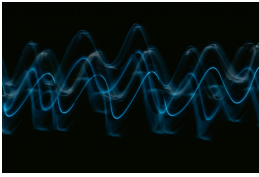


Effect Of Audio On Human Cells

written by Anita Banerjee | July 1, 2025



Studies indicate that sound, particularly music, can influence cell viability, motility, and gene expression across various cell types. This response is not limited to auditory cells; non-auditory cells also exhibit significant reactions to sound stimuli. Sound can effect on cell viability, mechanotransduction, and physiological responses, highlighting the potential therapeutic applications of these findings.

Effects on cell viability and motility

Research has demonstrated that exposure to music can alter the viability and motility of human non-auditory cells. In a study by Lestard and Capella, it was found that acoustic vibrations, in the form of music, can induce mechanisms leading to cell growth arrest or death, similar to effects observed in auditory cells(Lestard & Capella, 2016).

Cell Growth Arrest: The study indicated that specific frequencies and types of music could lead to a significant reduction in cell proliferation.

Cell Motility: Music exposure was shown to enhance or inhibit the movement of cells, suggesting that sound can modulate cellular behavior.

Mechanotransduction and gene expression

Kumeta et al. explored the mechanotransductive properties of sound, revealing that audible sound can suppress mechanosensitive genes in a cell type-specific manner(Kumeta et al., 2018).

Sound Parameters: The study highlighted that the effects of sound depend on various parameters, including waveform and pressure level, rather than frequency alone.

Cell Type Specificity: Different cell lines exhibited varying responses; for instance, ST2 stromal cells showed a robust response, while neuroblastoma cells were largely insensitive.

Physiological responses to sound

Exbrayat and Brun reviewed the physiological effects of sound on various organisms, noting that sound vibrations can influence growth, apoptosis, and immune responses in cells(Exbrayat & Brun, 2019).

Apoptosis and Immune Response: Sound exposure has been linked to changes in apoptosis rates and immune cell activity, indicating a broader impact on cellular health.

Therapeutic Potential: The modulation of physiological processes through sound presents potential therapeutic applications, particularly in enhancing recovery and promoting health.

Blood cell dynamics

A preliminary study on the effects of sound immersion on blood cells found that sound stimuli significantly improved the longevity of red and white blood cells("Effects of Sound Immersion on In Vitro Blood Cells", 2023).

Frequency Effects: Different frequencies (e.g., 40 Hz and 73 Hz) were shown to have distinct effects on blood cell longevity and functionality.

Non-invasive Interventions: These findings suggest that sound could be used as a non-invasive method to enhance blood cell health, potentially benefiting transfusion practices.

In contrast to the positive effects of sound on cellular functions, some studies indicate that excessive or inappropriate sound exposure can lead to stress responses in cells, potentially resulting in detrimental effects. This highlights the need for further research to delineate the conditions under which sound can be beneficial or harmful to cellular health.

Bibliography

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