Xiangrong Shi, PhD
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Area of Expertise

The focus of my research lab is to apply and assess a safe intermittent-hypoxia (IH) procedure as a physical-conditioning regimen to preserve and improve the heart and brain functions in humans. Repeated intermittent-hypoxia induces cyclic, brief, and moderate decreases in blood oxygen concentration, and increases heart rate and breathing rate. We have found that IH conditioning is a safe, novel, and effective way to improve heart function and to optimize oxygen delivery to the brain. We believe this IH intervention is beneficial for older adults, especially those who cannot participate in regular physical activities because of the limitations associated with age-related declining physical or mental functions. Moreover, repeated low-dose intermittent-hypoxia can promote and mobilize the growth factors for healthy nerve system and blood vessel. These physiological and neurobiological reactions and adaptations to IH conditioning may have multi-faceted influences on prevention and treatment for mild Alzheimer's disease and cognitive impairment associated with aging.

Qualifications

PhD in Physiology, Yale University

MA in Exercise Science, Shanghai Institute of Physical Education

BA in Physical Education, Shanghai Teachers University

Recent Publications

Risk factors associated with poor physical fitness in three- to six-year-old children in tujia-nationality settlement of China
Liu, X., Xiang, Z., Liu, C., Shi, X., Yi, X., Cheng, M., Schenck, H. & Bates, J., 1 Jan 2018, In : Evidence-based Complementary and Alternative Medicine. 2018, 5702190.

Enhanced cerebral perfusion during brief exposures to cyclic intermittent hypoxemia
Liu, X., Xu, D., Hall, J. R., Ross, S. E., Chen, S., Liu, H., Mallet, R. T. & Shi, X., 1 Dec 2017, In : Journal of applied physiology (Bethesda, Md. : 1985). 123, 6, p. 1689-1697 9 p.

The risk factors of 9-year follow-up on hypertension in middle-aged people in Tujia-Nationality settlement of China
Liu, X., Liu, C., Schenck, H., Yi, X., Wang, H. & Shi, X., 1 Dec 2017, In : Journal of Human Hypertension. 31, 12, p. 838-842 5 p.

Aerobic exercise training improves orthostatic tolerance in aging humans
Xu, D., Wang, H., Chen, S., Ross, S. E., Liu, H., Yurvati, A., Raven, P. B. & Shi, X., 1 Jan 2017, In : Medicine and Science in Sports and Exercise. 49, 4, p. 728-735 8 p.

The Risk Factors of High Blood Pressure among Young Adults in the Tujia-Nationality Settlement of China
Liu, X., Xiang, Z., Shi, X., Schenck, H., Yi, X., Ni, R. & Liu, C., 1 Jan 2017, In : BioMed Research International. 2017, 8315603.

BioWatch: A Noninvasive Wrist-Based Blood Pressure Monitor That Incorporates Training Techniques for Posture and Subject Variability
Thomas, S. S., Nathan, V., Zong, C., Soundarapandian, K., Shi, X. & Jafari, R., 1 Sep 2016, In : IEEE Journal of Biomedical and Health Informatics. 20, 5, p. 1291-1300 10 p., 7163275.

Intermittent hypoxia training protects cerebrovascular function in Alzheimer's disease
Manukhina, E. B., Downey, H. F., Shi, X. & Mallet, R. T., 1 Jun 2016, In : Experimental Biology and Medicine. 241, 12, p. 1351-1363 13 p.

Two-week normobaric intermittent-hypoxic exposures stabilize cerebral perfusion during hypocapnia and hypercapnia
Zhang, P., Shi, X. & Downey, H. F., 14 Jul 2015, In : Experimental Biology and Medicine. 240, 7, p. 961-968 8 p.

Associations of health disparities and physical activity with children's health and academic problems
Shi, X., Tubb, L., Chen, S., Fulda, K. G., Franks, S. F., Reeves, R. E. & Lister, G., 1 Jan 2014, In : Journal of Exercise Science and Fitness. 12, 1, p. 7-14 8 p.

BioWatch - A wrist watch based signal acquisition system for physiological signals including blood pressure
Thomas, S. S., Nathan, V., Zong, C., Akinbola, E., Aroul, A. L. P., Philipose, L., Soundarapandian, K., Shi, X. & Jafari, R., 1 Jan 2014, *2014 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC 2014*. Institute of Electrical and Electronics Engineers Inc., p. 2286-2289 4 p. 6944076

Sponsored Projects

Cranial Osteopathy and Cerebral Tissue Oxygenation
Shi, X.
American Osteopathic Association
1/09/09 → 30/08/10

Intermittent Hypoxia and Cardiovascular Function - The Effect of Age: Acute Cardiovascular response to Simulated OSA
Shi, X.
Intramural Research(UNTHSC)
1/06/16 → 31/05/17

Intermittent Hypoxia as a Therapy for Cognitive Loss in Aging: A Proof-of-Concept Pilot Study
Shi, X.
Intramural Research(UNTHSC)
1/09/15 → 31/08/16

Intermittent Hypoxia - Novel Intervention for Treatment of Mild Cognitive Impairment
Shi, X.
Texas A&M Health Science Center
1/10/15 → 30/09/17

Wrist-Based Non-Invasive Wearable Sensors for Continuous Blood Pressure Monitoring using Pulse Transit Time
Shi, X. & Hensel, K.
Intramural Research(TxMRC)
1/05/13 → 30/04/14