



令和元年度 第1回
NCNP国際セミナー



幼若マウス由来の筋衛星細胞が筋形成と筋再生に
果たす役割はマウス系統の違いにより大きく異なる

Dr Terence Partridge (テレンス パートリッジ 博士)

ユニヴァーシティ・カレッジ・ロンドン大学名誉教授、ロンドン、イギリス

日程: 2019年6月7日(金) 14:00~15:00

場所: 教育研修棟1階 ユニバーサルホール1



講演要旨:

Terence Partridge 博士は、ミオパチーにおける筋修復・再生メカニズム解明、並びにデュシェンヌ型筋ジストロフィーに対する筋芽細胞移植とエクソン・スキップ治療法開発において多大な功績を残しています。

Although there is great interest in the idea of driving muscle hypertrophy as a means of counteracting muscle loss in muscular dystrophies or muscle atrophy associated with cancer or old age, we know very little about the cellular processes that underlie change in muscle size. We have developed methods for measuring the two main components of muscle fibre size, the number of muscle fibre nuclei and the amount of sarcoplasm assembled around each muscle fibre nucleus. These methods have been applied in mice to studies of postnatal muscle growth, to the effects of dystrophic muscle pathology and to the muscle hypertrophy induced by treatment with the β -agonist Formoterol.

We show that in 2 week old mice, both normal (WT) and dystrophic, a satellite cells fuses with each EDL muscle fibre every two hours. Beyond 4 weeks WT mouse fibres continue to grow but by only 1 satellite cell fusion per day while in mdx mice there is massive turnover of muscle – 2% per day but that the repaired fibres acquire double the number of myonuclei.

The complete repair of these dystrophic fibres takes place in 2-3 days. Analysis of the dynamics leads us to conclude that muscle growth occurs mainly by serial asymmetric division of satellite cells whereas repair of dystrophic lesions must involve predominantly symmetrical division of committed satellite cells, with no significant part being played by asymmetric division.

Formoterol was found to have independent effects on increasing the satellite cell fusion and the size of muscle fibres that varied with age and disease status of the animal, suggesting that great care is needed in application of hypertrophic therapies to muscle.

担当・連絡先: 神経研究所 遺伝子疾患治療研究部 (内線 5221 青木)