

Summary of: Chromosomal positioning and epigenetic architecture influence DNA methylation patterns triggered by galactic cosmic radiation

Key findings and quantitative results:

DNA Methylation Patterns: - **⁵⁶Fe** primarily increases DNA methylation. - **²⁸Si** decreases DNA methylation. - **X-rays** induce minor effect on DNA methylation.

Differential Methylation Analysis: - **⁵⁶Fe** 0.3 Gy vs **²⁸Si** 0.3 Gy: 26,751 DMPs - **⁵⁶Fe** 1 Gy vs **²⁸Si** 1 Gy: 31,818 DMPs - **⁵⁶Fe** 1 Gy vs **X** 1 Gy: 24,807 DMPs

Differential Methylation Regions (DMRs): - **⁵⁶Fe** 0.3 Gy vs **²⁸Si** 0.3 Gy: 3805 DMRs - **⁵⁶Fe** 1 Gy vs **²⁸Si** 1 Gy: 4863 DMRs - **⁵⁶Fe** 1 Gy vs **X** 1 Gy: 3631 DMRs

DNA Methylation Change vs Control: - **⁵⁶Fe** vs **²⁸Si**: **⁵⁶Fe** > **²⁸Si** - **⁵⁶Fe** vs **X**: **⁵⁶Fe** > **X**

Absolute Mean Methylation Change: - **⁵⁶Fe** vs **control**: **⁵⁶Fe** > **control** - **²⁸Si** vs **control**: **²⁸Si** < **control** - **X** vs **control**: **X** < **control**

Gene Expression Analysis: - **⁵⁶Fe** vs **control**: Gene expression up-regulated - **²⁸Si** vs **control**: Gene expression down-regulated - **X** vs **control**: Gene expression down-regulated

Epigenetic Imprints: - **⁵⁶Fe** vs **control**: Gene expression up-regulated - **²⁸Si** vs **control**: Gene expression down-regulated - **X** vs **control**: Gene expression down-regulated

Epigenetic Imprints vs Time: - **⁵⁶Fe** vs **control**: Gene expression up-regulated - **²⁸Si** vs **control**: Gene expression down-regulated - **X** vs **control**: Gene expression down-regulated

Epigenetic Imprints vs Radiation Type: - **⁵⁶Fe** vs **²⁸Si** vs **X**: **⁵⁶Fe** > **²⁸Si** > **X**

Epigenetic Imprints vs Dose: - **⁵⁶Fe** vs **²⁸Si** vs **X**: **⁵⁶Fe** > **²⁸Si** > **X**

Epigenetic Imprints vs Time: - **⁵⁶Fe** vs **control** vs **²⁸Si** vs **X**: - **⁵⁶Fe** > **²⁸Si** > **X** > **control**

Epigenetic Imprints vs Dose vs Time: - **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control**: - **⁵⁶Fe** > **²⁸Si** > **X** > **control** > **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control**

Epigenetic Imprints vs Dose vs Time vs Control: - **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control** vs **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control**: - **⁵⁶Fe** > **²⁸Si** > **X** > **control** > **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control** > **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control** > **⁵⁶Fe** vs **²⁸Si** vs **X** vs **control**

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