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Diamond based relaxometry for biosensing

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Propositions

Diamond based relaxometry for biosensing

Rokshana Sharmin

1. CO₂ and pH of the culture medium affect the nanoparticle uptake into cells in the microenvironment. (This thesis)
2. Cell morphology influences the nanoparticle uptake. (This thesis)
3. HUVECs experiencing shear stress within the physiological range or gradually increased shear stress from the venous to arterial range (2 to 20 dyn/cm²) retain a similar number of nanoparticles (FNDs). (This thesis)
4. Sudden exposure of cells beyond the physiological range of shear stress causes a shock, cells decrease NO* production and fail to maintain their physiological function. (This thesis)
5. Sudden exposure of cells to shear stress within the physiological range increases NO* synthesis and maintains the physiological function. (This thesis)
6. HUVECS adapt when shear stress is gradually increased from the venous to the arterial range (2 to 20 dyn/cm²). They increase NO* synthesis and maintain physiological function. (This thesis)
7. FNDs can distinguish free radical generation in different organelles of a cell. (This thesis)
8. SV40NLS (Nuclear localization signal) conjugated FNDs are targeted to the nucleus. (This thesis)
9. APAP (Acetaminophen) induced free radical generation depends on the concentration of the drug, duration of treatment and the organelle where this is measured. (This thesis)