drink (20% w/v) for 12 weeks. Randomly selected rats were either trained on a treadmill at moderate intensity (60-70% maximal aerobic speed) for 6 weeks (0° incline, 1 h/day, 5 days/week) or kept sedentary. Rats were weighed and their drink and food consumption were measured weekly. Fasting glycemia and systolic pressure were monitored. Glucose tolerance was evaluated using an oral glucose tolerance test; insulinemia was measured concomitantly. Endothelial function was studied on isolated aorta rings. After only 6 weeks of fructose supplementation rats had a higher energy intake (p<0.001) but were not overweight. These rats also presented an elevated glycemia (+14.3%, p<0.001) and a reduced glucose tolerance (p<0.01). Systolic blood pressure (+23.4%, p<0.001) and heart volume (p<0.05) were increased. After 12 weeks of fructose supplementation, sedentary rats were overweighted and presented an insulin resistance. In fructose supplemented rats, exercise helped to reduce overweight, fasting glycemia (p<0.01), heart volume (–13.1%, p<0.01) and insulin resistance (p<0.001). Surprisingly, exercise enhanced endothelial dysfunction in both diabetic and control rats (p<0.01) but no effect of the fructose supplementation was observed. Thus, indicating that exercise reduced only age related endothelial dysfunction. In this new model of Wistar rats with induced DT2, moderate exercise improved some DT2 markers like fasting glycemia and insulin resistance.

Key role of eNOS in exercise-induced cardioprotection is dependent from coronary endothelium

Charlotte Farah (1), Alessandro Nascimento (2), Gaetan Bolea (2), Grégory Meyer (2), Sandrine Gayrard (2), Olivier Cazorla (1), Cyril Reboul (2)
(1) CHU Montpellier Arnaud de Villeneuve, INSERM U1046, Montpellier, France – (2) Université d’Avignon, EA 4278 Laboratoire de Pharm-Ecologie Cardiovasculaire, Avignon, France

To date, it is clearly accepted that the activation of endothelial isoform of NOS (eNOS) by exercise training constitutes a key trigger of exercise-induced cardioprotection against ischemia-reperfusion (IR). However, this enzyme is expressed both in coronary endothelial cells and cardiomyocytes, but the contribution of the one or the other to such cardioprotection has never been challenged. The aim of this study was then to investigate the role of cardiomyocytes vs. endothelial eNOS in exercise cardioprotection. To this, rats were assigned to sedentary (Sed) or anoxia-reoxygenation (Ex) group. Effects of exercise on vulnerability to IR or anoxia-reoxygenation (AR) were respectively evaluated at whole heart or cardiomyocytes and coronary artery levels. On a first set of rats, isolated cardiomyocytes were submitted to AR in presence or not of L-NAME, an eNOS inhibitor. Exercise reduced cells death and improved cells contractility after AR, but no effect of L-NAME was observed. Interestingly, exercise had no effect neither on eNOS phosphorylation on its activation site (Ser1177) nor on S-nitrosylation at cardiomyocytes level, whereas at whole heart level exercise increased both of them, suggesting that exercise impacted endothelial cells rather than cardiomyocytes. Then, to evaluate the contribution of endothelial cells on exercise-induced cardioprotection, we used Langendorff apparatus we treated hearts with Triton X-100 before IR to abolish coronary endothelial cells activity. Inactivation of endothelial cells totally suppressed cardioprotection effects of exercise. Finally, coronary arteries were isolated from hearts submitted to IR and endothelial function was assessed on a wire-myograph. We observed that alteration of endothelium-dependent coronary relaxation induced by IR was reduced in Ex group. In conclusion, these results show that coronary endothelial cells rather than cardiomyocytes play a key role in eNOS-dependent cardioprotection in Ex rat hearts.

Endurance training induced functional TRPM4 channel expression in mouse left ventricle

Mélanie Gueffier (1), Mathieu Granier (2), Franck Amond (1), Christophe Hedon (3), Jean-Luc Pasquié (3), Pierre Launay (4), Jean-Frédéric Brun (5), Sylvain Richard (1), Marie Demion (1)
(1) CHU Montpellier Arnaud de Villeneuve, INSERM U1046, Montpellier, France – (2) CHRU Nîmes, Cardiologie, Nîmes, France – (3) CHU Montpel- lier, Cardiologie, Montpellier, France – (4) Faculté de Médecine Paris Diderot, U699, Paris, France – (5) CHU Montpellier, CERAM, Montpellier, France

Aim: Transient Receptor Potential (TRP) channels, in particular the TRPC subclass, have been shown as pathological cardiac hypertrophy (CH) regula-