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## Observation of Mitotic Chromosome behavior according to Different Treatment Methods of DNA Methylation Inhibitor

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### [Abstract]

Chromosome breakage occurred by DNA methylation inhibitor. Zebularine is known as DNA methylation inhibitor and suitable for water solubility among different DNA methylation inhibitors as 5-Azacytidine and 5-aza-2'-deoxycytidine. We used zebularine as mutagen according to different methods by roots absorption and seed imbibition. After zebularine treatment, DNA methylation inhibitor, we observed mitotic chromosome behavior what is different according to two different treatment methods. First, seed imbibition treatment in 1,000  $\mu\text{M}$  of zebularine solution for 72 hours in dark conditions. The second treatment to seedlings of Keumkang was also treated in 1,000  $\mu\text{M}$  of zebularine solution for 72 hours after germination. Root and shoot showed different elongations in each treatment. Root absorption treatment ( $3.01 \pm 0.48$ ,  $2.00 \pm 0.26$ ) showed the shortest elongation in root and shoot than control ( $8.16 \pm 0.61$ ,  $4.03 \pm 0.48$ ) and seed imbibition treatment ( $4.33 \pm 0.80$ ,  $2.48 \pm 0.36$ ). It can be explained root tip meristematic cell activity was damaged by DNA methylation inhibitor. Primary root tips were collected in DW for 24 hours at low temperature ( $0^\circ\text{C}$ ) and fixed in fixation solution for 3 days to chromosome observation in mitosis. Mitotic index, chromosome structure and chromosome aberration were observed by phase-contrast microscope. Mitotic index of the control (0.29) showed twice mitotic cells as the treated groups (imbibition 0.15, absorption 0.14). Observation of chromosomes showed some short chromosomes and loosen chromosomes affected by zebularine. It is considered because of zebularine damage DNA in mitosis. We observed "gap by chromosome breakage" in chromosomes that have loose parts between centromere and telomere. It seems demethylation of zebularine occurs chromosome breakage.

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