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Dental pulp stem cells as anticancer drug delivery system

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Due to the lack of anticancer drug's specificity, side effects of chemotherapy in cancer treatments are unavoidable and it has an impact on patient quality of life. Over the past 30 years, increasing efforts are done to optimize chemotherapy dosing to reduce drug toxicity while increasing its efficacy. A new study proves that the stem cells can act as a drug reservoir and they will release anticancer drug in its original form in nearby area of cancer cells. Stem cells, due to their capacity to uptake drug, can control the drug toxicity. Dental Pulp Stem Cells DPSCs are able to uptake Paclitaxel PTX and could release it in the culture medium gradually. The conditioned culture medium (culture medium plus released PTX from DPSC) is transferred to the breast cancer cells MCF7. Visualizing the drug uptake intracellular could provide us mechanism of action of the drug. Applying Confocal Raman Microscopy, anticancer drug uptake by MCF7 is imaged. Surprisingly MCF7 -without any direct contact with PTX- showed drug uptake. It proves that stem cells carry and deliver anticancer drug without modifying it. It could be a revolution in chemotherapy to avoid the side effects and increase the drug efficacy.

Biography

Hamideh Salehi is working as Associate Professor at University of Montpellier, France and is working on the imaging of stem cells and cancer cells in different fields such as drug delivery, regenerative medicine and tissue imaging. She was previously a Post-doctoral fellow in Biomedical Engineering at Beckman Laser Institute at University of California Irvine, USA. She did research on lipid imaging in apoptotic cancer cells by Coherent Raman Spectroscopy CARS/SRS. She did her PhD in Nano Biophysics at University of Montpellier 1, France. She has obtained two Master's degrees, the first in Solid State Physics- Photonics Crystal- and the second Mechanical Engineering -Shape Memory Polymers - in ENSAM, ParisTech.

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