

平成25年度

# ライフサイエンスイノベーション推進機構セミナー

日時：平成25年11月15日(金)13:00~14:00

会場：工学部総合研究棟Ⅲ122M(文京キャンパス)

演者：長富 次郎 准教授

アメリカクレムソン大学

バイオエンジニアリング学科

演題：Hydrogel-Based Biomaterials  
for Repair and Regeneration  
of the Urinary Bladder



Approximately 400 million people suffer from bladder diseases world-wide and many of them require partial or total organ reconstruction. Despite the recent clinical success in bladder tissue engineering as a new alternative for tissue reconstruction, there remain several unresolved issues. For example, use of PLGA, a rigid polymer, for scaffold does not permit proper distension and prolonged in vitro cultures of smooth muscle cells often result in loss of contractile phenotype of these cells. Thus, development of both a biomaterial that matches the native tissue mechanical properties and an approach to guide the growth of functional smooth muscle is necessary. Biological hydrogels derived from the extra-cellular matrix (ECM) such as collagen, offer desirable properties for tissue engineering including cell adhesion sites, but its low mechanical strength is not suitable for bladder tissue regeneration. In contrast, synthetic hydrogels such as PEG allow tuning of mechanical properties, but do not elicit protein adsorption or cell adhesion. For this reason, we are currently exploring the use of stiffer hydrogel blends composed of amphiphilic PEO-PPO block co-polymer, Tetronic (BASF) 1107-acrylate (T1107-A) in combination with ECM moieties, collagen and hyaluronic acid (HA) in this application. Specifically, the present study examined bladder smooth muscle cell response to this hydrogel system, as well as the time-course variation in mechanical properties of the cellular hydrogels constructs. Moreover, we are currently exploring similar Tetronic hydrogel formulations in applications toward compliant soft tissue adhesive for repair and reconstruction of urinary tissues.



主催：福井大学ライフサイエンスイノベーション推進機構  
生命科学複合研究教育センター

担当教員：工学研究科繊維先端工学専攻  
工学研究科生物応用化学専攻

担当者：総合戦略部門研究推進課研究施設(文京)

末 信一郎 (内線4627)

里村 武範 (内線4620)

田口、中川 (内線2059)