

# Nano-pathophysiology: Intractability due to structural characteristics in disease foci limiting drug delivery

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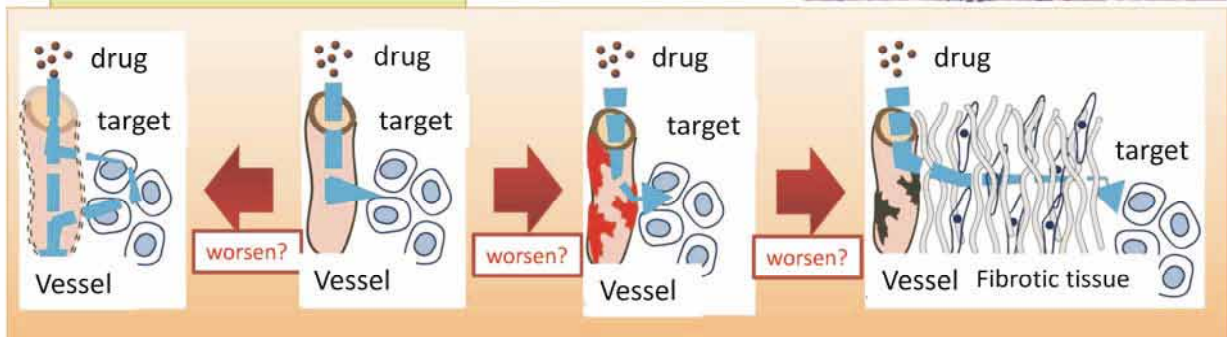
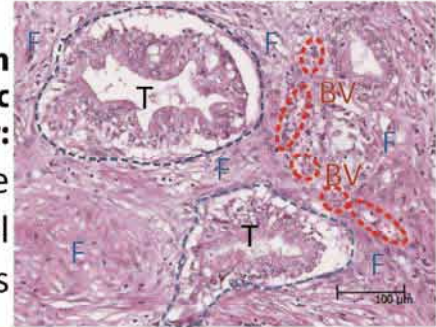
## Revealing why a disease is hard to be treated with medication

Not only cellular response, but pathway that drug travels, matters

**Systemic administration (of esp. nanoparticle)**  
**→vascular lumen**  
**→vascular wall**  
**→fibrotic tissue**  
**→target cells**

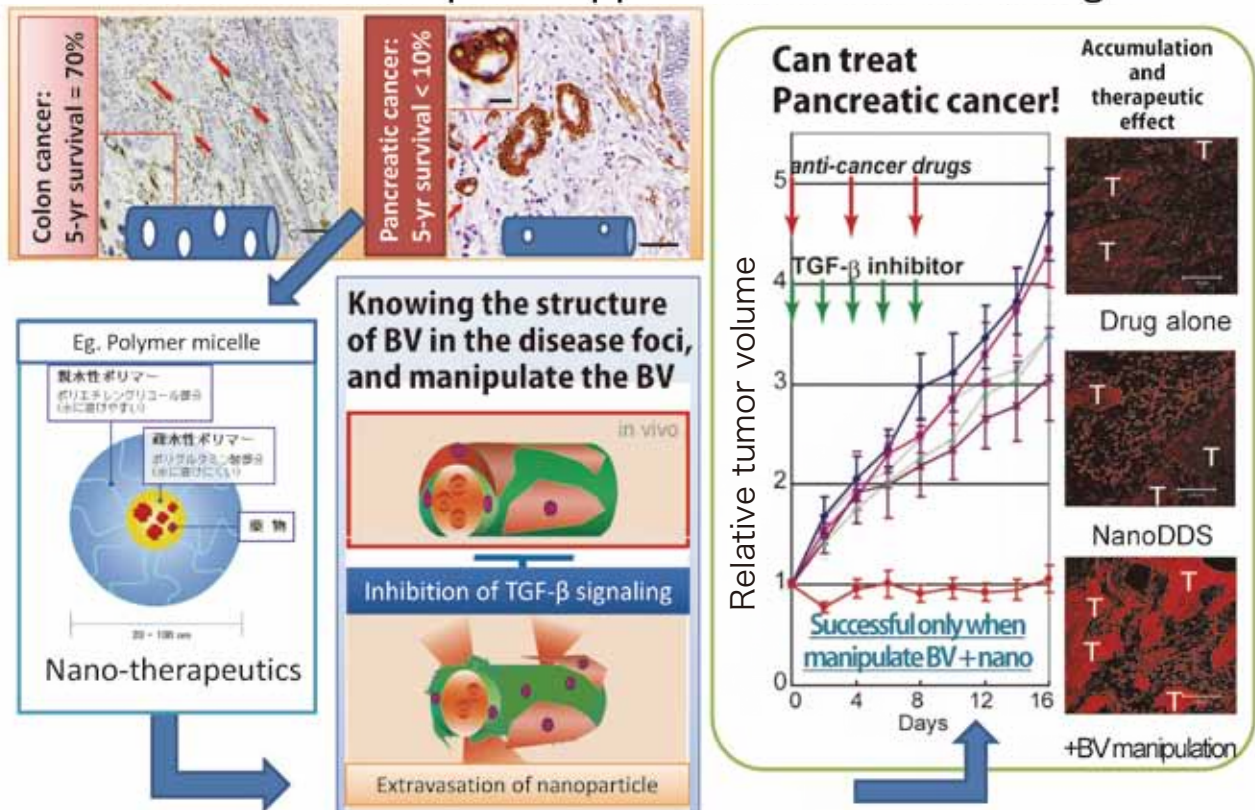
**Pathologic specimen of human pancreatic cancer:**

F: fibrotic tissue  
 BV: blood vessel  
 T: tumor cells



## Indispensable knowledge for the success of nano-therapeutics!

A successful example of application of the knowledge



Kano, Adv Drug Deliv Rev 2014, Kano et al PNAS 2007, Cabral and Kano et al, Nat Nanotech 2011 etc