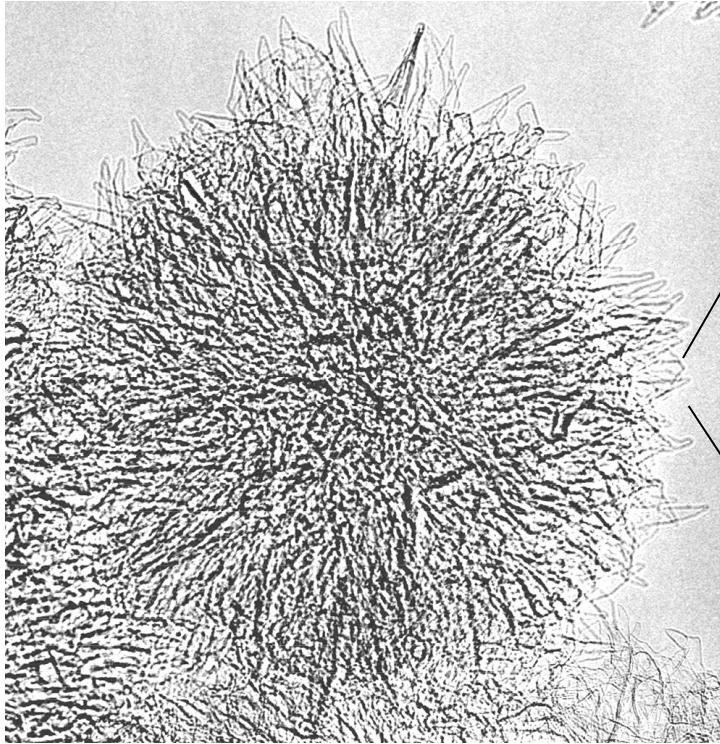
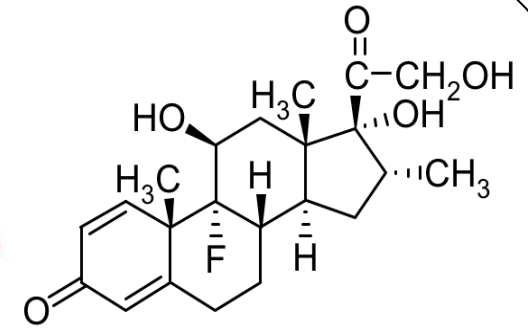
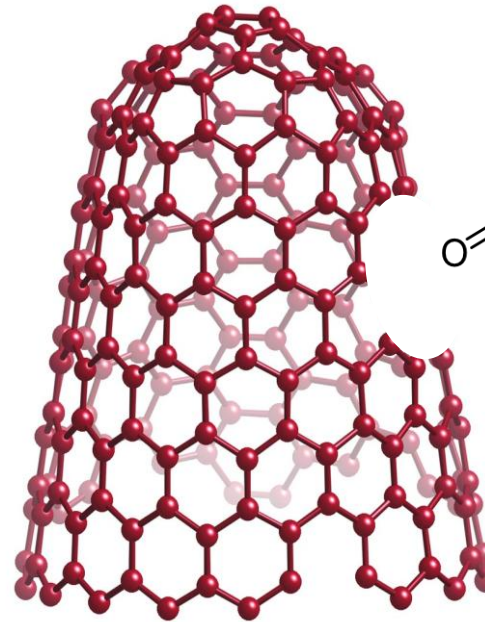


ナノホーンのDDS

Drug (Dexamethasone) incorporation



50 nm



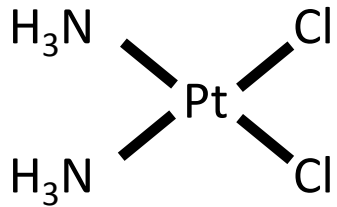
Dexamethasone

- An anti-inflammatory agent
- An osteoblastic differentiation-inducing agent

Murakami et al.

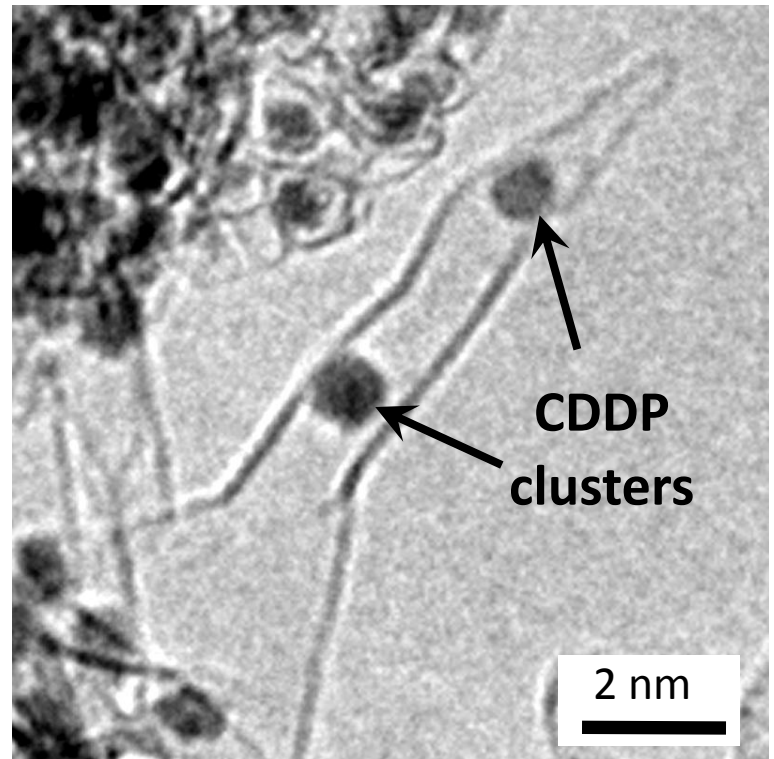
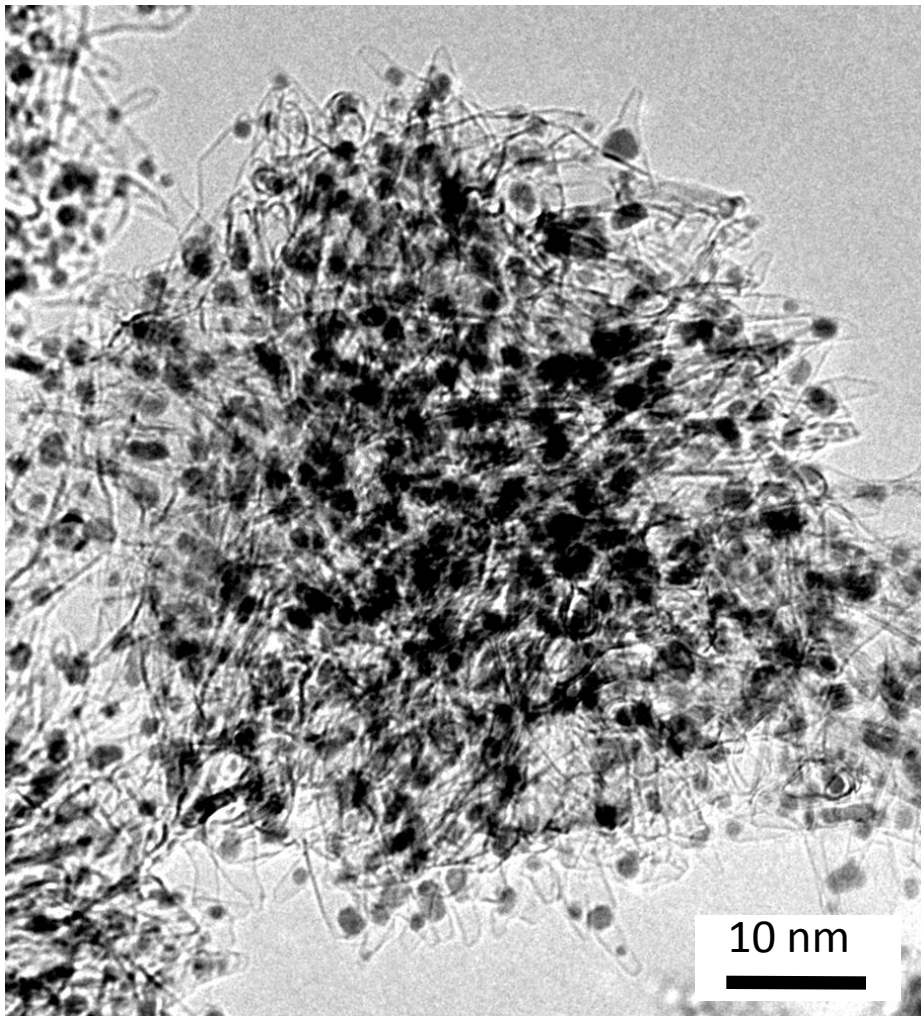
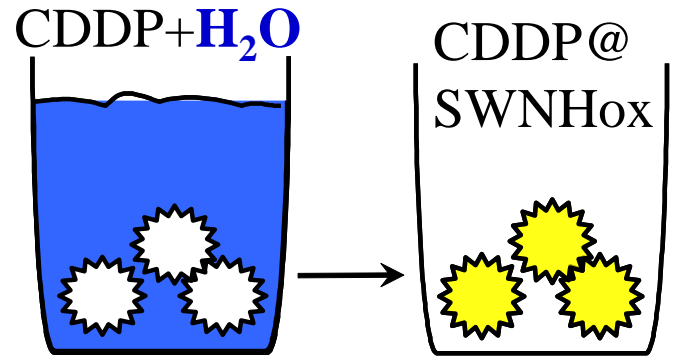
Molecular Pharmaceutics **1**(2004)399-405.

TEM images of CDDP@SWNHox



CDDP: 50wt%

Ajima, Murakami et al, ACSNano 2008

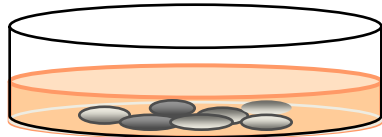


Anticancer effects of CDDP@NH(H₂O) *in vitro*

Viability of human lung cancer cell (H460) assayed by WST-1

CDDP@NH(H₂O) contained 50wt% of CDDP.

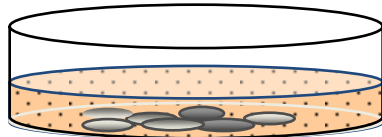
Incubation of H460 at
37°C in 5% CO₂



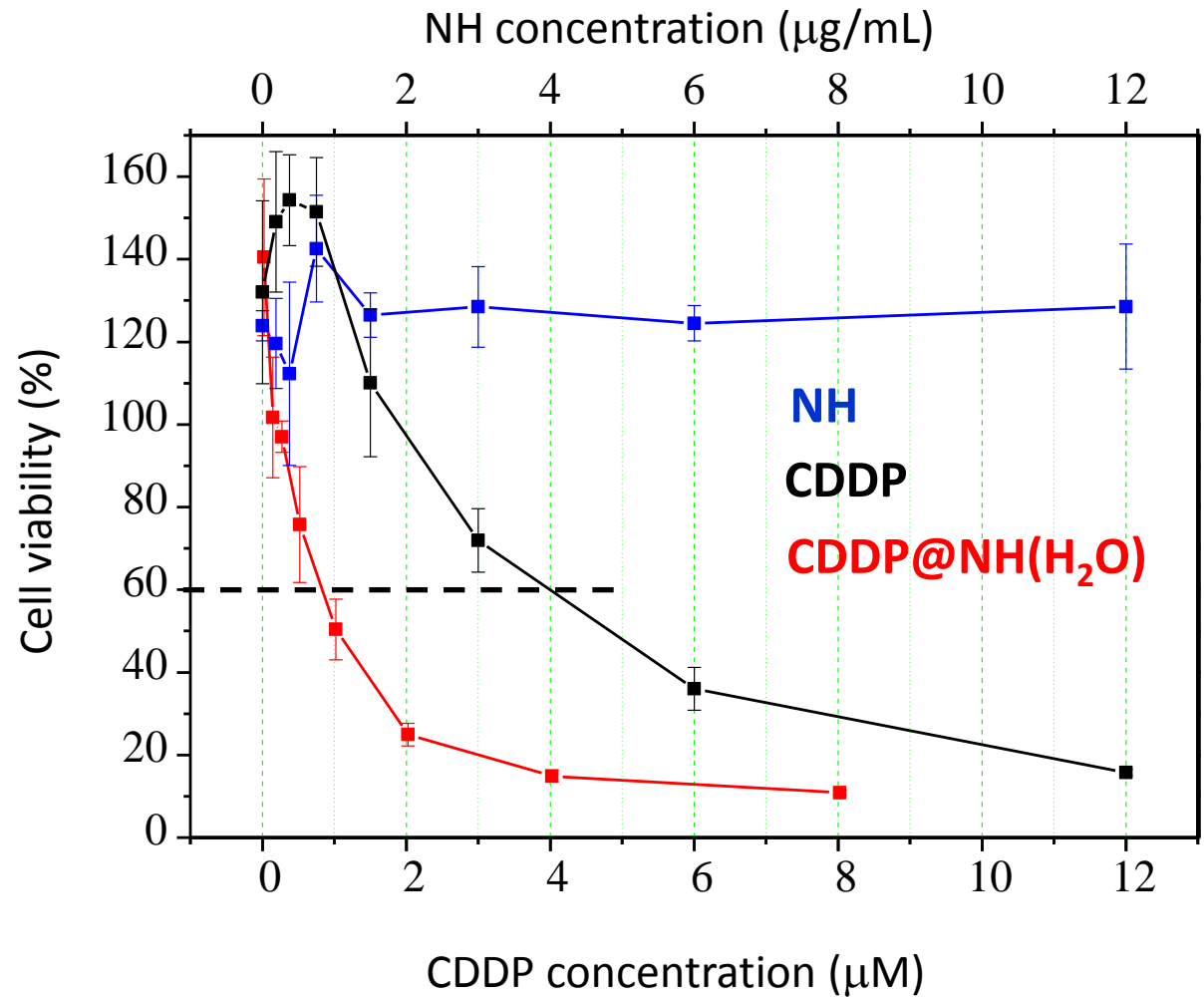
Incubation for 4 h



Exchange of medium to
CDDP-medium solution or
CDDP@NH(H₂O)-medium
suspension



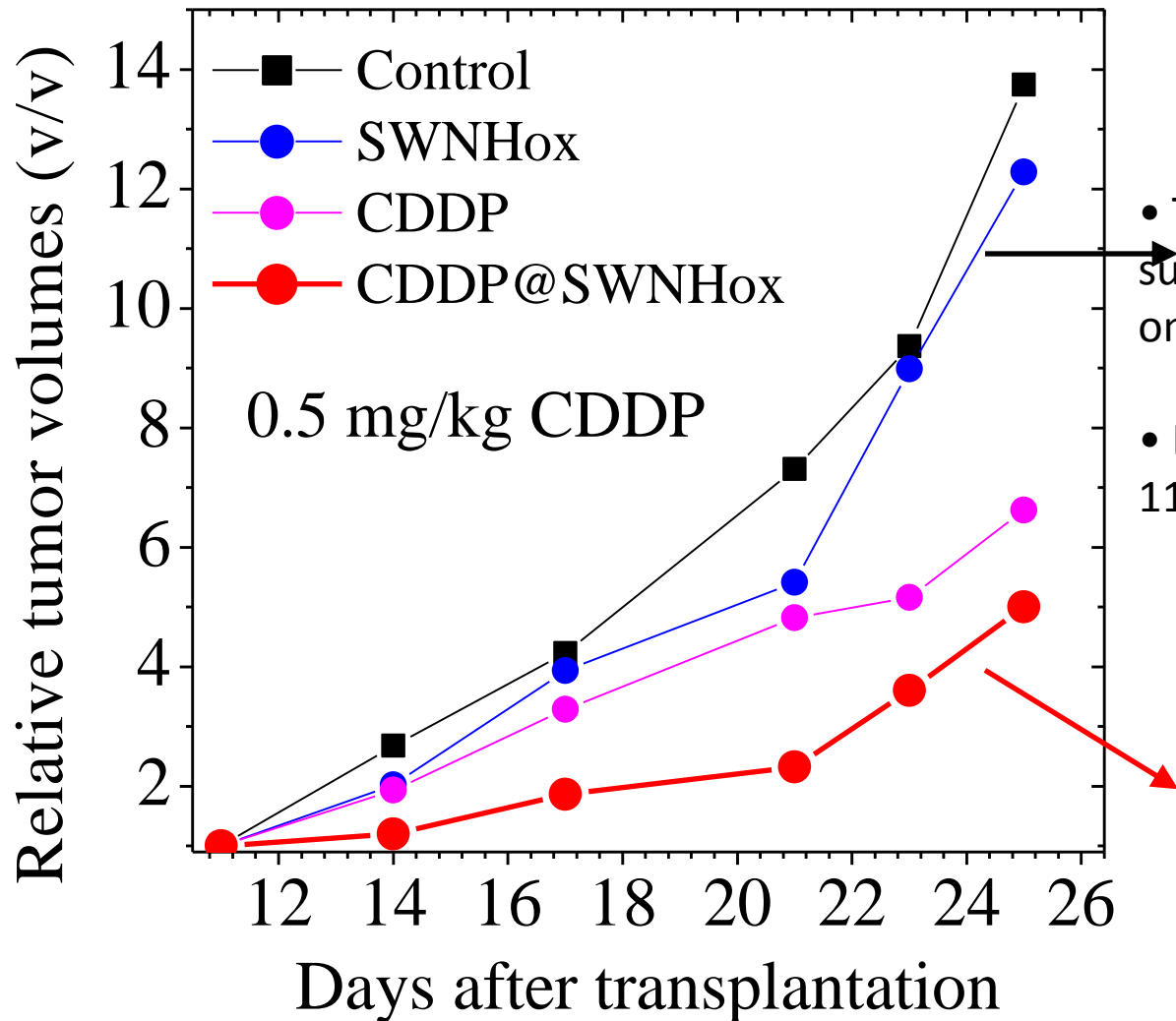
Incubation for 48 h



Ajima, Murakami et al, ACSNano 2008

Anticancer effect of CDDP@SWNHox

(In vivo, Nude mice)

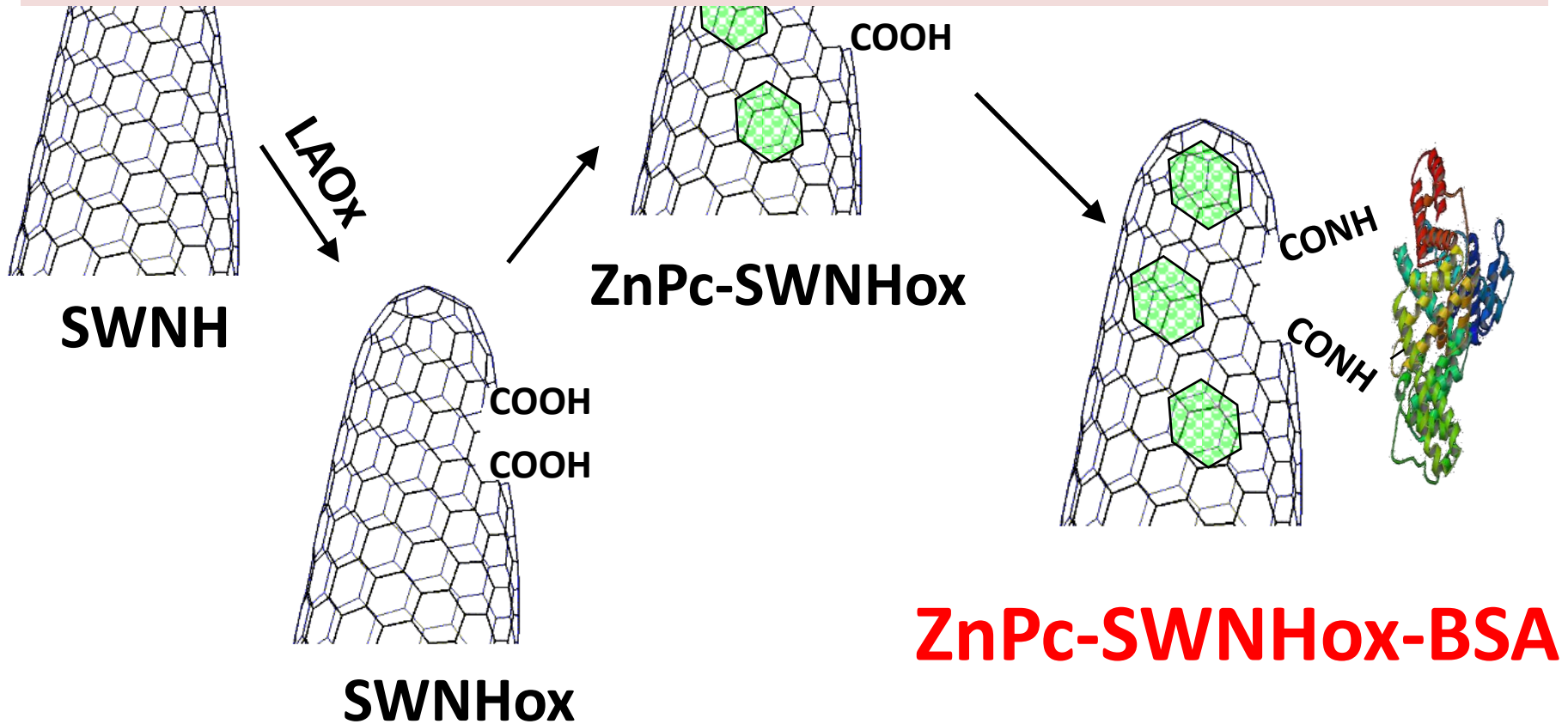


ZnPc-SWNHox-BSA For Double Photo-Therapy

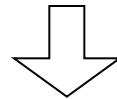
Zhang et al. PNAS 2008.

ZnPc: Photodynamic therapy (ROS)

SWNH: Photohyperthermia therapy (Light → Heat)



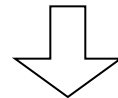
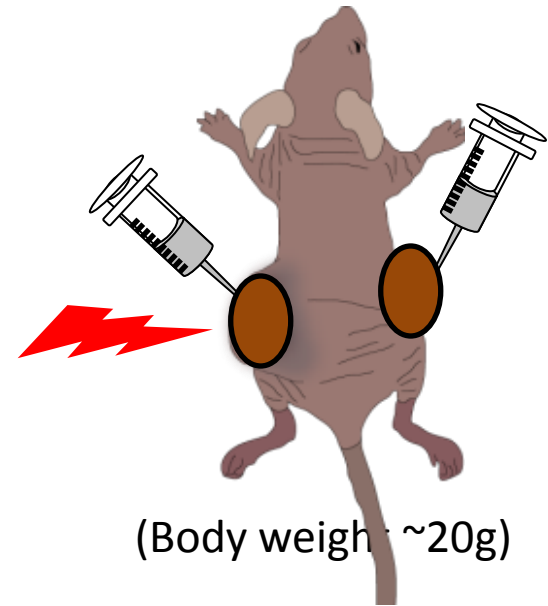
Subcutaneous transplantation of 5RP7 (Rat cancer cell) on nude mice



Intratumoral injection (Day 11, 200 μ L)

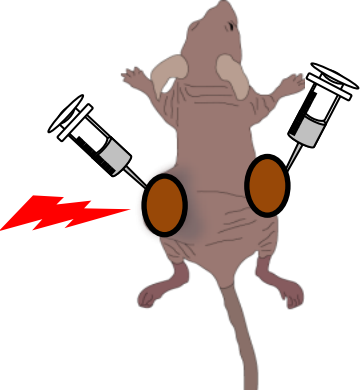
- PBS (Control)
- SWNHox-BSA
- ZnPc
- ZnPc-SWNHox-BSA

ZnPc 50 μ M: 5.5 μ g/shot = 0.28 mg/kg,
SWNHox 1 mg/mL: 16 μ g/shot = 0.8 mg/kg)



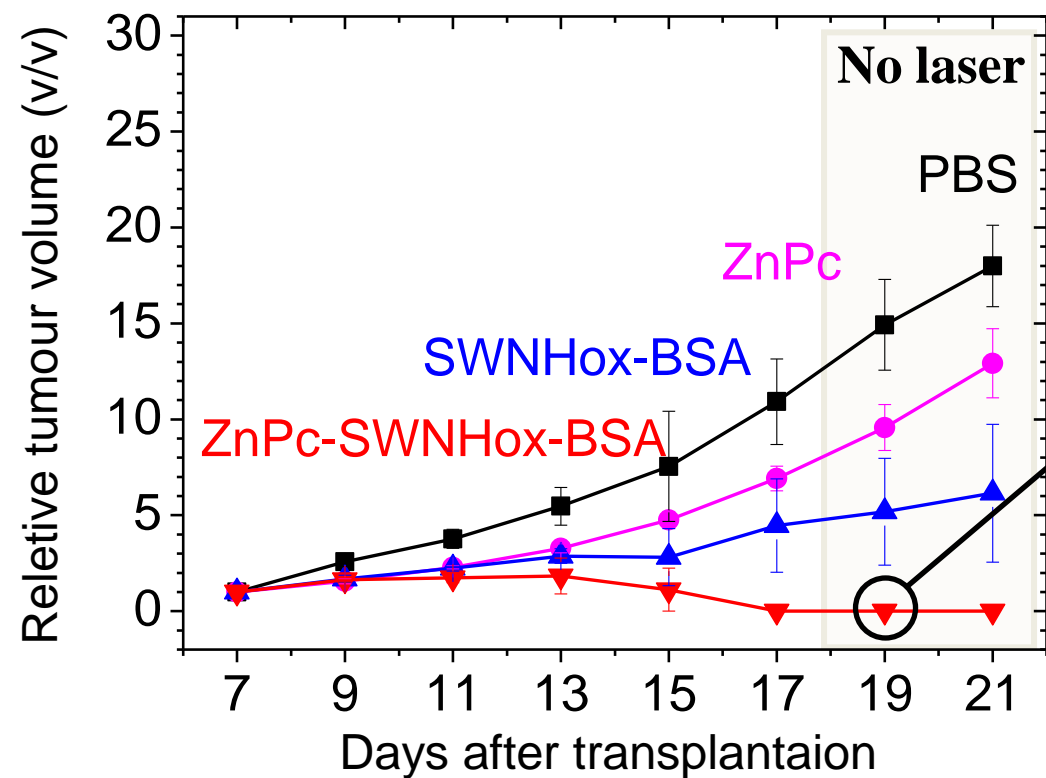
Left frank tumor: **Laser irradiation** 15minutes/day.

Right frank tumor: **No laser** irradiation.

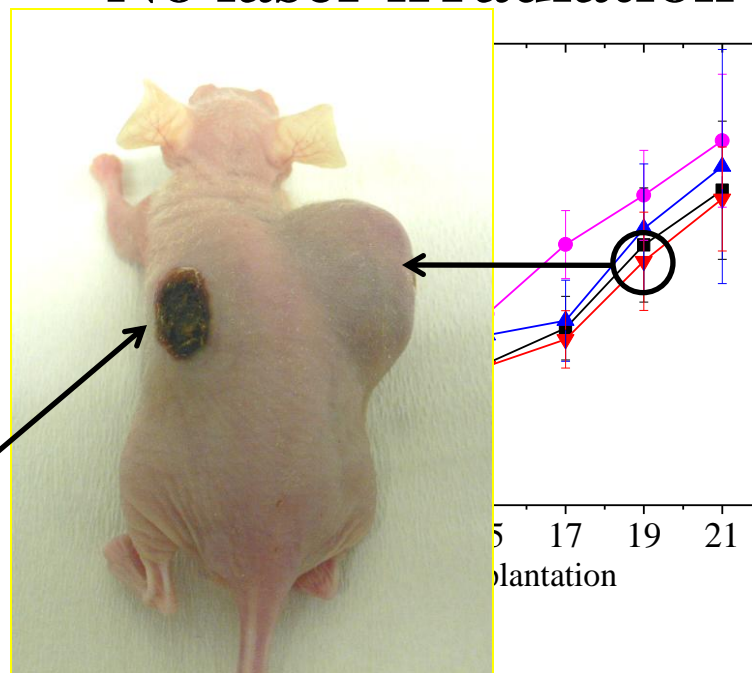


Tumors disappeared by double phototherapy with ZnPc-SWNHox-BSA

Laser irradiation



No laser irradiation

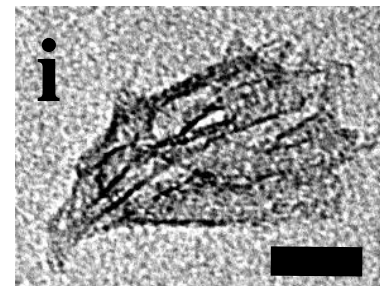
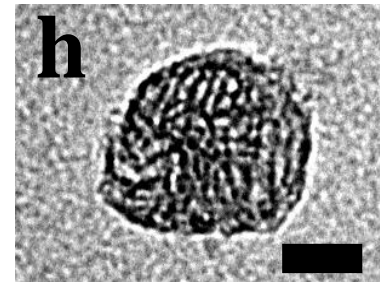
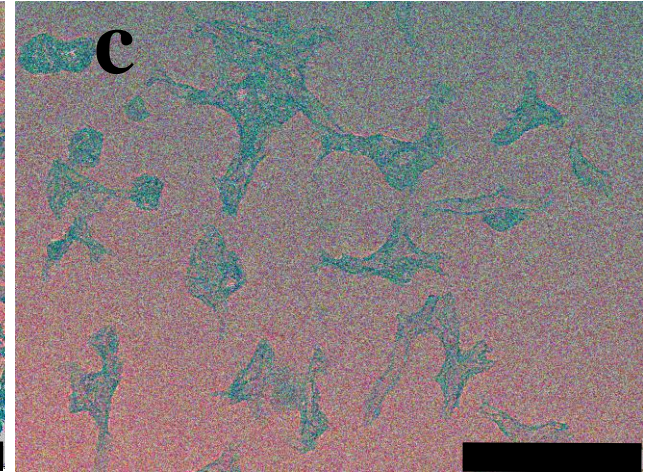
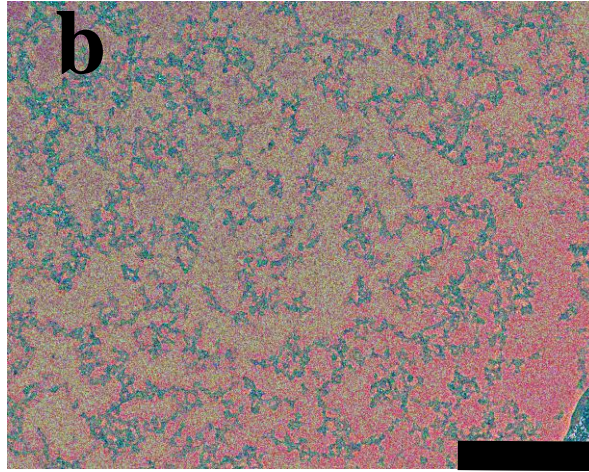


Zhang et al. PNAS 2008.

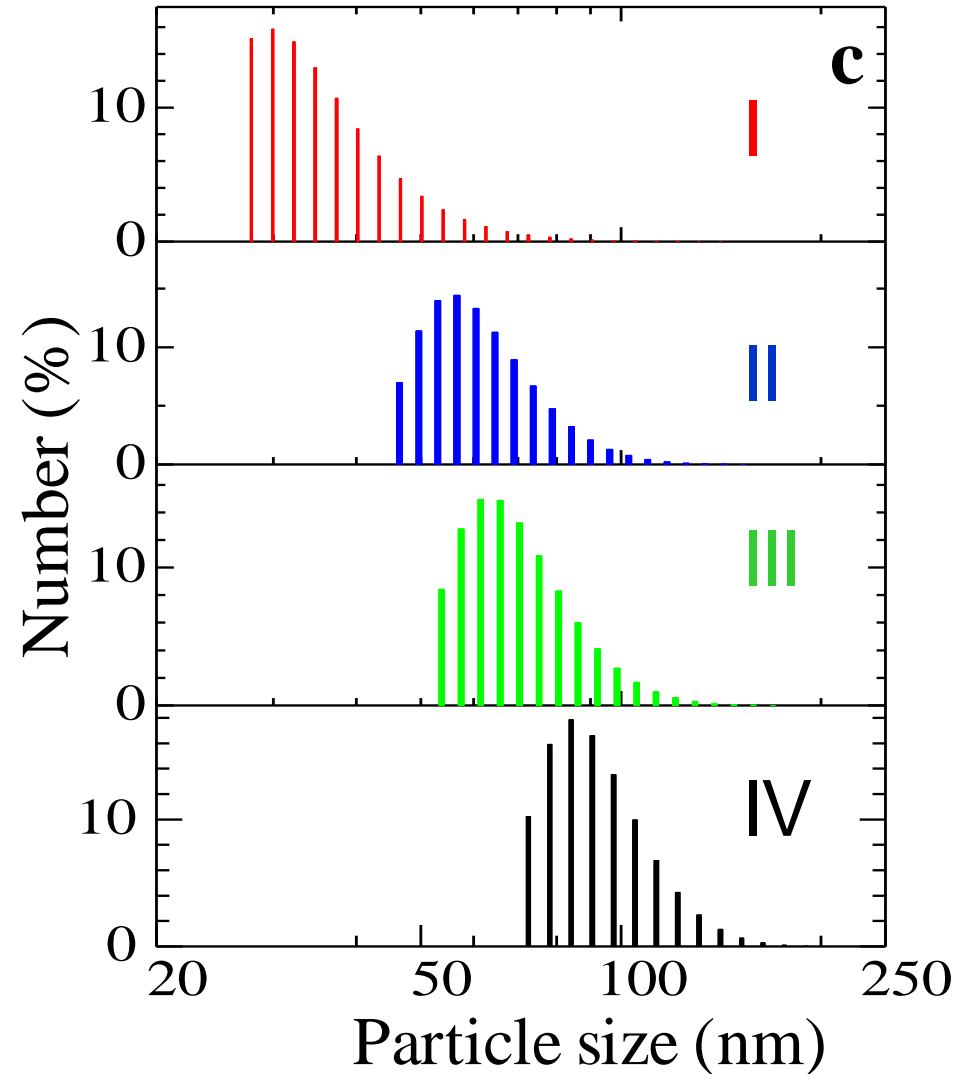
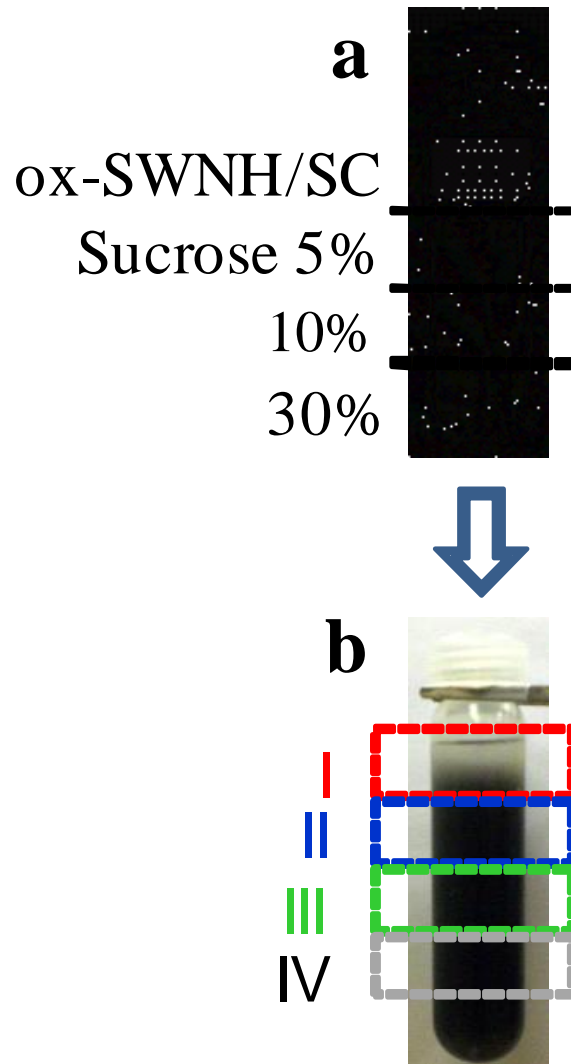
サイズ制御

TEM Images of Individual SWNHs

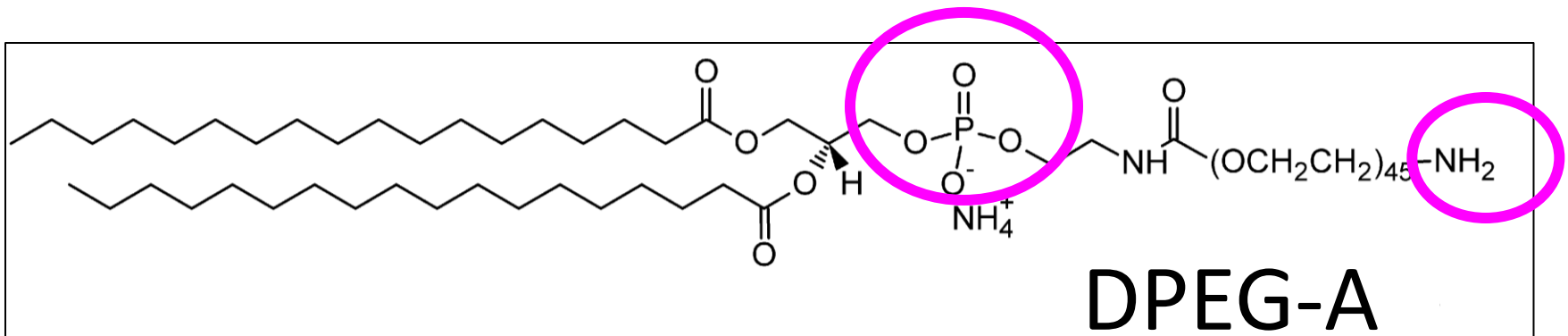
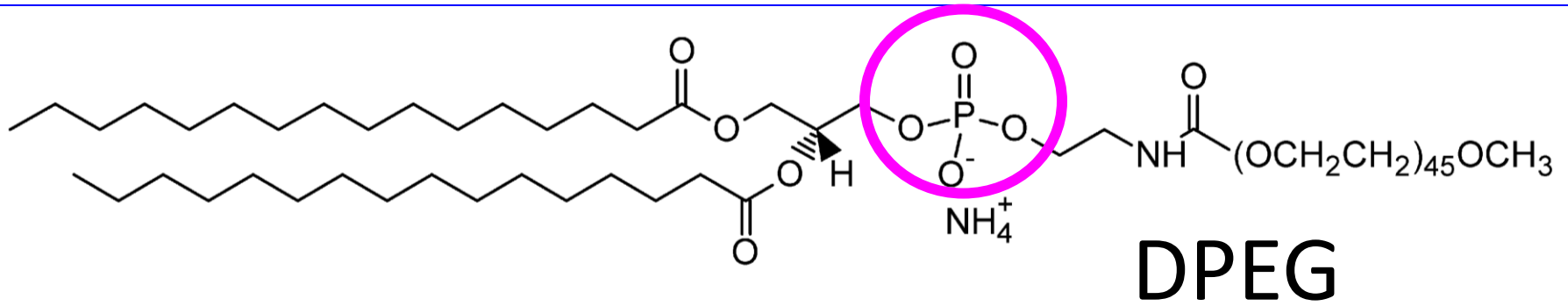
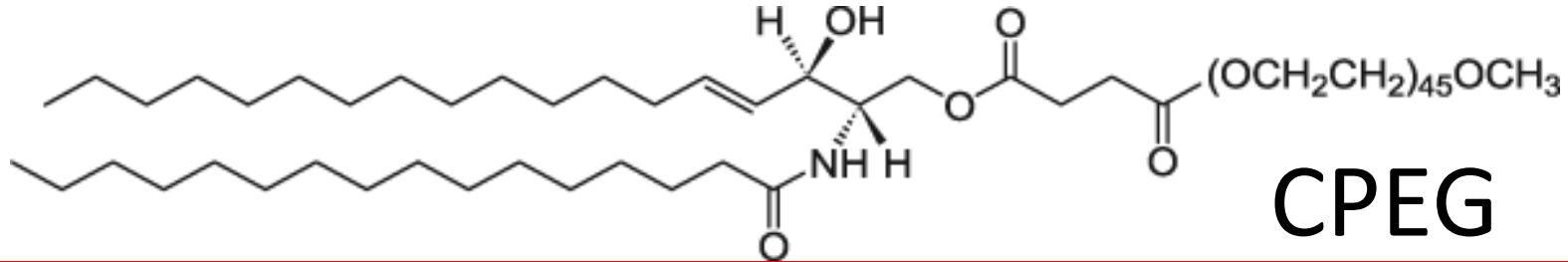
Scale bars:
100 nm (b)
50 nm (c)
10 nm (d-i).



Sucrose gradient centrifuges to obtain individual SWNHs and small-aggregates

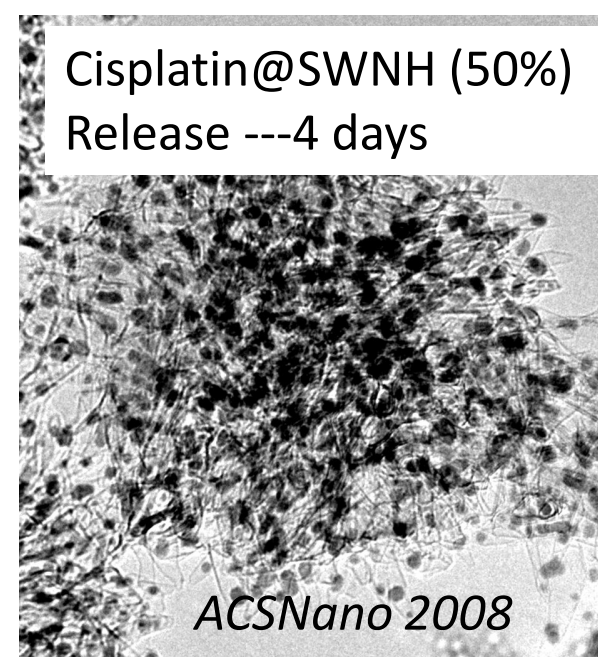


より適した分散剤の開発

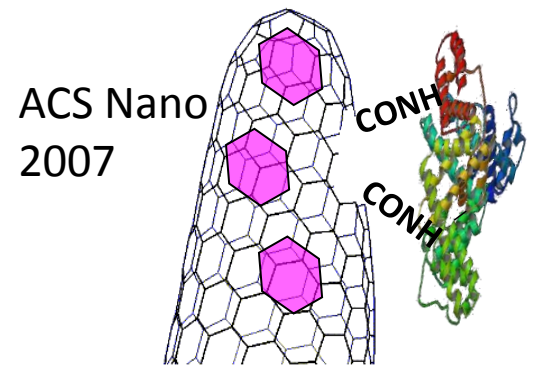


Advantages of SWNH for DDS application

1. Abundant drug storage and slow release
2. Long stay at tumor sites
3. Antitumor actions of SWNH itself
4. Multi-functionalization
5. Phototherapy
6. Multi-therapy
7. Acute toxicity: Not found



Double Phototherapy
PNAS 2008



ZnPc-SWNHox-BSA