

# Low Concentration of TiO<sub>2</sub> Nanoparticle Induced Cell Proliferation

○Qingqing Sun<sup>1,2</sup>, Koki Kanehira<sup>3</sup>, Akiyoshi Taniguchi<sup>1,2\*</sup>

<sup>1</sup> Department of Nanoscience and Nanoengineering, Waseda University, 3-4-1 Okubo, Shinjuku, Tokyo 169-8555, Japan.

<sup>2</sup> International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan.

<sup>3</sup> TOTO Ltd. Research Institute, Nakashima 2-1-1, Kokurakita, Kitakyushu, 802-8601, Japan.

\*E-mail address: TANIGUCHI.Akiyoshi@nims.go.jp

## 1. Introduction

Titanium Oxide nanoparticles (TiO<sub>2</sub> NPs) have been widely used in various fields because of their high surface area-to-volume ratio and specific properties. However it also causes nanotoxicity in biomaterials at high concentration of NPs [1]. To decrease its nanotoxicity, one common way is modification of TiO<sub>2</sub> NPs with PEG or PEG-derived polymers. In our work, TiO<sub>2</sub> (100 nm), P25-TiO<sub>2</sub> (200 nm) [2] and PEG-TiO<sub>2</sub> (100 nm) [3] NPs were separately fabricated as described previously. The objective of this study is to focus on the effects of different concentrations of TiO<sub>2</sub> NPs on Hepatocellular cell line (HepG2), including cell viability, cellular uptake, cell proliferation, and cell cycle.

## 2. Results

The SEM images of the three agglomerated NPs are shown in figure 1 (A)~(C). Figures (D) and (E) show cell viability of TiO<sub>2</sub> NPs in HepG2 cells. The results revealed low concentration ( $\leq 100$   $\mu\text{g/mL}$ ) of TiO<sub>2</sub> NPs increased cell viability, while high concentration (400~1000  $\mu\text{g/mL}$ ) of TiO<sub>2</sub> NPs caused cytotoxicity to HepG2 cells. Furthermore, cell numbers of HepG2 cells significantly increased under low concentrations of TiO<sub>2</sub> NPs compared with the control (Fig.1D&E). Now, we are studying on the cell cycle and how TiO<sub>2</sub> NPs induce proliferation of HepG2 cells.

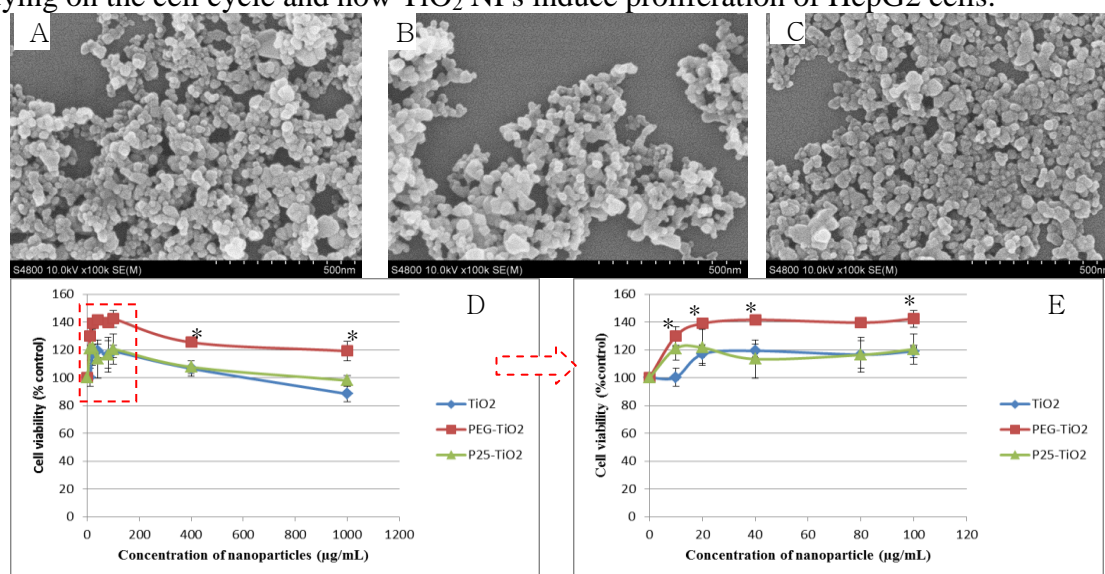


Figure 1. The SEM morphologies of different NPs and their effects on cell viability of HepG2 cells. A: TiO<sub>2</sub> NPs (100 nm), B: P25-TiO<sub>2</sub> NPs (200 nm), C: PEG-TiO<sub>2</sub> NPs (100 nm); D: Cell viability of HepG2 cells. HepG2 cells were exposed to the three NPs for 72 h; E: The amplification of cell viability under low concentration exposure; \* $p \leq 0.05$ ,  $n \geq 3$ .

## Reference:

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