

**Tecnologie per la
Manipolazione su Scala
Nanometrica dei Materiali e
loro Applicazione
Biomedica**

ENDOTELIO e WP2

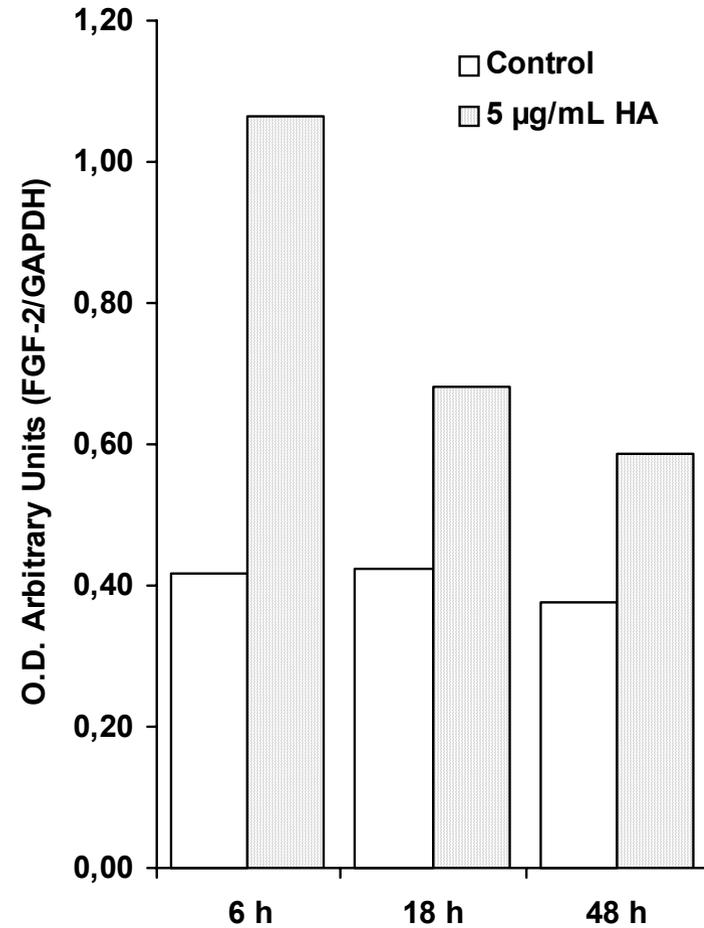
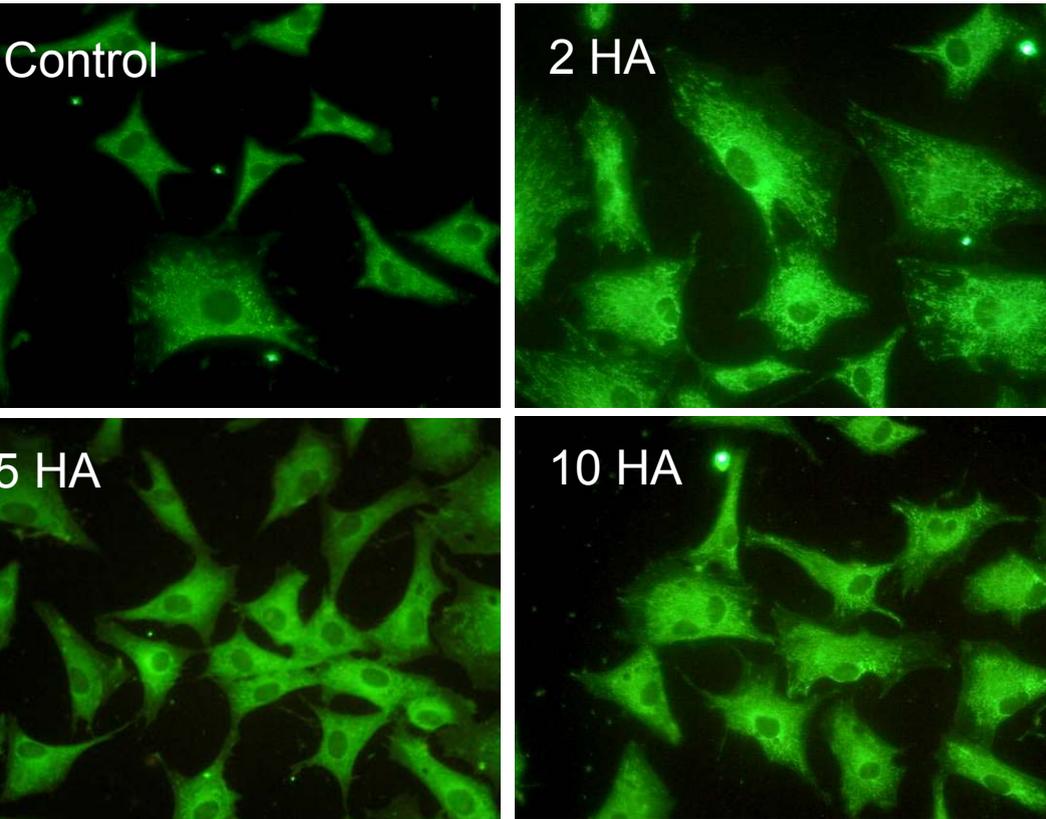
Prof. Ziche

Bari, 10 Febbraio 2006

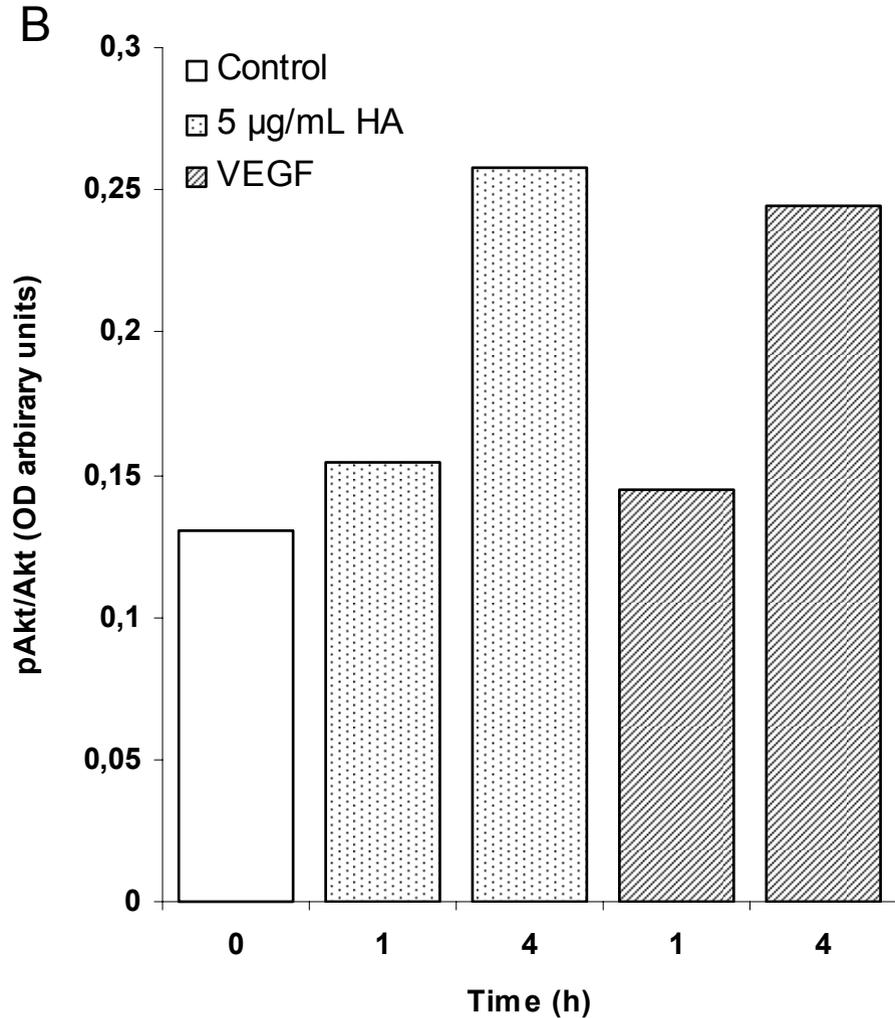
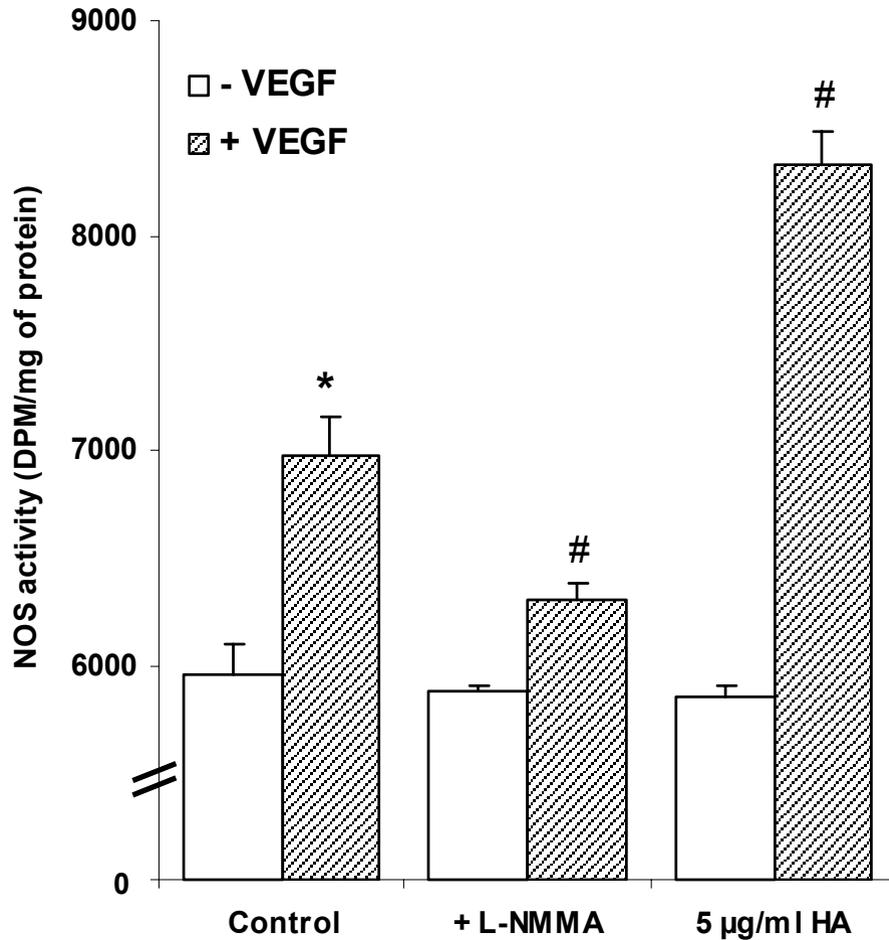
Nanocristalli di HA

- **BIOMATERIALI ANALIZZATI:** nanocristalli di HA
- **CELLULE UTILIZZATE:** CVEC (Coronary Venular Endothelial Cells)
- **CONDIZIONI SPERIMENTALI:** cellule cresciute in medium con 10% siero
- **TEST BIOLOGICI**
 - Espressione del FGF-2
 - NOS activity
 - AKT expression
- **CONCLUSIONI**
 - I nanocristalli di HA sono in grado di stimolare le funzioni endoteliali implicate nel processo angiogenico (sopravvivenza, migrazione, espressione di NOS e FGF-2).
 - In stesura un secondo paper per Bone

FGF-2 expression in CVEC



NOS activity and AKT expression



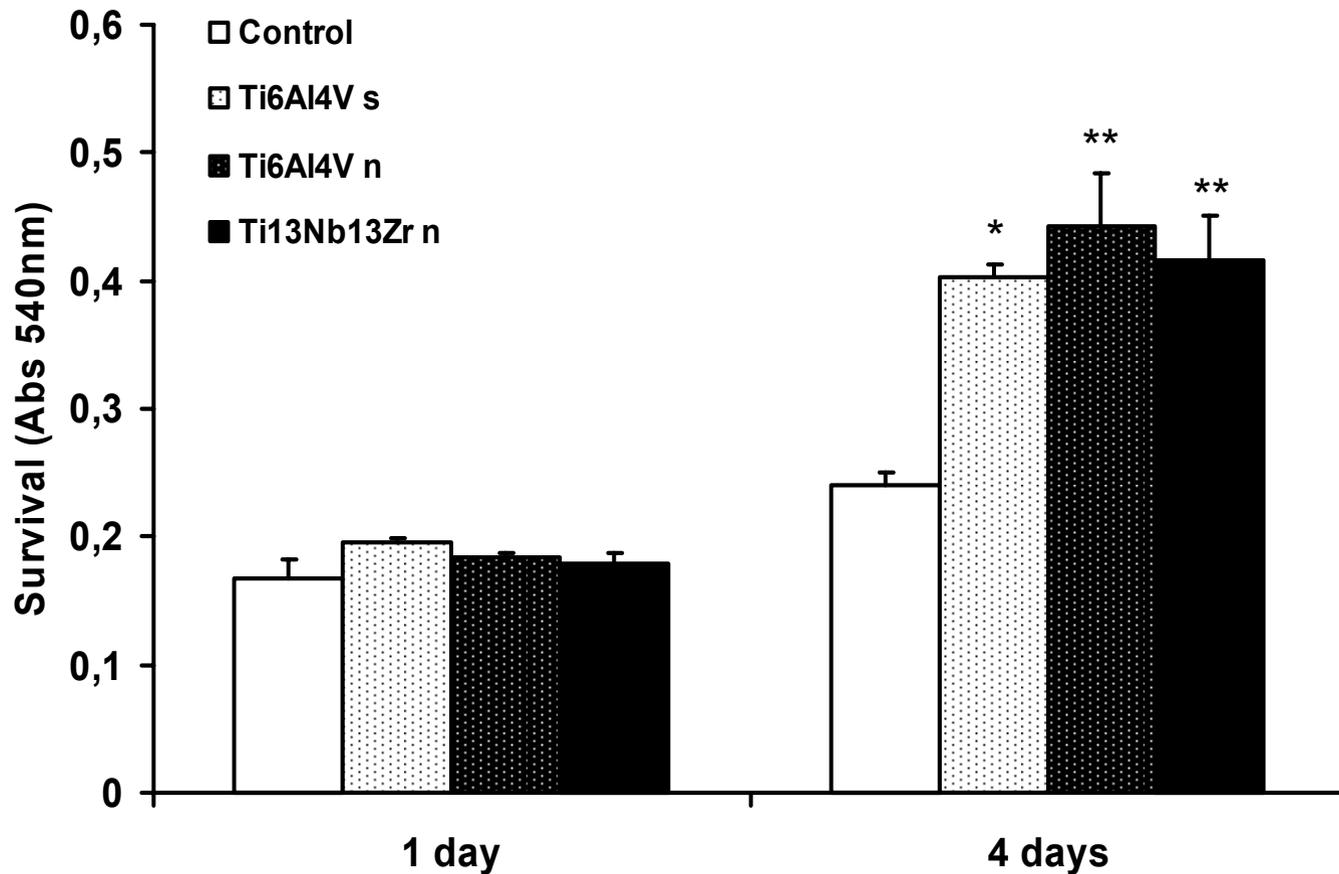
Leghe di Titanio

- **BIOMATERIALI ANALIZZATI:** LEGHE standard e nanostrutturate:
 - Ti6Al4V standard
 - Ti6Al4V nanostrutturata
 - Ti13Nb13Zr nanostrutturata
- **CELLULE UTILIZZATE:** CVEC (Coronary Venular Endothelial Cells)
- **CONDIZIONI SPERIMENTALI:** cellule cresciute in medium con 10% siero a tempi diversi in funzione del protocollo sperimentale

Sopravvivenza cellulare

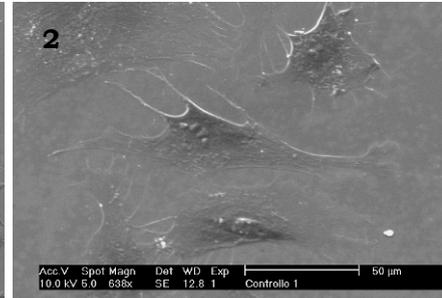
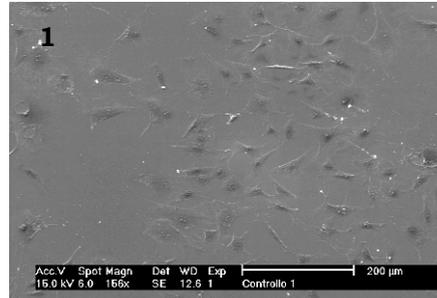
MTT TEST

A

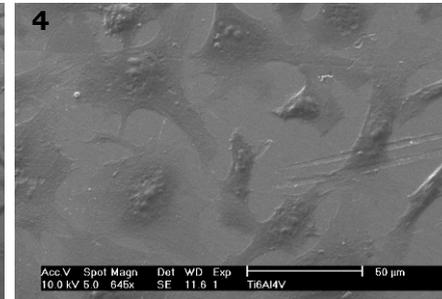
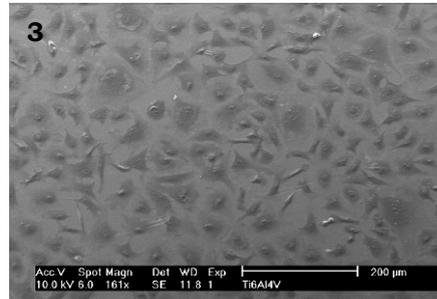


SEM a 4 giorni

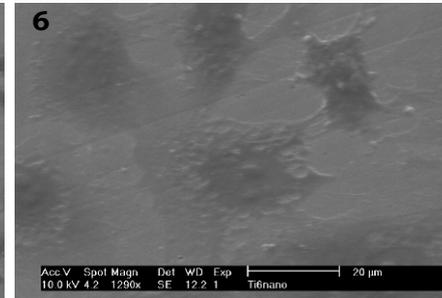
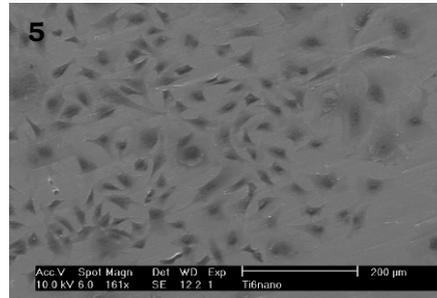
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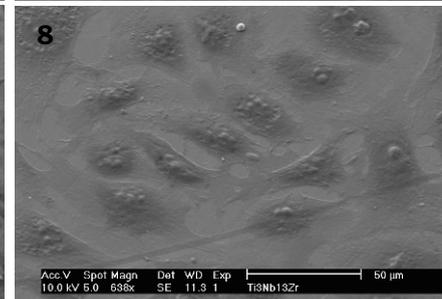
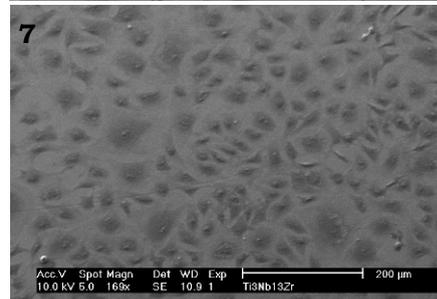
Ti6Al4V



Ti6Al4V nano



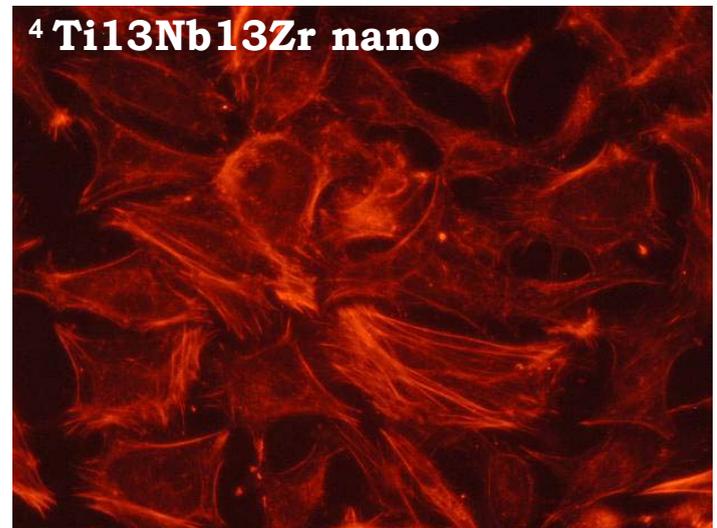
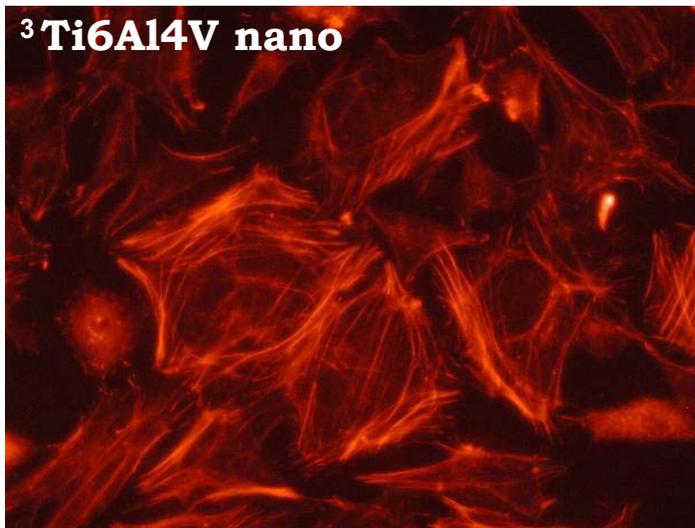
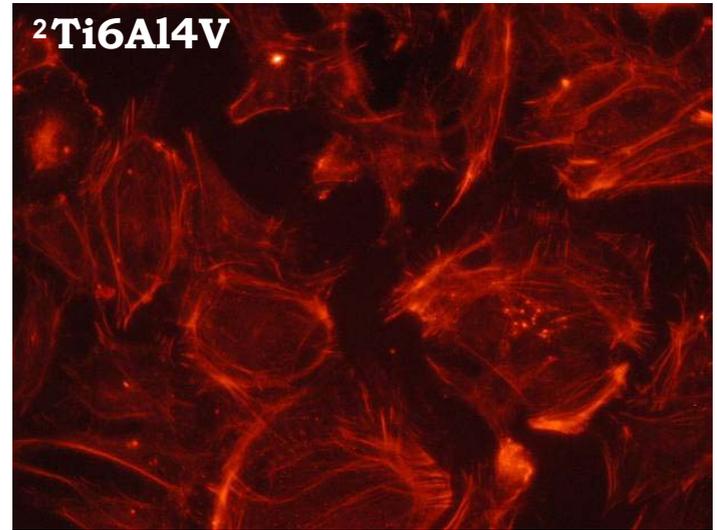
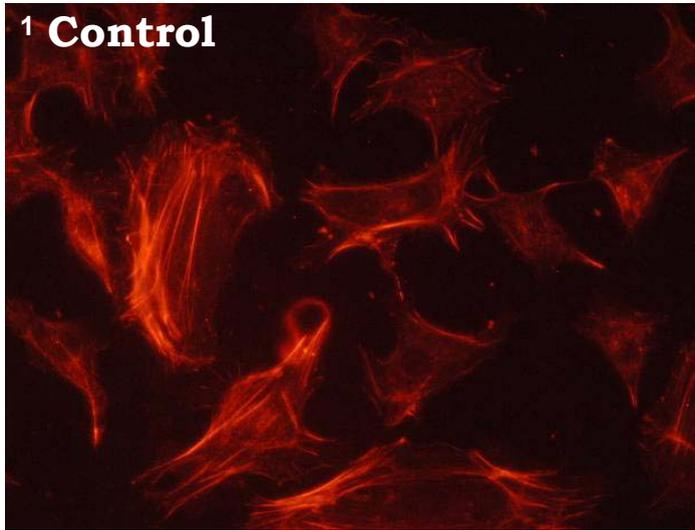
Ti13Nb13Zr nano



ESPRESSIONE β -ACTINA

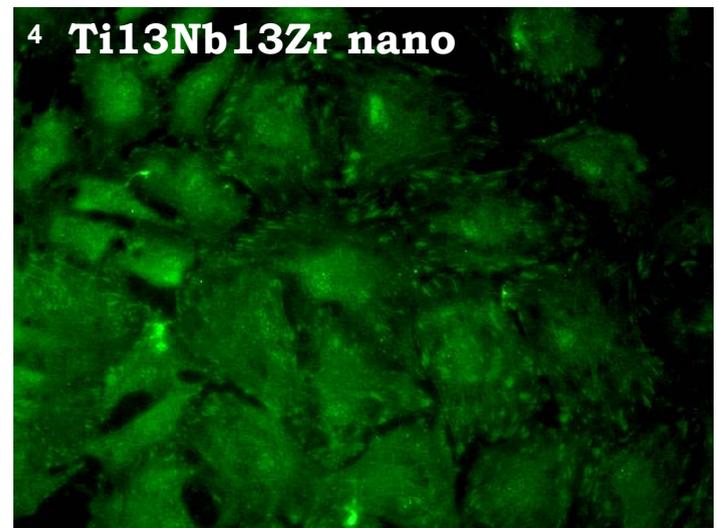
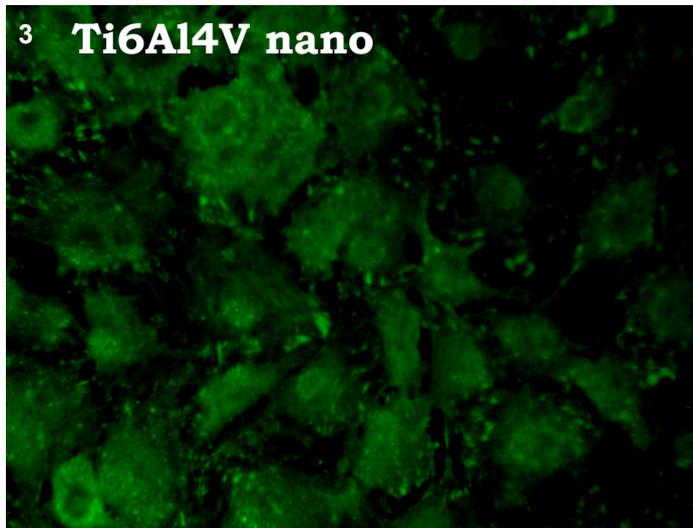
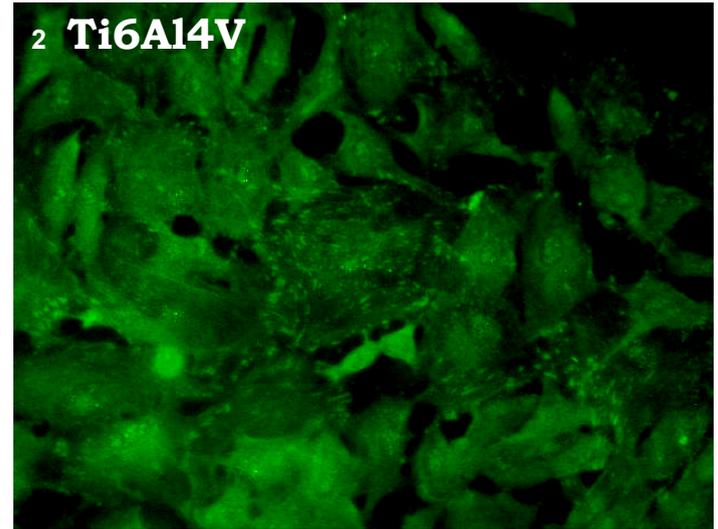
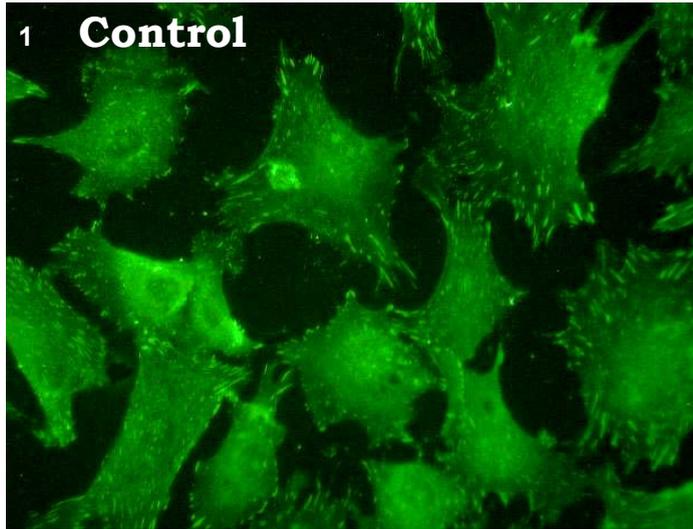
Fig. 2

A



Espressione $\alpha_v\beta_3$ integrina

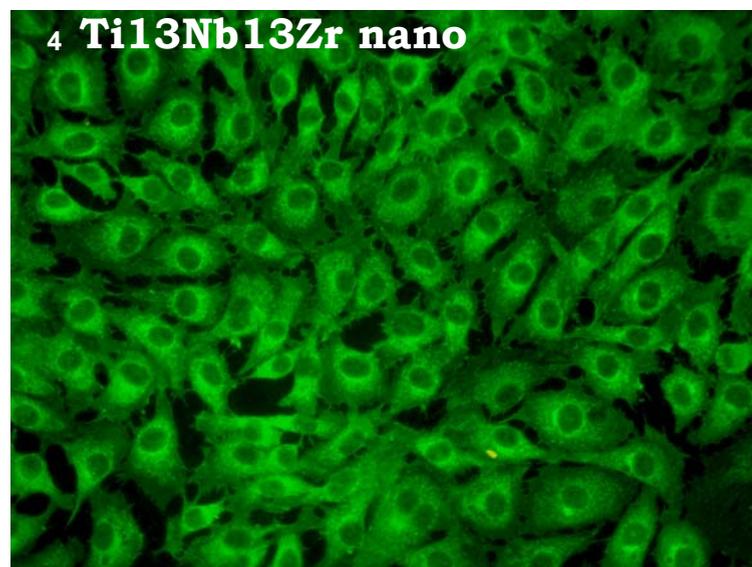
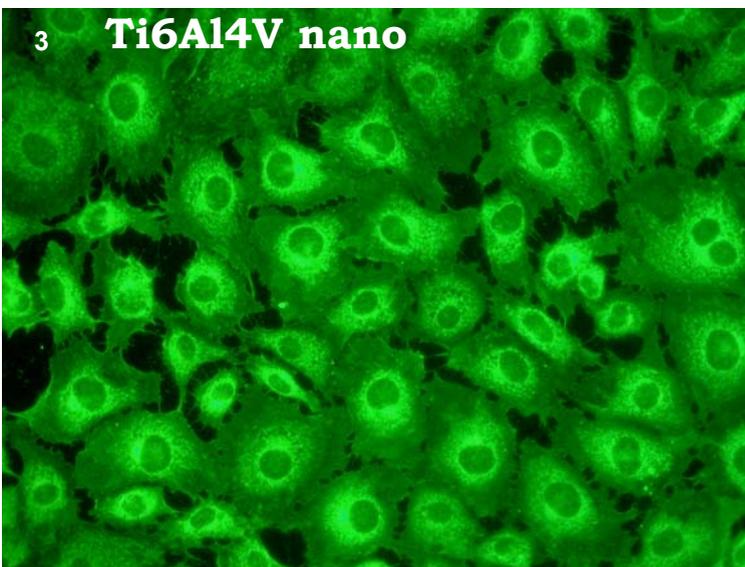
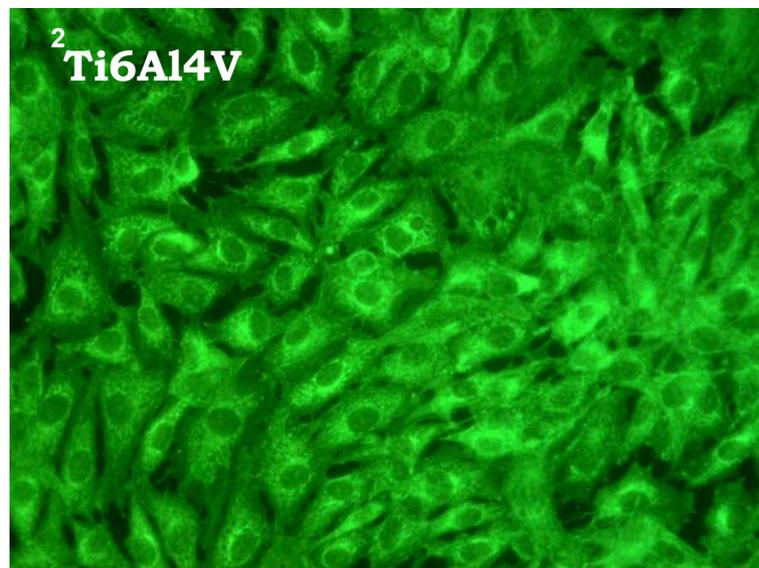
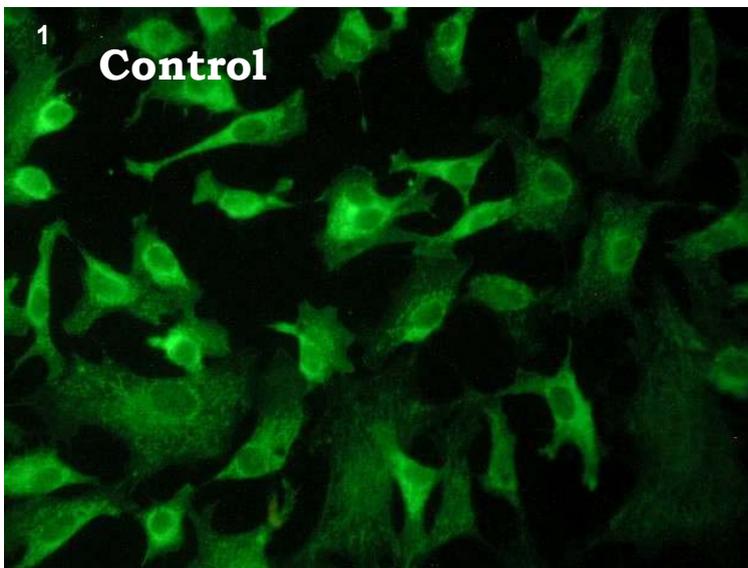
B



ESPRESSIONE ec-NOS

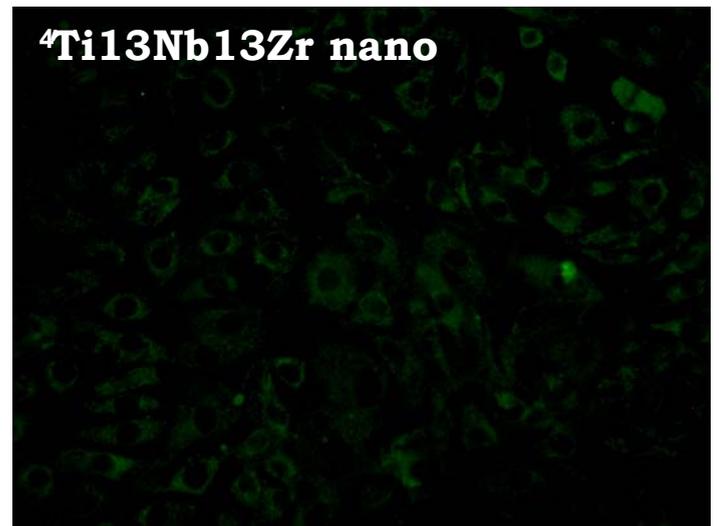
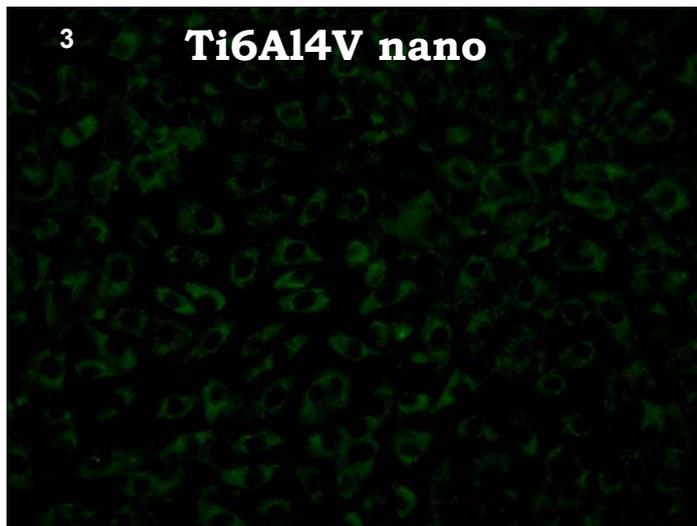
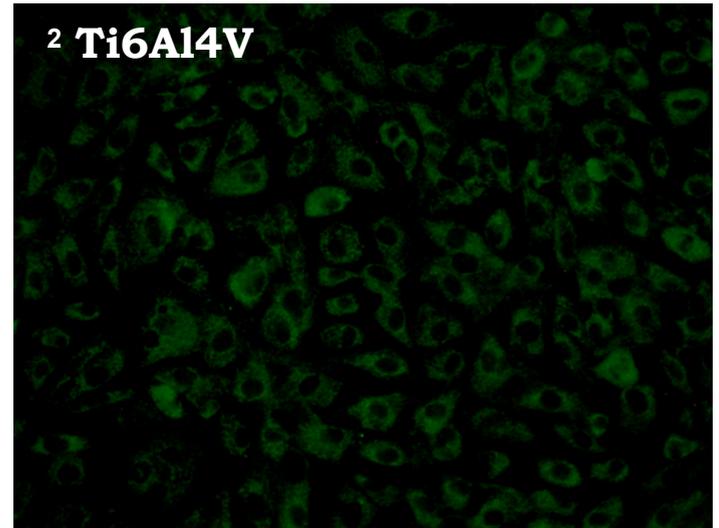
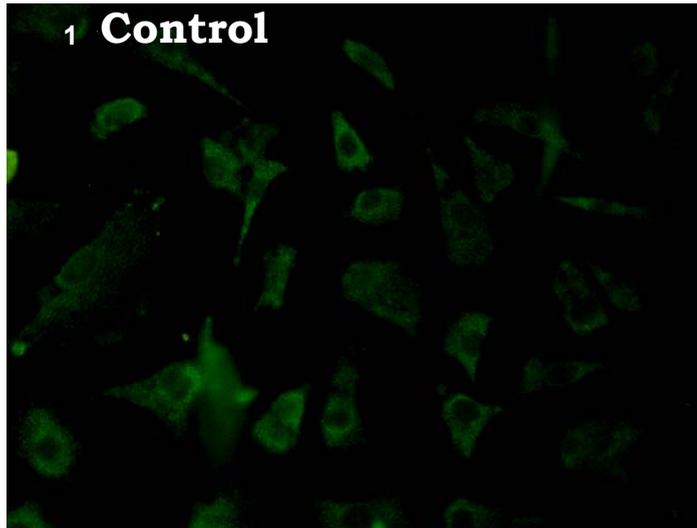
Fig. 3

A



ESPRESSIONE COX-2

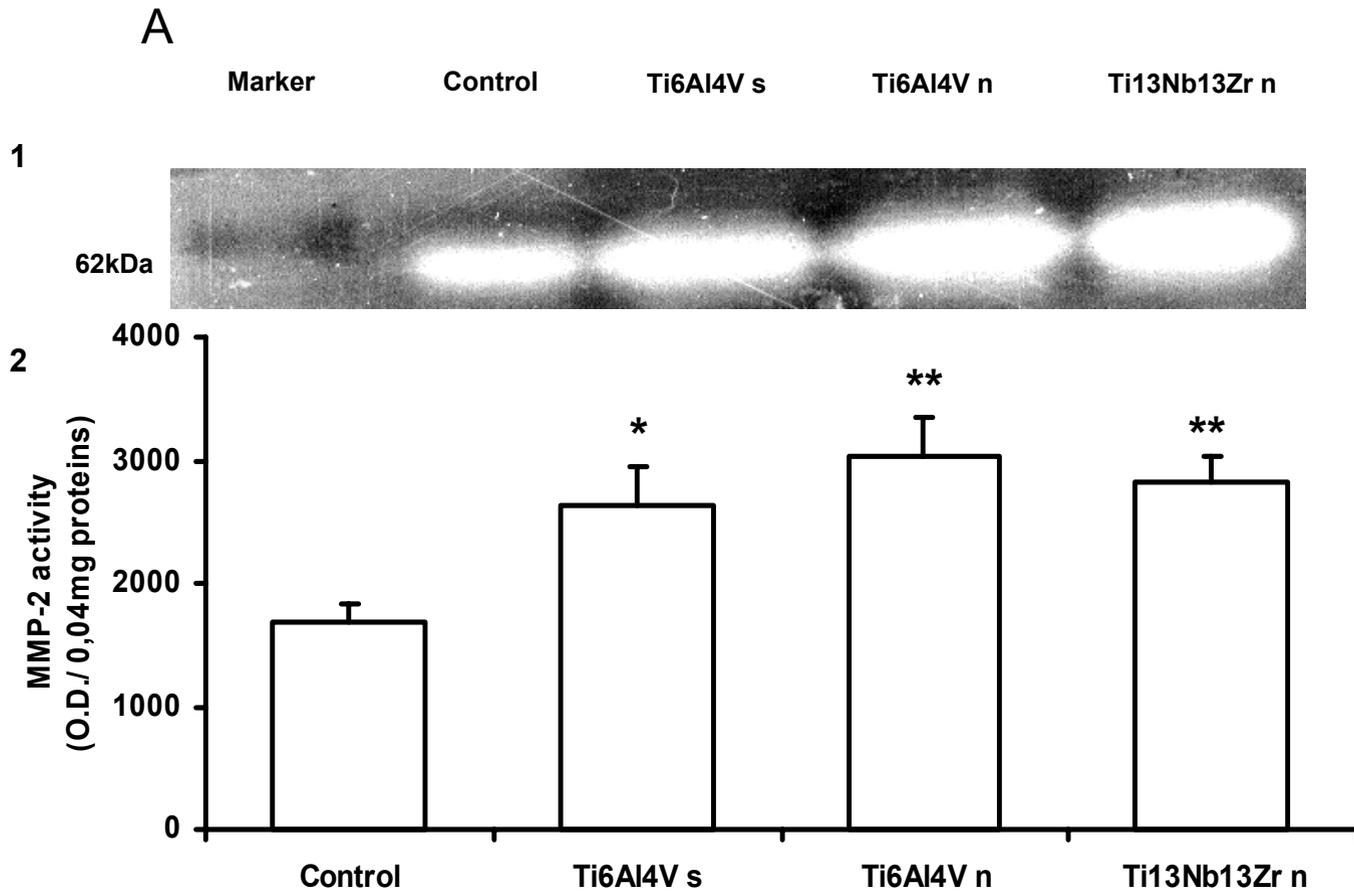
B



Attività MMP-2 (4 giorni)

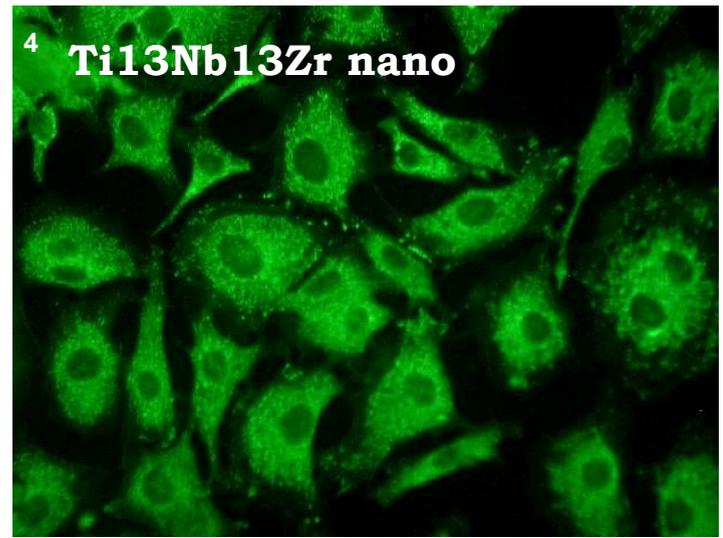
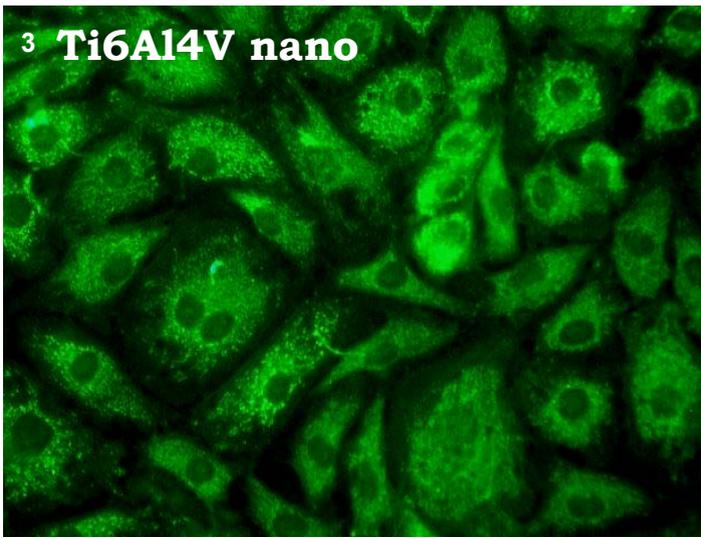
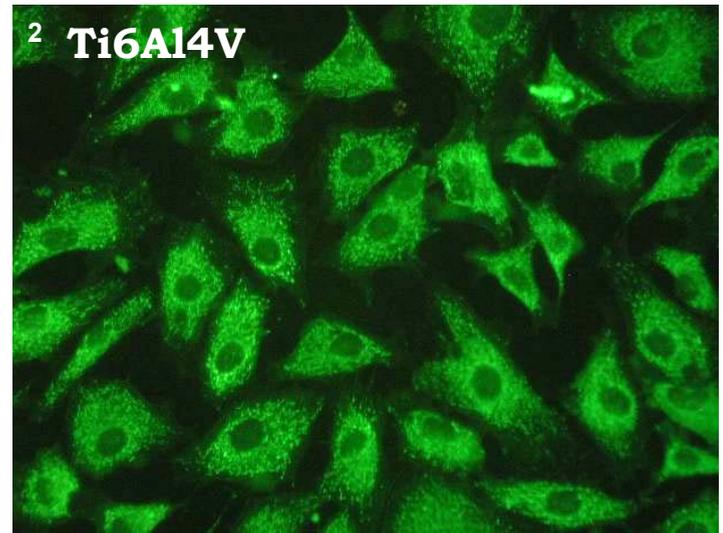
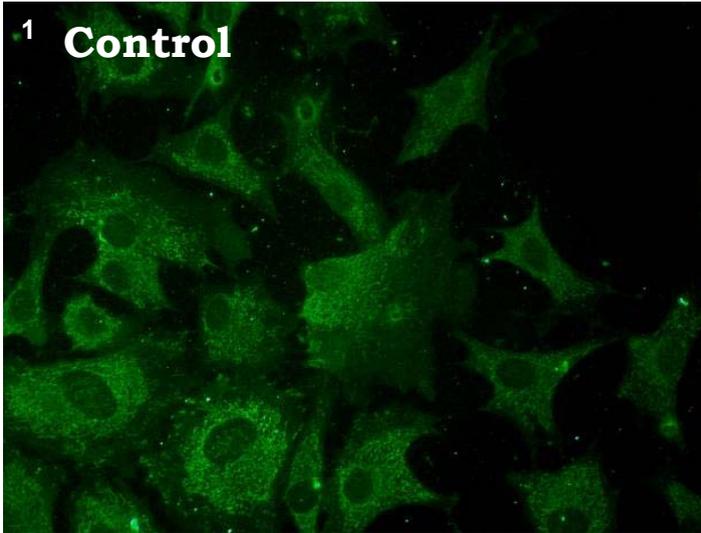
Zimografia

Fig. 4



ESPRESSIONE FGF-2

B



CONCLUSIONI:

- le leghe stimolano lo spreading delle cellule endoteliali
- non inducono l'espressione dei parametri pro-infiammatori e mantengono la funzionalità vascolare.
- Complessivamente si nota l'induzione di un fenotipo angiogenico.
- entrambe le leghe nanostrutturate mostrano una migliore biocompatibilità rispetto alla lega standard