Structure establishment of three-dimensional (3D) cell culture printing model for bladder cancer

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**Purpose**

- Two-dimensional (2D) cell culture
  - Sometimes, Unpredictable, misleading data about in vivo response
  - Three-dimensional (3D) *in vitro* tumor model resembles situation *in vivo*
  - So, to confirm, 3D cell culture is better than 2D cell culture to explain the tumor formation response to chemotherapy

**Material & Methods**

1) 3D cell culture were used for the bladder cancer cell line 5637 by 3D bio printer, 2D cell culture were used for T24 cells.

2) To examine their cancer inhibition effects, Rapamycin and Bacillus Calmette-Gue´rin (BCG) were used.

3) Measuring e-cadherin and n-cadherin secreted via the epithelial-mesenchymal transition (EMT) to identify the cell-cell interaction.
Result

|                | 2D Un | 3D Un | 2D BCG | 3D BCG | 2D Un | 3D Un | 2D BCG | 3D BCG |
|----------------|-------|-------|--------|--------|-------|-------|--------|--------|
| Cytokine level |        |       |        |        |       |       |        |        |
| IL-6           | 20.4  | 2.3   | 23.8   | 2.7    | 22.0  | 0.6   | 18.5   | 0.7    |
| IL-12          | 29.7  | 0.9   | 29.2   | 0.9    | 29.3  | 0.7   | 29.6   | 0.9    |
| INF-γ          | 31.3  | 1.0   | 33.2   | 1.0    | 34.4  | 1.0   | 34.2   | 1.0    |

↑ The BCG effect on cytokine production in the 2D and 3D cell culture environment

Conclusion

- 3D bladder cancer cell culture is more similar to bladder cancer tissue than 2D cell culture
- 3D cell culture will be used to cancer cell-like environment for a drug screening platform