

The ibidi product family is comprised of a variety of μ-Slides and μ-Dishes, which have all been designed for high-end microscopic analysis of fixed or living cells. The high optical quality of the material is similar to that of glass, so you can perform all kinds of fluorescence experiments with uncompromised resolution and choice of wavelength.

The μ-Slide Angiogenesis is a cell culture product for tube formation, angiogenesis assays and direct cell culture. Cells can be grown on or in gel matrices, e.g. Matrigel™ or directly on the ibidi Polymer Coverslip.

## Material

ibidi μ-Slides, μ-Dishes, and μ-Plates are made of a plastic that has the highest optical quality. The polymer coverslip on the bottom exhibits extremely low birefringence and autofluorescence, similar to that of glass. Also, it is not possible to detach the bottom from the upper part. The μ-Slides, μ-Dishes, and μ-Plates are not autoclavable, since they are only temperature-stable up to 80°C/175°F. Please note that gas exchange between the medium and incubator's atmosphere occurs partially through the polymer coverslip, which should not be covered.

### Optical Properties ibidi Polymer Coverslip

|                                 |                   |
|---------------------------------|-------------------|
| Refractive index $n_D$ (589 nm) | 1.52              |
| Abbe number                     | 56                |
| Thickness                       | No. 1.5 (180 μm)  |
| Material                        | Polymer coverslip |

**Please note! The ibidi Polymer Coverslip is compatible with certain types of immersion oil only. A list of suitable oils can be found on page 4.**

## Shipping and Storage

The μ-Slides, μ-Dishes and μ-Plates are sterilized and welded in a gas-permeable packaging. The shelf life under proper storage conditions (in a dry place, no direct sunlight) is listed in the following table.

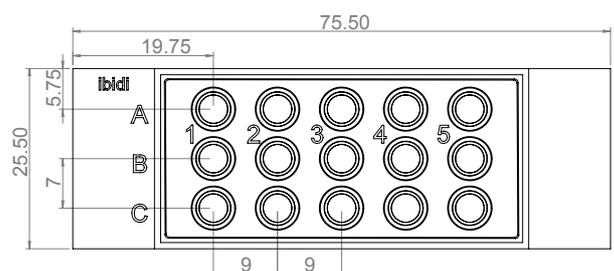
| Conditions          |              |
|---------------------|--------------|
| Shipping conditions | Ambient      |
| Storage conditions  | RT (15–25°C) |
| Shelf Life          |              |
| ibiTreat, Uncoated  | 36 months    |

## Geometry

The μ-Slide Angiogenesis provides standard slide format according to ISO 8037/1. The well-to-well distance of 9 mm (like 96 well plates) allows using multichannel pipettes.

### Geometry of the μ-Slide Angiogenesis

|                          |                             |
|--------------------------|-----------------------------|
| Outer dimensions (w x l) | 25.5 x 75.5 mm <sup>2</sup> |
| Number of wells          | 15                          |
| Volume inner well        | 10 μl                       |
| Diameter inner well      | 4 mm                        |
| Depth inner well         | 0.8 mm                      |
| Volume upper well        | 50 μl                       |
| Diameter upper well      | 5 mm                        |
| Height with/without lid  | 5.3/3.7 mm                  |
| Growth area inner well   | 0.125 cm <sup>2</sup>       |
| Coating area using 10 μl | 0.23 cm <sup>2</sup>        |
| Bottom matches coverslip | No. 1.5                     |



## Surface

The tissue culture-treated ibiTreat surface is a physical surface modification and optimized for adhesion of most cell types. The uncoated surface is a very hydrophobic surface and allows no direct cell growth. It is suitable for specific coatings or suspension cells.

If you like to establish a particular coating for your demands we recommend testing your coating procedure on uncoated and ibiTreat surfaces, since some proteins and

biomolecules adhere differently to hydrophobic or hydrophilic polymer surfaces.

### Coating your μ-Slide Angiogenesis

In tube formation assays the μ-Slide Angiogenesis is coated with a 0.8 mm thick layer of gel matrix.

1. Prepare your gel matrix according to the manufacturer's protocol or reference.
2. Fill the inner well with 10 μl liquid gel. Avoid air bubbles.
3. Let the gel polymerize under appropriate conditions.
4. Use as soon as possible.
5. If storage is needed fill sterile water around the wells to generate a humidified environment to hinder evaporation.

Non-gel based coatings are also possible. Please use 10 μl coating solution and calculate with an area to be coated of 0.23 cm<sup>2</sup> per well. Further information about coatings is provided in [Application Note 08 "Cell culture coating"](#).

Further information about the optimization of experimental parameters and data analysis is provided in [Application Note 27 "Tube Formation – Data Analysis"](#).

#### Tip:

Air bubbles in the gel can be reduced by equilibrating the μ-Slide Angiogenesis before usage inside the incubator overnight.

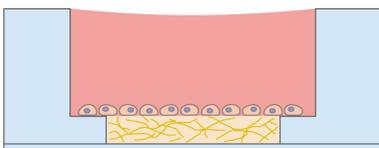
In case bent gel surfaces are created, increase or decrease the amount of gel used, until you get flat and even gels.

#### Tip:

For less evaporation the space in-between the wells can be filled with sterile water or agarose. Add agarose to water or buffer solution (e.g. 0.1 g to 10 ml water). Melt agarose solution using a microwave or boiling water bath and allow the solution to cool to ~50°C.

### Tube Formation Assays

In a tube formation assay cells are seeded on top of the polymerized gel matrix:

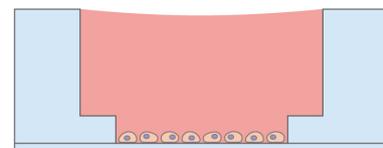


1. Trypsinize and count cells as usual. Dilute the cell suspension to the desired concentration. Depending on your cell type, we recommend 1–3 × 10<sup>5</sup> cells/ml.
2. Apply 50 μl of the cell suspension into the upper well. Do not touch the gel matrix with the pipet tip.
3. Cover the μ-Slide Angiogenesis with the supplied lid. Incubate at 37°C and 5 % CO<sub>2</sub> as usual.
4. Conduct your experiment.
5. Depending on the cell type, medium exchange is necessary every 1–2 days. Carefully aspirate the old medium and replace it by 50 μl fresh medium.

For a detailed protocol please refer to [Application Note 19 "Tube Formation"](#) and [Application Note 5 "Tube Formation in μ-Plate Angiogenesis 96 Well"](#).

### Seeding Cells in 2D

You can also use the μ-Slide Angiogenesis for a standard 2D cell culture without gel matrix.



1. Trypsinize and count cells as usual. Dilute the cell suspension to the desired concentration. Depending on your cell type, application of a 1.8–4.3 × 10<sup>5</sup> cells/ml suspension should result in a confluent layer within 2–3 days.
2. Apply 10 μl cell suspension into each well of the μ-Slide Angiogenesis. Avoid shaking as this will result in inhomogeneous distribution of the cells.
3. Cover the slide with the supplied lid. Incubate at 37°C and 5 % CO<sub>2</sub> as usual.
4. After cell attachment, add 50 μl cell-free medium to fill the upper well.

**Attention!**

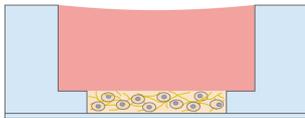
Avoid evaporation during seeding and cell culture in the incubator! We recommend placing the μ-Slide Angiogenesis in an extra humidity chamber (e.g. a Petri Dish with wetted paper).

Undemanding cells can be left in their seeding medium for up to three days and grow to confluence there. However, best results might be achieved when the medium is changed every 1–2 days. Carefully aspirate the old medium and replace it by 60 μl fresh medium per well.

**Experimental Setups**

Alternatively, the μ-Slide Angiogenesis can be used for the following assays:

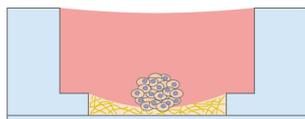
- Fill the inner well with cells suspended inside a gel matrix. After gel polymerization, add 50 μl cell-free medium to fill the upper well.



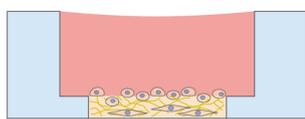
- Sandwich Cell Culture: Fill the inner well with a gel matrix. Seed cells on top of the polymerized gel and imbed the cells with 50 μl gel in the upper well.



- Fill the inner well with a low volume of the gel matrix, e.g. 8 μl. Seed cells, spheroids or tissue pieces on top of the polymerized gel. If necessary gently shake the slide to make the cells slide into the center of the well.



- Fill the inner well with fibroblasts suspended inside a gel matrix. Seed cells on top of the polymerized gel. Overlay the cell layer with medium and incubate for invasion of the cells into the gel matrix.



**Microscopy**

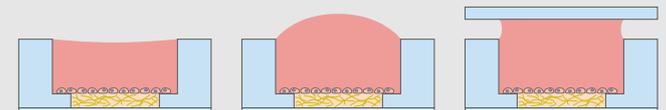
To analyze your cells, no special preparations are necessary. Cells can be directly observed live or fixed, preferably on an inverted microscope. The bottom cannot be removed. For optimal results in fluorescence microscopy and storage of fixed and stained samples, ibidi provides a mounting medium (50001) optimized for μ-Dishes, μ-Slides, and μ-Plates.

**Note:**

When gel matrices are used the optical quality and the use of high magnification objective lenses might be restricted.

**Tip:**

For phase contrast imaging after the experiment, the upper well can be overfilled with additional 25 μl. Closing the lid eliminates the meniscus of the upper well. This will create perfect phase contrast images. Please keep in mind that this overfilling technique might lead to well-to-well crosstalk. Therefore, we recommend this for final examination using phase contrast microscopy only.



**Chemical Compatibility**

The table below provides some basic information on the chemical and solvent compatibility of the μ-Slide Angiogenesis. For a full list of compatible solvents and more information on chemical compatibility, please visit the FAQ section on [ibidi.com](http://ibidi.com).

| Chemical / Solvent | Compatibility                       |
|--------------------|-------------------------------------|
| Methanol           | yes                                 |
| Ethanol            | yes                                 |
| Formaldehyde       | yes                                 |
| Acetone            | yes, without lid                    |
| Mineral oil        | no                                  |
| Silicone oil       | yes                                 |
| Immersion oil      | See <b>Immersion Oil</b> on page 4. |

**Immersion Oil**

When using oil immersion objectives with the ibidi Polymer Coverslip, use only the immersion oils specified in the table below. The use of any non-recommended oil could damage the ibidi Polymer Coverslip. The resulting leakage may harm objectives and microscope components. All immersion oils that are not listed in the table below should be considered as non-compatible.

| Company   | Product                | Ordering No.  | Lot Number | Test Date |
|-----------|------------------------|---------------|------------|-----------|
| ibidi     | ibidi Immersion Oil    | 50101         | 16-12-27   | 01/2017   |
| Zeiss     | Immersol 518 F         | 444960        | 160706     | 01/2017   |
| Zeiss     | Immersol W 2010        | 444969        | 101122     | 04/2012   |
| Leica     | Immersion Liquid       | 11513859      | n.a.       | 03/2011   |
| Cargille  | Type A                 | 16482         | 100592     | 01/2017   |
| Cargille  | Type HF                | 16245         | 92192      | 01/2017   |
| Olympus   | Silicone Immersion Oil | SIL300CS-30CC | N4190800   | 01/2017   |
| Carl Roth | Immersion oil          | X899.1        | 414220338  | 01/2017   |

**Ordering Information**

The μ-Slide Angiogenesis family is available with different surfaces and formats. See table below for choosing your μ-Slide and μ-Plate Angiogenesis, respectively.

**μ-Slide Angiogenesis**



| Cat. No. | Description  |
|----------|--|
| 81506    | <b>μ-Slide Angiogenesis ibiTreat:</b> #1.5 polymer coverslip, tissue culture treated, sterilized |
| 81501    | <b>μ-Slide Angiogenesis Uncoated:</b> #1.5 polymer coverslip, hydrophobic, sterilized            |

**μ-Plate Angiogenesis 96 well**



| Cat. No. | Description  |
|----------|--|
| 89646    | <b>μ-Plate Angiogenesis 96 well ibiTreat:</b> #1.5 polymer coverslip, tissue culture treated, sterilized |

**For research use only!**

Further information can be found at [www.ibidi.com](http://www.ibidi.com). For questions and suggestions please contact us by e-mail [info@ibidi.de](mailto:info@ibidi.de) or by telephone +49 (0)89/520 4617 0.

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