

1. Objective

Coating of channels of OrganoPlate® tissue culture chips to improve cell attachment, tubule formation, or biological performance of the culture.

2. Background

The materials that make up the OrganoPlate® tissue culture chips are compatible with cell culture. However, certain cell types benefit from or require the use of a coating with extracellular matrix proteins, as they also do in other culture vessels (e.g. flasks and dishes). This protocol describes the procedure for channel coating. Channel coating is performed after ECM gel seeding and incubation, but before cell seeding.

3. Materials

- An OrganoPlate® (2-lane, 3-lane, or Graft) with ECM gel already seeded in the ECM gel channel
- (Repeating) pipettes (e.g. for dispensation of 40 µL volumes)
- Coating materials
 - Depending on your coating of choice

4. Procedures

1. Follow the steps described in [our protocols for ECM gel seeding](#)
 - a. Loading of ECM gel (e.g. collagen-I or Matrigel) into the ECM gel channel
 - b. Incubation of the gel for the recommended duration
2. During incubation of the ECM gel, prepare a coating solution
 - a. Commonly used coatings in cell culture can be applied to coat OrganoPlate® channels
 - b. Examples of coatings can be found in table 1

Table 1: coatings that can be used for channel coating in OrganoPlate®

Matrigel coating	1:100 dilution of Matrigel (Corning, 356237) in cold PBS or cold medium
Matrigel-GFR coating	1:100 – 1:25 dilution of Matrigel-GFR (Corning, 256231) in cold PBS or cold medium
Collagen-IV coating	50 µg/mL collagen-IV in PBS or medium
Fibronectin coating	30 µg/mL fibronectin in PBS or water
Gelatin coating	1% gelatin in PBS

3. After ECM gel polymerization (step 1), add the coating solution (step 2) to the inlet well of the channel(s) you want to coat, e.g. by adding 40 µL to the corresponding inlet well of the perfusion channel(s)

4. Incubate the coating according to common practice in literature
 - a. Incubate plate at 37°C in a humidified incubator or at RT, depending on coating of choice
 - b. Incubate as short as 15 min or as long as 48h, depending on the coating of choice
5. Optional: if the coating of choice generally requires a washing step when used in other tissue culture vessels, this washing step is also recommended in OrganoPlate®
 - a. Washing is achieved by aspirating the coating solution and adding washing reagent (e.g. 50 µL water or PBS) to inlet and outlet wells. Repeat if necessary.
6. Proceed with cell seeding.
 - a. Cell seeding in coated channels can be achieved following the procedures in our [protocol for wet channel seeding via passive pumping technique](#).

5. Troubleshooting

The polymerization of certain ECM gels, e.g. collagen-I, is pH dependent. For this reason, use of acidic coating solutions may impair the integrity of the ECM gel in the gel channel. We recommend the use of pH neutral coatings.

MIMETAS product list

Cat. No.	Product Name
MI-AR-CC-01	OrganoReady® Caco-2
9605-400-B	OrganoPlate® 2-lane
4004-400-B	OrganoPlate® 3-lane 40
6405-400-B	OrganoPlate® 3-lane 64
6401-400-B	OrganoPlate® Graft
MI-OFPR-S	OrganoFlow® S
MI-OFPR-L	OrganoFlow® L
MI-OT-1	OrganoTEER®

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