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## LES SÉMINAIRES DE L'INMG

# *Skeletal muscle adaptations to exercise : a translational approach*

Par

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<https://www.unil.ch/physiologie/en/home/menuinst/groupes-de-recherche/bengt-kayser---nicolas-place.html>

**Vendredi 2 mars 2018  
11 heures**

**Salle des Conférences  
Médiathèque Paul Zech  
Faculté de Médecine Lyon Est  
8, Avenue Rockefeller  
69008 LYON**

## Abstract :

The amount of force skeletal muscles can produce depends on their contractile history. For instance, repeated contractions generally lead to reduced muscle force generating capacity, namely muscle fatigue. Although muscle fatigue has been the focus of many works in the last 100 years, the underlying mechanisms remain elusive. In this presentation, special emphasis will be given to the role of  $\text{Ca}^{2+}$  handling as a key regulator of (i) muscle weakness and (ii) beneficial adaptations observed after high intensity interval training. In particular, the potential role of the sarcoplasmic reticulum  $\text{Ca}^{2+}$  release channel, the ryanodine receptor type 1, will be discussed.

## Selected publications

1- Cheng AJ, **Place N**, Westerblad H. Molecular Basis for Exercise-Induced Fatigue: The Importance of Strictly Controlled Cellular  $\text{Ca}^{2+}$  Handling. Cold Spring Harb Perspect Med. 2017 Apr 21

2- **Place N**, Ivarsson N, Venckunas T, Neyroud D, Brazaitis M, Cheng AJ, Ochala J, Kamandulis S, Girard S, Volungevičius G, Paužas H, Mekideche A, Kayser B, Martinez-Redondo V, Ruas JL, Bruton J, Truffert A, Lanner JT, Skurvydas A, Westerblad H. Ryanodine receptor fragmentation and sarcoplasmic reticulum  $\text{Ca}^{2+}$  leak after one session of high-intensity interval exercise. Proc Natl Acad Sci U S A. 2015 Dec 15;112(50):15492-7.

3- Cheng AJ, **Place N**, Bruton JD, Holmberg HC, Westerblad H. Doublet discharge stimulation increases sarcoplasmic reticulum  $\text{Ca}^{2+}$  release and improves performance during fatiguing contractions in mouse muscle fibres. J Physiol. 2013 Aug 1;591(15):3739-48.

4- **Place N**, Yamada T, Bruton JD, Westerblad H. Muscle fatigue: from observations in humans to underlying mechanisms studied in intact single muscle fibres. Eur J Appl Physiol. 2010 Sep;110(1):1-15. doi: 10.1007/s00421-010-1480-0. Epub 2010 Apr 24. Review.

5- **Place N**, Yamada T, Zhang SJ, Westerblad H, Bruton JD. High temperature does not alter fatigability in intact mouse skeletal muscle fibres. J Physiol. 2009 Oct 1;587(Pt 19):4717-24. doi: 10.1113/jphysiol.2009.176883. Epub 2009 Aug 12.