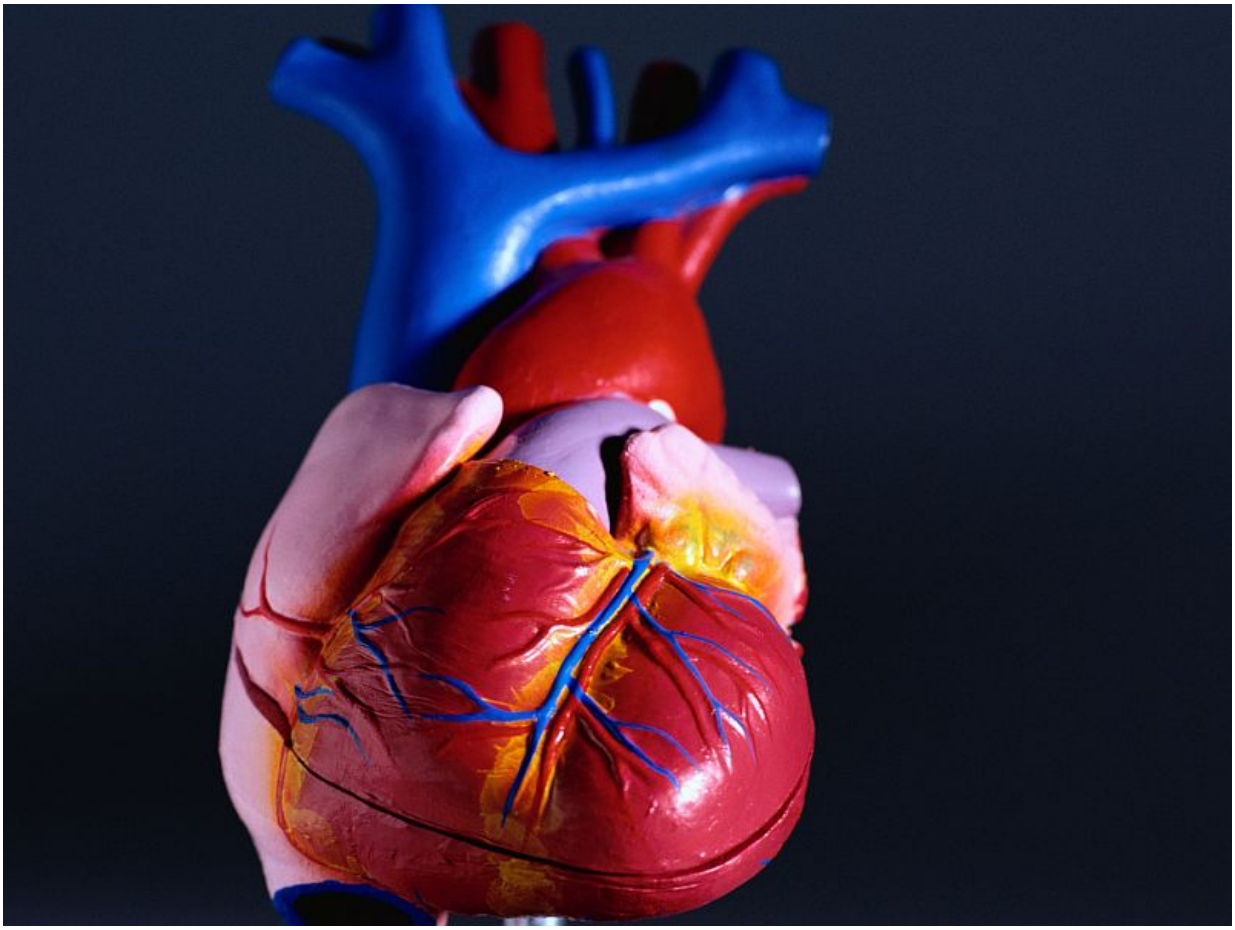
Diabetes may impair myocardial proangiogenic response

January 10 2017



(HealthDay)—The amplitude of therapeutic revascularization associated

with recombinant adeno-associated virus (rAAV) (5×10^{12} viral particles encoding thymosin beta 4 [Tβ4]) is reduced with diabetes mellitus, according to an experimental study published in the Jan. 17 issue of the *Journal of the American College of Cardiology*.

Rabea Hinkel, D.V.M., from the Technical University of Munich, and colleagues obtained myocardial samples from patients with end-stage heart failure, and used diabetic (db) and wild-type (wt) pigs to analyze myocardial vascularization and function. The authors introduced chronic ischemia percutaneously in the circumflex artery on day 0. At day 28, they applied rAAV (5×10^{12} viral particles encoding vascular endothelial growth factor-A or rAAV.Tβ4) regionally.

The researchers found that, compared with nondiabetic explants, diabetic human myocardial explants revealed capillary rarefaction and pericyte loss. In db pigs, hyperglycemia induced capillary rarefaction in the myocardium, even without ischemia, concomitant with a distinct loss of ejection fraction (EF). In chronic ischemic hearts, capillary density further decreased, as did EF. Capillary density and maturity were enhanced in db hearts less efficiently than in wt hearts following treatment with rAAV.Tβ4, similar to collateral growth. rAAV.Tβ4 improved EF in db hearts, but to a lesser extent than in wt hearts.

"Diabetes mellitus destabilized microvascular vessels of the heart, affecting the amplitude of therapeutic neovascularization via rAAV.Tβ4 in a translational large animal model of hibernating myocardium," the authors write.

One author filed and licensed patent applications on microRNA biomarkers.

More information: Full Text
Editorial