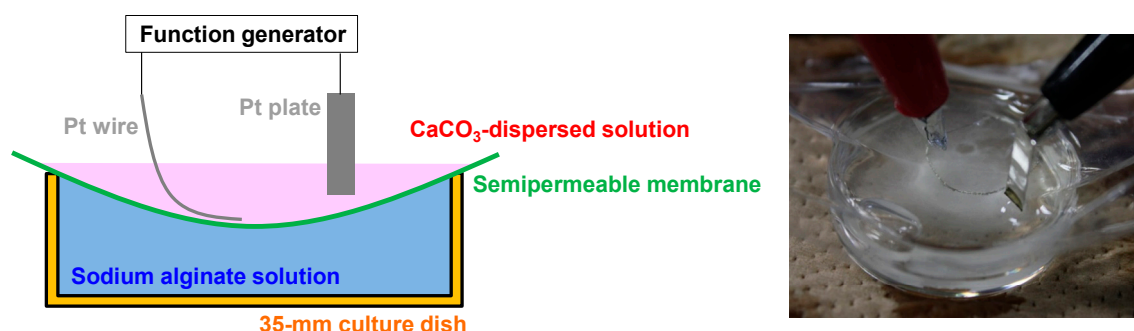
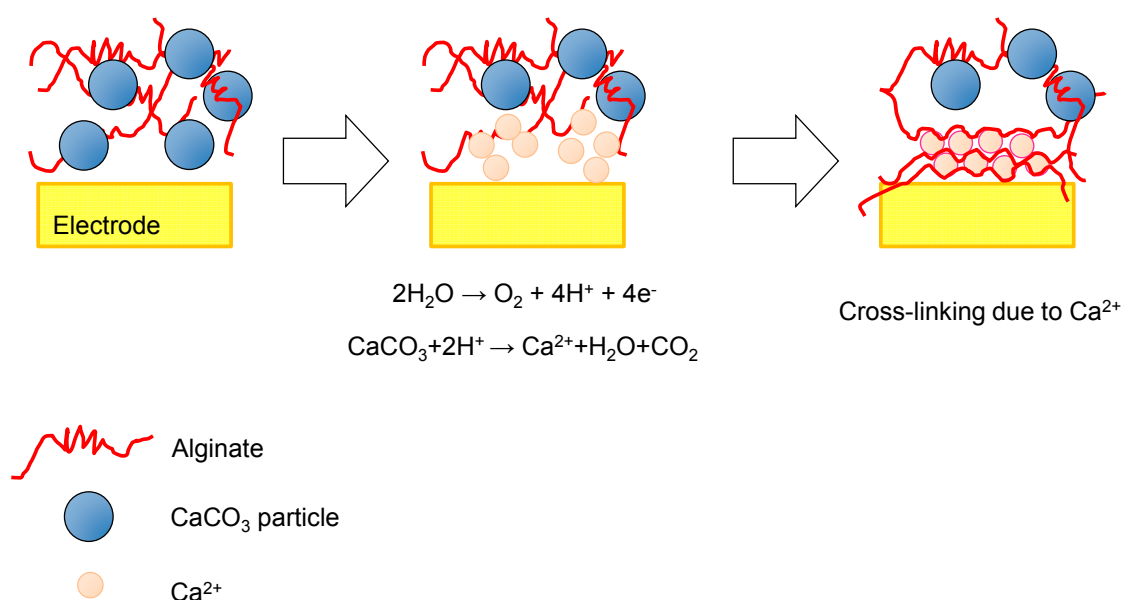


# Supplementary Materials: Electrochemical Hydrogel Lithography of Calcium-Alginate Hydrogels for Cell Culture

Fumisato Ozawa, Kosuke Ino, Hitoshi Shiku and Tomokazu Matsue



**Figure S1.** Schematic illustration and picture for electrochemical lithography. The electrode was manually positioned and scanned. For the precise control, an xyz-stage is necessary.



**Figure S2.** Procedure for the direct electrodeposition of calcium-alginate hydrogels.  $\text{Ca}^{2+}$  is produced from the reaction between  $\text{CaCO}_3$  and electrolytically-generated  $\text{H}^+$  from water. The generated  $\text{Ca}^{2+}$  reacts with alginate directly, forming a hydrogel on the electrode. This method has been previously reported [1–6].

## References

1. Wang, Y.; Liu, Y.; Cheng, Y.; Kim, E.; Rubloff, G.W.; Bentley, W.E.; Payne, G.F. Coupling electrodeposition with layer-by-layer assembly to address proteins within microfluidic channels. *Adv. Mater.* **2011**, *23*, 5817–5821.
2. Cheng, Y.; Luo, X.; Tsao, C.Y.; Wu, H.C.; Betz, J.; Payne, G.F.; Bentley, W.E.; Rubloff, G.W. Biocompatible multi-address 3D cell assembly in microfluidic devices using spatially programmable gel formation. *Lab Chip* **2011**, *11*, 2316–2318.
3. Shi, X.W.; Tsao, C.Y.; Yang, X.H.; Liu, Y.; Dykstra, P.; Rubloff, G.W.; Ghodssi, R.; Bentley, W.E.; Payne, G.F. Electroaddressing of cell populations by co-deposition with calcium alginate hydrogels. *Adv. Funct. Mater.* **2009**, *19*, 2074–2080.

4. Cheng, Y.; Luo, X.L.; Betz, J.; Payne, G.F.; Bentley, W.E.; Rubloff, G.W. Mechanism of anodic electrodeposition of calcium alginate. *Soft Matter* **2011**, *7*, 5677–5684.
5. Ozawa, F.; Ino, K.; Takahashi, Y.; Shiku, H.; Matsue, T. Electrodeposition of alginate gels for construction of vascular-like structures. *J. Biosci. Bioeng.* **2013**, *115*, 459–461.
6. Ozawa, F.; Ino, K.; Arai, T.; Ramón-Azcón, J.; Takahashi, Y.; Shiku, H.; Matsue, T. Alginate gel microwell arrays using electrodeposition for three-dimensional cell culture. *Lab Chip* **2013**, *13*, 3128–3135.