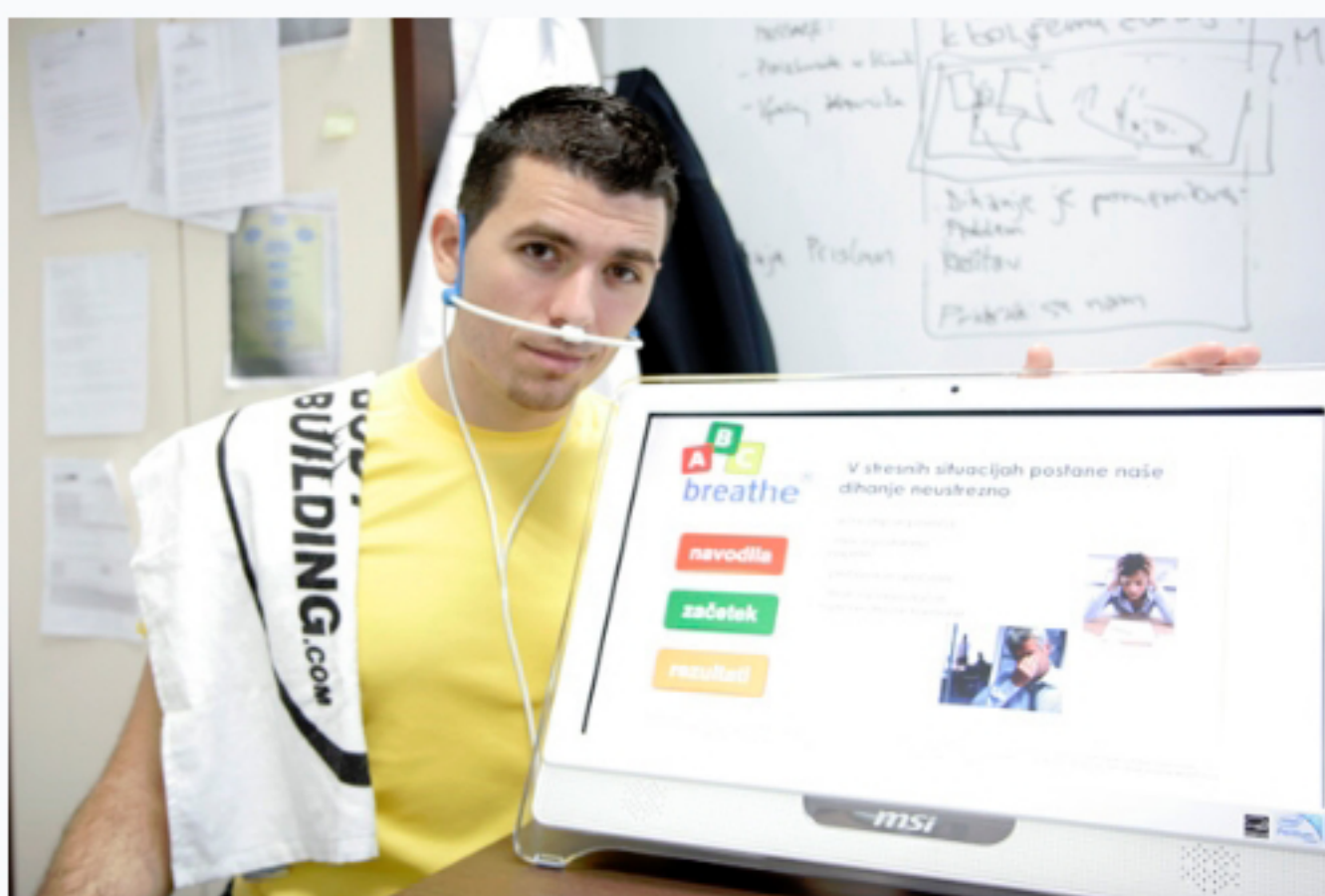


MojDih d.o.o.

Zdrav dih v zdravem telesu!

MojDih Znanost

Osrednje raziskovalno področje znanstvenega oddelka so predvsem nefrofiziološki mehanizmi za proženje ritma dihanja pri človeku in povratni učinki dihanja na avtonomni živčni sistem.



Pri dihalni biofeedback terapiji vplivamo predvsem na sklop nevronov pre-Botzingerjevega kompleksa, ki se nahaja v podaljšani hrbtenjači in uravnava ritem dihanja pri človeku in ostalih primatih [1-5]. Učenje pre-Botzingerjevega kompleksa izvajamo z stimulacijo uporabnikovega slušnega in vidnega korteksa možgan v odvisnosti od posamezne faze cikla dihanja, s čimer izvajamo klasično pogojeno učenje (glej *classical conditioning*). Po nekaj terapijah se prevodnost nevronov pre-Botzingerjevega kompleksa trajno poveča (glej *long term potentiation, synaptic plasticity*) [6-12], posledično pa prične uporabnik pravilno dihati, t.j. globoko dihanje s podaljšanimi izdih, ne da bi moral biti zavestno pozoren na to.

1. Rybak IA, Abdala AP, Markin SN, Paton JF, Smith JC (2007). "Spatial organization and state-dependent mechanisms for respiratory rhythm and pattern generation". *Progress in Brain Research* 165: 201-20. doi:10.1016/S0079-6123(06)65013-9. PMID 17925248
2. VanDam, Shields, D Kelty, Rhythm generation by the pre-Bötzing Complex in medullary slice and island preparations: Effects of adenosine A1 receptor activation
3. Smith *et al.*, Spatial and Functional Architecture of the Mammalian Brain Stem Respiratory Network: A Hierarchy of Three Oscillatory Mechanisms, *Journal of Neurophysiology*, 2007
4. Smith JC, Ellenberger HH, Ballanyi K, Richter DW, Feldman JL (November 1991). "Pre-Bötzing complex: a brainstem region that may generate respiratory rhythm in mammals". *Science (New York, N.Y.)* 254 (5032): 726-9. PMID 1683005
5. Gargaglioni LH, Bicegoa KC, Branco LG (December 2008). "Brain monoaminergic neurons and ventilatory control in vertebrates". *Respiratory Physiology & Neurobiology* 164 (1-2): 112-22. doi:10.1016/j.resp.2008.04.017. PMID 18550453
6. Cooke SF *et al.*, Plasticity in the human central nervous system, 2006 *Brain* 129 (Pt 7): 1659-73
7. Gaiarsa, J.L.; Caillard O., and Ben-Ari Y. (2002). "Long-term plasticity at GABAergic and glycinergic synapses: mechanisms and functional significance". *Trends in Neurosciences* 25 (11): 564-570. doi:10.1016/S0166-2236(02)02269-5. PMID 12392931
8. Shi, S.H.; Hayashi Y., Petralia R.S., Zaman S.H., Wenthold R., Svoboda K., Malinow R. (1999). "Rapid spine delivery and redistribution of AMPA receptors after synaptic NMDA receptor activation". *Science* 284 (5421): 1811-1816. ISSN 0193-4511. PMID 10364548
9. Debanne, D.; Daoudal G., Sourdet V., and Russier M. (2003). "Brain plasticity and ion channels". *Journal of Physiology, Paris* 97 (4-6): 403-414. doi:10.1016/j.jphysparis.2004.01.004. PMID 15242652
10. Song, I.; Huganir R.L. (2002). "Regulation of AMPA receptors during synaptic plasticity". *Trends in Neurosciences* 25 (11): 578-589. doi:10.1016/S0166-2236(02)02270-1
11. Pérez-Otaño, I.; Ehlers M.D. (2005). "Homeostatic plasticity and NMDA receptor trafficking". *Trends in Neurosciences* 28 (5): 229-238. doi:10.1016/j.tins.2005.03.004. PMID 15866197.
12. Shouval, Harel Z.; Gastone C. Castellani, Brian S. Blais, Luk C. Yeung, Leon N. Cooper (2002). "Converging evidence for a simplified biophysical model of synaptic plasticity". *Biological Cybernetics* 87 (5-6): 383-391. doi:10.1007/s00422-002-0362-x. PMID 12461628.

Copyright © - avtorske pravice pridržane MojDih d.o.o.

Središče za Medije | Oddelek za Znanstveno sodelovanje | Pisarna za Prenos tehnologij in licenciranje

Podjetje MojDih d.o.o. je član Ljubljanskega Univerzitetnega Inkubatorja

