

学位論文審査結果の要旨

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<p>(学位論文審査結果の要旨)</p> <p>Fluorescent-based methods for gene knockdown and functional cardiac imaging in zebrafish</p> <p>著者らは論文において下記の内容を述べている。</p> <p>A notable advantage of zebrafish as a model organism is the ease of gene knockdown using morpholino antisense oligonucleotide (MO). However, zebrafish morphants injected with MO for a target protein often show heterogeneous phenotypes, despite controlling the injection volume of the MO solution in all embryos. We developed a method for estimating the quantity of MO injected into each living morphant, based on the co-injection of a control MO labeled with the fluorophore lissamine. By applying this method for knockdown of cardiac troponin T (tnnt2a) in zebrafish, we could efficiently select the partial tnnt2a-depleted zebrafish with a decreased heart rate and impairment of cardiac contraction. To investigate cardiac impairment of the tnnt2a morphant, we performed fluorescent cardiac imaging using Bodipy-ceramide. Cardiac image analysis showed moderate reduction of tnnt2a impaired diastolic distensibility and decreased contraction and relaxation velocities. To the best of our knowledge, this is the first report to analyze the role of tnnt2a in cardiac function in tnnt2a-depleted living animals. Our combinatorial approach can be applied for analyzing the molecular function of any protein associated with human cardiac diseases.</p> <p>ゼブラフィッシュの定量的ノックダウン法を確立し、またゼブラフィッシュの蛍光心臓イメージング法を用いることにより、世界で初めて心筋トロポニンTのノックダウンによる心機能障害を定量的に評価したものであり、学術上極めて有益であり、学位論文として価値あるものと認めた。</p>			

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