# Nanoneedles for Intracellular Sensing and Delivery

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Nanoneedles uniquely enable access to the cell with minimal perturbation, providing an appealing opportunity for nonimmunogenic delivery of labile biologicals and noninvasive sampling of intracellular material. This talk will outline our progresses in building a nanoneedle platform for topical delivery of nucleic acid therapies to epithelia and endothelia for regulation of gene expression and gene editing. It will further describe our recent advances in developing nanoneedles as a platform for spatial biology.

## References

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[2] Tutorial: using nanoneedles for intracellular delivery, Chiappini, C., Chen, Y., Aslanoglou, S., Mariano, A., Mollo, V., Mu, H., De Rosa, E., He, G., Tasciotti, E., Xie, X., Santoro, F., Zhao, W., Voelcker, N. H. & Elnathan, R., Oct 2021, In: Nature Protocols. 16, 10, p. 4539-4563

[3] Biodegradable silicon nanoneedles delivering nucleic acids intracellularly induce localized in vivo neovascularization, Chiappini, C., De Rosa, E., Martinez, J. O., Liu, X., Steele, J., Stevens, M. M. & Tasciotti, E., 1 May 2015, In: NATURE MATERIALS. 14, 5, p. 532-539

## Figures

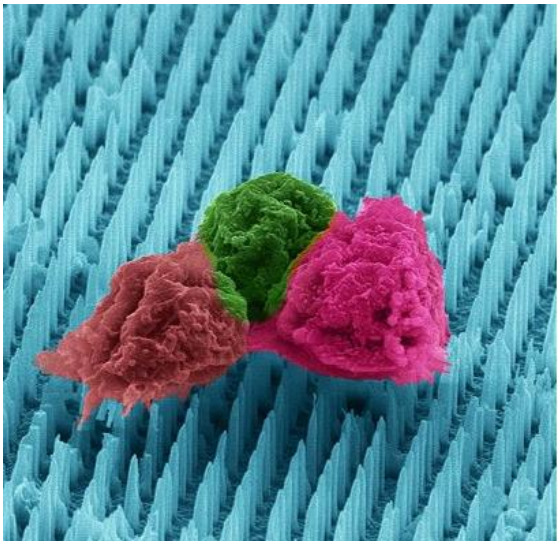

**Figure 1:** Scanning Electron Micrograph of three cells on nanoneedles.