

## Vasculogenic stem cell mobilization and wound recruitment in diabetic patients: Increased cell number and intracellular regulatory protein content associated with hyperbaric oxygen therapy

Milovanova TN<sup>1</sup>, Sorokina EM<sup>1</sup>, Moore JS<sup>2</sup> and Thom SR<sup>1</sup>

<sup>1</sup>Institute for Environmental Medicine, University of Pennsylvania Medical Center, USA

<sup>2</sup>Flow Cytometry Core Facility, USA

Diabetic patients undergoing hyperbaric oxygen therapies (HBO(2)T) for refractory lower extremity neuropathic ulcers exhibit more than a twofold elevation ( $p=0.004$ ) in circulating stem cells after treatments and the post-HBO(2)T CD34(+) cell population contains two- to threefold higher levels of hypoxia inducible factors-1, -2, and -3, as well as thioredoxin-1 ( $p<0.003$ ), than cells present in blood before HBO(2)T. Skin margins obtained from 2-day-old abdominal wounds exhibit higher expression of CD133, CD34, hypoxia inducible factor-1, and Trx-1 vs. margins from refractory lower extremity wounds and expression of these proteins in all wounds is increased due to HBO(2)T ( $p<0.003$ ). HBO(2)T is known to mobilize bone marrow stem cells by stimulating nitric oxide synthase. We found that nitric oxide synthase activity is acutely increased in patients' platelets following HBO(2)T and remains elevated for at least 20 hours. We conclude that HBO(2)T stimulates vasculogenic stem cell mobilization from bone marrow of diabetics and more cells are recruited to skin wounds.

### Biography

Tatyana N.Milovanova received M.D. degree in Pediatrics 1979 and Ph.D. degree in 1990 in biomedical sciences in Second Medical Academy Moscow, Russia. She completed postdoctoral fellowship and research associate training in the University of Pennsylvania, USA in 200-2005. She is Senior Research Investigator in the Hyperbaric Oxygen Treatment Laboratory, Institute for Environmental Medicine, Department of Medicine, University of Pennsylvania. She is the author of 28 of peer-reviewed papers, editor of several journals, has numerous awards. She is the expert in clinical flow cytometry in mesenchymal stem cells and microparticles.

tmilovanova@hotmail.com