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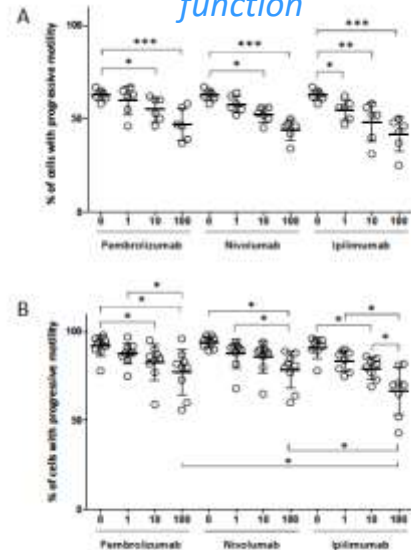
DIDAS - SERVIZI DI DIAGNOSTICA INTEGRATA
UOC ANDROLOGIA E MEDICINA DELLA RIPRODUZIONE
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Anti-CTLA-4 and anti-PD-1 Immune Checkpoint Inhibitor Antibodies impair human sperm motility in-vitro

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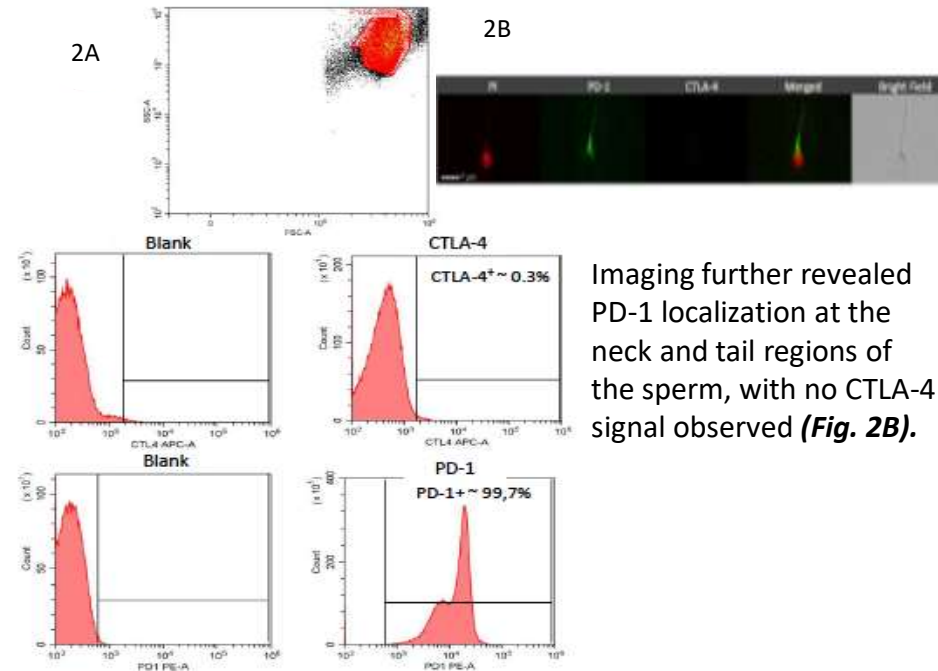
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Treatment of semen sample with Pembrolizumab Nivolumab and Ipilimumab (1-100ng/ml) and the impact on sperm function



Significant decline in progressive sperm motility, with Pembrolizumab and Nivolumab at ≥ 10 ng/ml and Ipilimumab at 1 ng/ml in native semen and in highly motile sperm selected by swim-up technique (Fig. A-B).

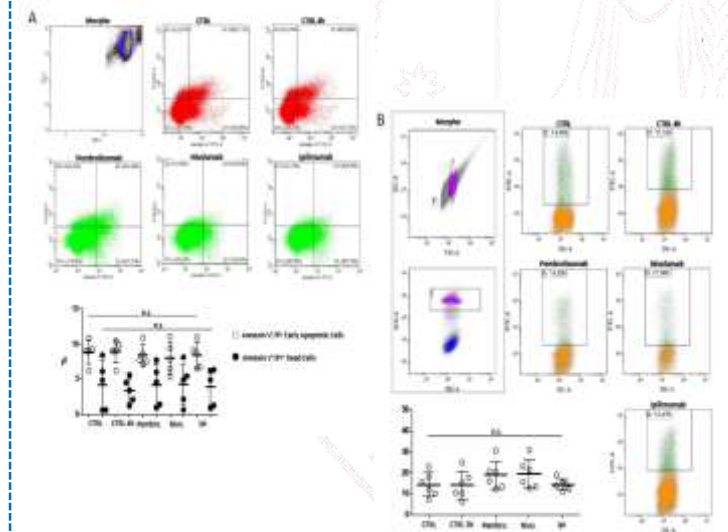
Phenotypic characterization of spermatozoa for CTLA-4 and PD-1 expression



Imaging further revealed PD-1 localization at the neck and tail regions of the sperm, with no CTLA-4 signal observed (Fig. 2B).

In sperm cells, PD-1 was strongly expressed across the entire population, while CTLA-4 was undetectable (Fig. 2A).

Effect of exposure to Immune checkpoint inhibitor antibodies on sperm viability



No significant differences in apoptotic or DNA fragmented cells were found compared to controls ($P > 0.05$) (Fig 3A,3B).