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Microparticle formation by platelets exposed to high gas pressures – an oxidative stress
response

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Microparticle formation by platelets

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ABSTRACT:

This investigation explored the mechanism for microparticles (MPs) production by human and murine platelets exposed to high pressures of inert gases. Results demonstrate that MPs production occurs via an oxidative stress response in a dose-dependent manner and follows the potency series $N_2 > Ar > He$. Gases with higher van der Waals volumes or polarizability such as SF_6 and N_2O , or hydrostatic pressure, do not cause MPs production. Singlet O_2 is generated by N_2 , Ar and He, which is linked to NADPH oxidase (NOX) activity. Progression of oxidative stress involves activation of nitric oxide synthase (NOS) leading to S-nitrosylation of cytosolic actin. Exposure to gases enhances actin filament turnover and associations between short actin filaments, NOS, vasodilator-stimulated phosphoprotein (VASP), focal adhesion kinase (FAK)

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