

# 大学院特別講義のご案内

日時: 2015年12月10日(木) 16:30～ 18:00

場所: 口腔科学研究棟5F 弓倉記念ホール

International Symposium 2015

## Oral and Craniofacial Development and Diseases

Plenary lectures

Session Chair: Hiroshi Kurosaka (Osaka Univ.)

### “Neural crest Cells: Evolution, Development and Disease”

**Paul Trainor**

Stowers Institute for Medical Research

Neural crest cells comprise a migratory stem and progenitor cell population that gives rise to a diverse array of cells and tissues throughout the vertebrate body. Neural crest cells (NCC) are considered to be a vertebrate innovation that significantly contributed to their evolution, predation, radiation and adaptation to most niches of the planet. Neural crest cell formation encompasses several steps including induction and specification from a precursor neural stem cell pool, epithelial to mesenchymal transition, acquisition of polarity, delamination and migration from the neural tube. Work in aquatic and avian model systems has uncovered gene regulatory networks mediated by Wnt, BMP and FGF signaling that drive neural crest cell formation. However, knockout mouse models have failed to recapitulate a role for these pathways in mammalian neural crest cell induction. Thus the signals, switches and mechanisms governing neural crest cell formation in mammals remains poorly understood. We have identified novel roles for orphan nuclear receptors in mammalian neural crest induction. Loss-of-function mutants exhibit a maintenance of neural stem cell identity and an inability to differentiate and form neural crest cells. Global gene expression and protein interaction analyses, reveal that orphan nuclear receptors may act as bimodal switches in neural crest cell formation, firstly by repressing pluripotency genes while concomitantly activating neural crest specific genes, and secondly by regulating epithelial to mesenchymal transition. Our findings have identified a novel regulator of mammalian neural crest cell development and defined a temporal window for mammalian neural crest cell formation which is earlier than previously thought and raises important questions regarding the appropriateness of particular Cre mouse lines in studies of mammalian neural crest cell specification and induction.