

## MIXING CELLS WITH CELLINK FIBRIN

*This is a suggested procedure, please adjust according to your experimental needs.*

### Aim of the protocol:

To demonstrate how to mix cells with **CELLINK FIBRIN** bioink.

### Materials needed:

- Primary human keratinocytes, HEK
- Primary human fibroblasts, HDF
- **CELLINK FIBRIN** bioink
- Syringes with luer lock connections
- [CELLMIXER](#)
- [Female/Female luer lock adaptor](#)
- [Empty Cartridges with End and Tip cap, 3cc](#)
- Pipette
- Pipette tips
- Culture medium

### Protocol:

Step n°	Title	Material	Description
1	Prepare cell suspension	<ul style="list-style-type: none"> <li>▪ Cells</li> <li>▪ Culture medium</li> </ul>	<ul style="list-style-type: none"> <li>❖ Resuspend cells in cell culture medium</li> </ul> <p>NOTE! Cells should be mixed with <b>CELLINK FIBRIN</b> at a 1:10 ratio to reach the final cell concentration of <math>5 \times 10^6</math> cells/ml, <math>10 \times 10^6</math> cells/ml or <math>20 \times 10^6</math> cells/ml depending on part of construct.</p>
2	Mix the <b>CELLINK FIBRIN</b> bioink with the cells	<ul style="list-style-type: none"> <li>▪ <b>CELLINK FIBRIN</b> bioink</li> <li>▪ Cell suspensions</li> <li>▪ <a href="#">CELLMIXER</a></li> </ul>	<ul style="list-style-type: none"> <li>❖ Add cell suspension to a syringe with a pipette (see video)</li> <li>❖ Add <b>CELLINK FIBRIN</b> to another syringe using a <a href="#">Female/Female luer lock adaptor</a></li> <li>❖ The cell suspension is carefully mixed with the CELLMIXER:</li> </ul> <p>Please watch the video in this link for a detailed illustration on how to do the mixing process:</p>


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			<a href="https://www.youtube.com/watch?v=CmSYL1-oltl">https://www.youtube.com/watch?v=CmSYL1-oltl</a>
3	Transfer mixed cells and ink to cartridges	<ul style="list-style-type: none"> <li>▪ <a href="#">Empty Cartridges with End and Tip cap, 3cc</a></li> <li>▪ <a href="#">Female/Female luer lock adaptor</a></li> <li>▪ <a href="#">Conical tips, 410µm ID (22 GA)</a></li> </ul>	<ul style="list-style-type: none"> <li>❖ Transfer the mixed cells and <b>CELLINK FIBRIN</b> bioink with the female/female luer lock adaptor to an <a href="#">Empty Cartridge with End and Tip cap, 3cc</a></li> <li>❖ Put a <a href="#">Conical tip, 410µm ID (22 GA)</a> on the cartridge and mount in the printer.</li> <li>❖ Repeat for all three cartridges.</li> </ul>

 Want to see our talented Biologist proceed to this protocol? Feel free to find the video here:  
<https://www.youtube.com/...>

### Applications:

- ➔ Link to Videos of some applications
- ➔ photos of some applications

 Want to see our existing tissue model?  
Just go to <http://bioverse.co/> and discover a whole library of CAD files especially created for sharing 3D Bioprinting models.

### References:

Markstedt K *et al.* 3D Bioprinting Human Chondrocytes with Nanocellulose-Alginate Bioink for Cartilage Tissue Engineering Applications. *Biomacromolecules*. 2015;16;1489-96  
Martínez H *et al.* 3D Bioprinting of Human Chondrocyte-laden Nanocellulose Hydrogels for Patient-specific Auricular Cartilage Regeneration. *Bioprinting*. 2016;1;22-35

- This protocol is optimized based on CELLINK™ Bioink, and may need further optimization for other bioinks. For more information, please contact: [bioinkteam@cellink.com](mailto:bioinkteam@cellink.com)

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