

公益財団法人 セコム科学技術振興財団
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研究課題名

疾患特異的iPS細胞を用いた難治性軟骨異常増殖病態の解明と再生医療への応用

The investigation of intractable abnormal cartilage proliferative diseases using
disease-specific iPS cells and its application for regenerative medicine

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CINCA syndrome and Ollier disease are characterized with abnormal proliferation of growth plate cartilage due to the somatic mosaicism of disease-causing mutations, although the precise mechanisms are not yet known. The objective of this study is to investigate the molecular pathology of these diseases by inducing cartilage cells from patient-specific iPS cells, which will reveal a new signal related to the growth and differentiation of growth plate and endow us with a new field of cartilage regenerative medicine. As a result, we have succeeded to recapitulate the disease phenotype; abnormal NLRP3 protein inhibited the terminal differentiation and forced abnormal proliferation. Also we found that cAMP, PKA, CREB, and SOX9 pathway is the pathway induced by abnormal NLRP3. In the case of Ollier disease, we have found a new candidate gene by whole exosome analyses of a patient with extensive lesions, and analyzed its function using patient-specific iPS cells.