

### Catechol-grafted Dextran as Anti-fouling Material for Metal implants

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Surface modification of biomedical materials to prevent protein adsorption is one of the main issues in the study of prosthetics. There have been various attempts to generate antifouling properties on the surface of implantable materials ; however, insufficient stability and degradation in the aqueous environment made it difficult to maintain the desired effects. Here, we propose catechol-grafted dextran as a promising coating material for metallic implant materials. Catechol is conjugated to dextran at various grafting densities of catechol to dextran. Titanium dioxide is coated with catechol-grafted dextran via strong adhesive capability of catechol. The surface-modified titanium dioxide is subsequently tested to examine the anti-fouling effect against serum albumin and showed excellent resistance to non-specific protein adsorption. It is expected that catechol-grafted dextran has high potential as a surface coating material for a wide range of implant materials.

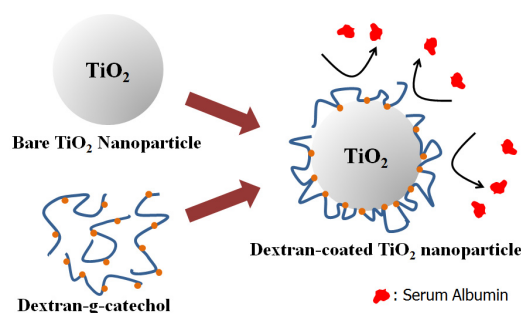


그림 1. 덱스트란-카테콜을 이용해 이산화티타늄 나노파티클의 표면을 코팅한 모습과 anti-fouling 효과를 나타낸 모식도

색인 단어: anti-fouling; dextran; catechol; protein adsorption; titanium dioxide

#### 참고문헌

1. Jackson DR, Omanovic S, Roscoe SG, Electrochemical studies of the adsorption behavior of serum proteins on titanium. *Langmuir* 16, 12 (2000) 5449-5457.
2. Lee H, Lee KD, Pyo KB, Park SY, Lee H, Catechol-Grafted Poly(ethylene glycol) for PEGylation on Versatile Substrates. *Langmuir* 26, 6 (2010) 3790-3793.
3. Martwiset S, Koh AE, Chen W, Nonfouling characteristics of dextran-containing surfaces. *Langmuir* 22, 19 (2006) 8192-8196.