

# Intercellular communication: From 'cable-phone' to 'cell-phone'?

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Secreted microRNAs (miRNAs) from cells to blood maybe the novel class of signaling molecules mediating intercellular/interorgan communication. A research article, published this week in *Molecular Cell*, reports that miRNA can be secreted from one type of cells and delivered into recipient cells, decreases targeted gene expression, thus, regulates recipient cell function.

MiRNAs are a class of naturally occurring small non-coding RNAs that have been linked to biological processes and diseases development. In the previous study, Chen-Yu Zhang and colleagues reported that expression profile of circulating miRNAs in human and other animals are the novel class of biomarkers for diagnosis of cancer and other diseases. As the consequent work, the same research team has investigated the source of circulating miRNAs. Chen-Yu Zhang and colleagues demonstrate that cell selectively packages miRNA into microvesicles when cell responses to different stimuli. The selective packaging is an essential point of specificity of cellular secretion of miRNAs. The research team also demonstrates that these secreted miRNAs can be delivered into target cells and can modulate the biological functions of these cells via repression of miRNA target gene expression.

"Since their discovery in *C. elegans* 15 years ago, miRNAs have been implicated in a wide array of cellular and developmental processes. To date, more than 500 miRNAs are predicted to be expressed in humans and nearly 30% of genes are predicted to be regulated by miRNAs. The

present study extends our understanding of the role of miRNAs by illustrating that miRNAs can be secreted and delivered into target cells and that these exogenous miRNAs can alter the [cellular functions](#) of the recipient cells by modulating the expression of their [target genes](#)," said Chen-Yu Zhang. "From this point of view, secreted miRNAs represent a novel class of signaling molecules that play an important role in mediating cell-to-cell and organ-to-organ communication." Moreover, the [secretion](#) and targeting of miRNAs establishes a highly regulated complex network under various physiological and pathophysiological conditions.

"Compared to classic cellular communications mediated by hormone/cytokine-receptor and antigen-antibody interactions that generally occur only in certain types of cells, involve a single or few molecules, and affect target cells in a "one-way" fashion, secreted miRNA-based cell communication has the potential to function for every type of cell, to deliver many types of miRNAs with each miRNA targeting multiple genes, and to affect [target cells](#) in "two-way" or "multi-way" fashion. Investigating this secreted miRNA-mediated shift of cell communication from a "cable telephone" to "cell phone" fashion would help us to further understand the nature of biological signaling, discover novel mechanisms of disease and develop new therapeutic strategies," added by co-author Ke Zen.

**More information:** Zhang et al.: "Secreted monocytic miR-150 enhances targeted endothelial cell migration" Publishing in Molecular Cell, July 9th 2010.

Provided by Nanjing University School of Life Sciences

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