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Poster Sessions

The usefulness of KCC2 to analyze the effect of irradiation on rodent neuron.

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Radiation therapy (RT) is effective method to remove brain tumors. RT is also applied to pediatric patients, although comorbid adverse events, such as intellectual or cognitive disfunction, is severe problem. To understand the molecular events that occurs after RT will be promising to form pharmaceutical method to ameliorate these disfunctions. We examined the X-ray sensitivity of primary neuronal culture of embryonic rat (embryonic days of 16.5 – 18.5 days) cortex by employing trypan blue exclusion test. We found that the death fraction of cells after irradiation increased. We also performed immunofluorescence staining to detect a K⁺-Cl⁻ co-transporter KCC2, which plays an important role in mediating intracellular Cl⁻ concentration ([Cl⁻]_i), and found that perimembrane KCC2 signals declined, suggesting that decline of KCC2 would result in decrease of [Cl⁻]_i, followed by hyperexcitability. We then testified whether afterward oxytocin administration restore declined KCC2 signals in X-ray irradiated cells and found that 10nM of oxytocin administration restored KCC2. In addition, we performed γ -ray irradiation to head of 10-week-old mice. It was found that KCC2 decreased in mice cortex which were irradiated with 3 Gy γ -ray irradiation by using western blot analysis. Collectively thought from these results, we assume that KCC2 is useful to analyze the effect of irradiation and to examine the afterward restoration by drug administration.