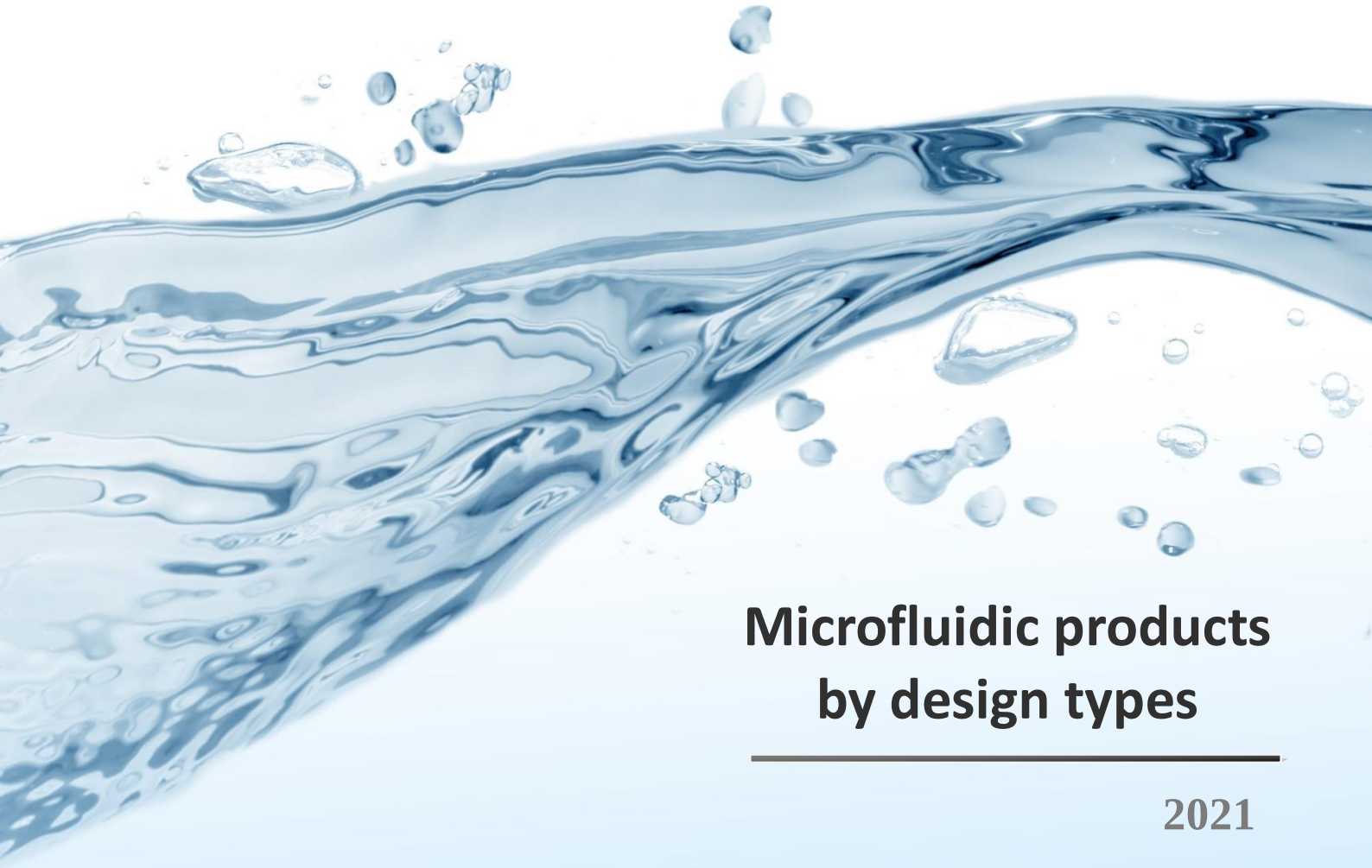
nehir
BİYOTEKNOLOJİ

Microfluidic Lab-on-a-Chip Product Catalogue 1



Microfluidic products by design types

2021

NEHIR BIYOTEKNOLOJI LTD.

MICROFLUIDIC LAB-ON-A-CHIP PRODUCTS

A. MICROFLUDIC PRODUCTS BY DESIGN TYPES

1. BASIC MICROFLUIDIC CHIPS

These are called as "Flow Cell", containing microfluidic channels of various widths and depths on standard 76 x 26 mm microscope glass dimensions. Height Z: 5 um – 300 um, Width X: 5 um – 10 mm and Length Y: 1mm – 70mm. Inlet ports diameter sizes can be between 0.5mm-5mm, although they must be compatible with the fitting or tubing to be used.

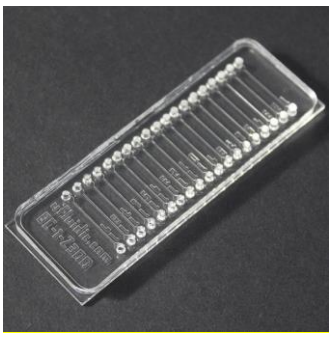
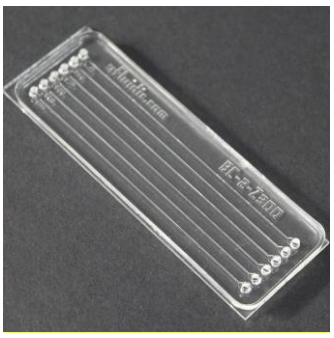
*** Applications:**
- Flow Cell Applications
- Concentration Gradient

*** BC1/BC2/BC3 Basic Parallel Microchannel Chips:**
https://www.ufluidic.com/collections/basic-microchannel

These chips are a single-line microchannel for basic applications requiring small volume sample analysis. The inlets of the microchannels are compatible with single or multiple micropipettes or syringes. These parallel channels are numbered on the chip. Microchannel dimensions are given in the feature list. *"For different microchannel sizes, please request special production."*

*** BC4 Concentration Gradient Microchannel Chips:**
https://www.ufluidic.com/collections/basic-microchannel

It is necessary to study the different concentrations of the solutions and suspensions, which have been examined in many studies, diluted in equal proportions (1/2, 1/3, 1/4, ...) to determine the target amount. Thanks to laminar microflow and diffusion, automatic dilution and gradient formation within the chip can be achieved.

BC1 Basic Parallel micro Channel	BC2 Basic Parallel micro Channel - long version	BC3-V2 Basic micro Channel FlowCell	BC4-GR1-Z100 Concentration Gradient
			

2. DROPLET MICROFLUIDIC CHIPS

Droplet flow or droplet formation chips are the second of the three basic flow types of microfluidic technology (laminar flow, droplet flow, digital flow). Droplets emerge in a special bottleneck inside the microchannel when two different phase fluids (liquid-gas, water-oil, gel-water, etc.) do not mix. The liquid that passes into the droplet form is called the droplet phase, dispersed phase, or emulsion phase. The fluid that surrounds it and allows the droplets to emerge is called the continuous phase.

Adjusting the size of the droplets formed is possible with two features: 1- The ratio of the flow rates of the continuous phase and the dispersed phase to each other, 2- The geometry and dimensions of the bottleneck channels used for droplet production.

Two techniques are used to produce droplets or particles in microchannels; passive and active formations. All of the chips in our portfolio use the passive droplet formation technique. The passive technique is the formation of droplets and particles as a result of the natural flow of fluids, taking advantage of the special structure of geometry in the micro-channels. The passive formation technique is more widely used than the active droplet formation technique, due to the simplicity of device design and manufacture, and approximately similar results. Active technique, integrated into micro-channels; an external energy input is usually required, while electrical, magnetic, centrifugal effect, etc. require an additional source of activation.

Channel design in microfluidic devices is also important in droplet formation and particle generation volume. There are three main types of production channel strait designs; T-cross flowing, flow focusing, and 3D CO-flowing geometries. Our chips in our portfolio are designed and manufactured according to T-cross flow or flow-focused geometries.

Chip products containing droplet microfluidic devices are available on standard 76 x 26 mm microscope glass sizes, at various throat widths and channel depths. Although the produced droplet sizes vary according to the chip properties, their diameters are; it can be adjusted between 5um-500um. Inlet ports diameter sizes can be between 0.5mm-5mm, although they must be compatible with the fitting or tubing to be used.

*** Applications:**

- Micro Encapsulation
- Drug Effect Analysis in Single Cell
- Single Cell Omix Analysis
- 3D Cell Culture

*** DG-1/2/3/4/CC1/CC2 Droplet Generation Microfluidic Chips:**

https://www.ufluidic.com/collections/droplet-generation

These chips that can be used for the production of droplets of various sizes. There are sub models that use T-Join and Flow Focusing techniques as production logic. In addition to the existing designs (DG-CC1/2), there are designs developed by NehirBT (DG-1/2/3/4) in the literature. With these designs, water-in-oil (w-o) or oil-in-water (o-w) emulsions can be created.

*** DG-DropSeq-Z120 Drop-Seq Droplet Generation Microfluidic Chip:**

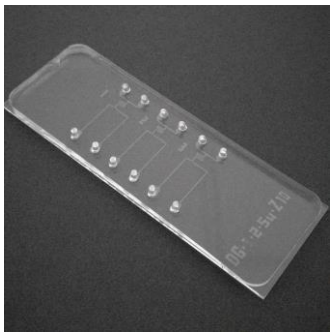
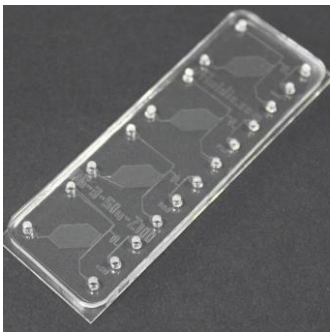
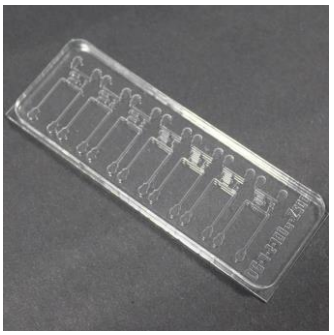
https://www.ufluidic.com/collections/droplet-generation

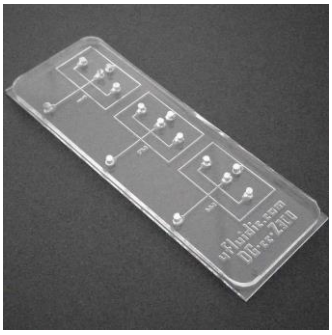
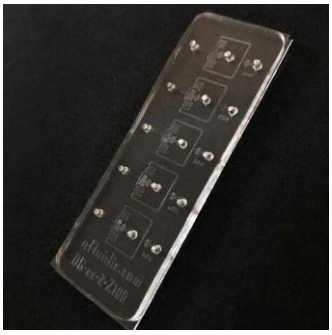
This product is the original design of Drop-Seq technology and was originally developed by Macosko et.al. (2015, Cell). Drop-Seq technology enables researchers to perform transcriptome sequencing and expression quantification analyzes at the single-cell level.

*** Multi-Layer Droplet Generation Microfluidic Chips: 2DG/3DG:**

https://www.ufluidic.com/collections/droplet-generation

These chips are suitable for use as a droplet generation chip in multiple layer counts. Water-in-oil-in-water (w-o-w) or oil-in-water-in-oil-in-water (o-w-o-w) production studies can be done.

DG1-5um-Z10 Droplet Microfluidics Chips	DG2-25um-Z40 Droplet Microfluidic Chips	DG3-50um-Z100 Droplet Microfluidic Chips	DG4-100um-Z500 Droplet Microfluidic Chips
			

DG-CC1-Z300 Open Source Droplet Microfluidics Chip	DG-CC2-Z100 Open Source Droplet Microfluidics Chip	DG-DropSeq-Z120 Droplet Microfluidics Chips
		

3. CELL CULTURE MICROFLUIDIC CHIPS

In the drug development process; between in vitro tests and animal experiments, there is a need for an innovative technique that will increase the success of clinical studies by completing the shortcomings of both. The techniques of tissue printing with three-dimensional bioprinters and simulating tissue sections with LOC devices are very promising in this regard and are useful in the realization of the 3R directive (reducing, improving, or replacing animal experiments). Microfluidic tissue simulation chips are based on physical-chemical-biological simulation of sections of target organs in microchannels, where critical activities can be studied. The products in this section are devices without cells for general use only. It can be coated with collagen, matrigel, or suitable biomaterials to prepare cells for culture.

*** Applications:**
- Organ-on-a-Chip
- Disease and cancer modeling
- Drug discovery and toxicity
- Food and drug allergy

*** TChipD1 Basic Tissue Chip:**
https://www.ufluidic.com/collections/tissue-on-chips

These are single-channel devices that are used to gain initial experience in straight channels and to optimize cell culture in microchannels when starting Tissue/Organ-on-a-chip applications. The medium wide area is for the culture of cell lines. For easy cultivation of immobilized cell lines or primary cell cultures, inlet ports or custom PDMS microchannels can be used without affixing to the substrate.

*** TChipD2 Cell Movement (Migration) Tissue Chip:**
https://www.ufluidic.com/collections/tissue-on-chips

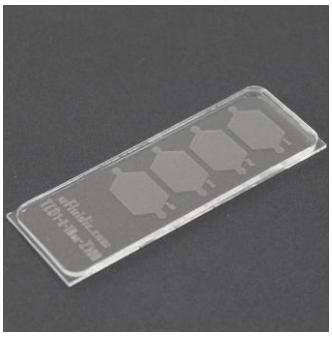
These are devices with three and six parallel channels for cell migration (eg, metastasis of cancer cells) applications. The middle wide area of the chip is for cell-tissue culture, while the parallel channels on the sides are for observing, for example, the migration-attack movement of metastatic cells. Between the channels there are spaces where normal cells cannot fit or pass, but through which metastatic cells can pass, similar to the movement of metastatic cells in the same blood vessel.

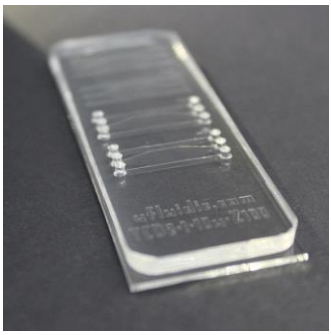
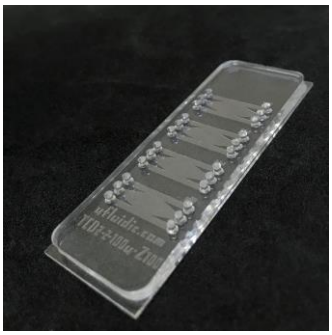
*** TChipD4 Permeability Chip:**
https://www.ufluidic.com/collections/tissue-on-chips

It is the most famous organ-on-a-chip design. It is mostly used when modeling Endothelial-Epithelial cell layer sections of tissues. With a membrane with 0.45-micron pores between the lower and upper microchannels, two different cell layers do not come into direct contact with each other, nor do they lose their molecular communication. While the lung chip is the most well-known application in the literature, its use in different tissues is increasing.

*** TChipD5 Axon Chip:**
https://www.ufluidic.com/collections/tissue-on-chips

This is a double channel device for axon communication applications of neuron cells. The two large areas are for the mutual culture of different neuron cells, and axon extension takes place within the thin 10 micron channels between them. The effect of the target molecule, drug, and genetic changes on inter-axonal communication can be examined at the single axon level with chips.

TChipD1-1-5m-Z100 Basic Tissue Chip	TChipD1-2-10m-Z100 Basic Tissue Chip	TChipD5-Z310 Axon Chip
		

TChipD2-1-10um-Z100 Cell Migration Tissue Chip	TChipD2-2-100um-Z100 Cell Migration Tissue Chip	TChipD2-4-100um-Z100 Cell Migration Tissue Chip
		

4. HYDRODYNAMIC FOCUSING AND PARTICLE SORTING MICROFLUIDIC CHIPS

As a subject of laminar flow, which is the first of the 3 types of flow that should be known in microfluidic chips; it is the ability of cells and/or particles to be manipulated in liquids flowing side by side without mixing according to their dimensional and physical properties and under special design disintegrating effects. Particles added externally or produced on chips; can be synthesized in certain sizes under an external or internal influence, collected in one place in microchannels, arranged in a row, separated from large-small and flexible-rigid, or similar applications can be realized.

*** Applications:**
- Nanoparticle and drug/vaccine nanocarrier synthesis
- Lyososome encapsulation of drugs and vaccines
- Cell/particle focusing for biosensors
- Exposure of parallel liquids by laminar flow
- Cell/particle separation

*** HDF-1 / 2 / 3 / 4 Hydrodynamic Focusing Chips:**
https://www.ufluidic.com/collections/hydrodynamic-focusing-and-particle-sorting

Hydrodynamic focusing is the creation of very thin controllable contact surfaces and flow paths as a result of the compression of side-by-side parallel fluids by taking advantage of the laminar flow feature under certain flow values in microchannels. Our portfolio includes products with a different number of input and output ports and different focuser channel lengths.

*** SpS-1 / 2 / 3 / 4 Spiral Particle Sorting Chips:**
https://www.ufluidic.com/collections/hydrodynamic-focusing-and-particle-sorting

These are chips that contain spiral microchannels to focus or separate particles and cells differentiated according to their size. It works according to the principle of "inertial microfluidics" and its formula is as follows;
Particle/cell with [PARTICLE DIAMETER / Dh> 0.07] can sort particles/cells with diameters larger than 3.5 microns with the formula [DH = 4 x SECTIONAL AREA / ENVIRONMENT].

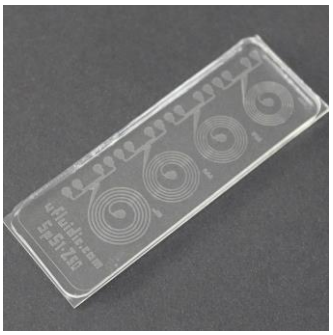
*** UMACS Magnetic Activated Cell-Particle Sorting Chips:**
https://www.ufluidic.com/collections/hydrodynamic-focusing-and-particle-sorting

Surface proteins, cytoplasm molecules, or cells whose structures are marked with magnetic particles, and magnetic particles coated on the surface can be separated from other molecules or particles with high efficiency in the microfluidic chip.

*** DEP Di-Electrophoresis Cell-Particle Sorting Chips:**
https://www.ufluidic.com/collections/hydrodynamic-focusing-and-particle-sorting

Within the microchannel, a dielectrophoretic force occurs as a result of the polarization of uncharged and different size or electrical properties particles in different directions in an irregular electromagnetic field (usually by applying alternating current over opposing electrodes of different sizes). With the effect of this force, the particle moves in the positive or negative direction (in the direction of the area where the magnetic field is more or less), being affected by the force, and is separated in microchannels. With the effect of DEP, the characterization, separation, collection-transportation of particles and cells in the mixed population can be performed within the microfluidic chip.

HDF1 Three Inlet HydroDynamic Focusing Chip	**HDF2 Five Inlet HydroDynamic Focusing Chip**	**HDF3 Two Inlet HydroDynamic Focusing Chip**	**HDF4 Double-Three Inlet HydroDynamic Focusing Chip**
			

SpS-Z50 Spiral Particle Sorting Chip	⇨ SpS-Z50 Spiral Particle Sorting Chip	**UMACS-1-9mm-Z100-m20x6x2 Microfluidic Magnetic Activated Cell-Particle Sorting**	⇨*UMACS-1-9mm-Z100-m20x6x2 Microfluidic Magnetic Activated Cell-Particle Sorting*
			

5. MIXING CHEMICAL/ BIOLOGICAL REACTION MICROFLUIDIC CHIPS

In laminar flow, which is the primary type of flow of microfluidic systems, even if the liquids do not mix, diffusion occurs on the contact surfaces and after a while, passive mixing with each other can be achieved. By using special geometries, laminar flow can be forced and liquids can be mixed. Liquids are passively mixed by diffusion in chips with a serpentine stirrer microchannel of substrates. Pumping devices must be used to activate the fluid flow at a constant rate. High volumes of production in these chips, which are suitable for mass production, are achieved thanks to the continuous flow. If these liquids are reactive, the reaction takes place with high efficiency in the nano-pico-volume area in the microchannels. Integration is also possible with special activation methods such as lighting with light, heating with a heat source, magnetic forces. Another important advantage of realizing chemical-biological reactions in microfluidic channels is that they can work with limited volumes and that environmentally harmful productions are kept protected.

*** Applications:**
- Flow chemistry synthesis reactions
- Biological enzymatic reactions
- Nanoparticle and drug/vaccine nanocarrier synthesis
- Drug/vaccine encapsulation with liposome

*** SM-1/2 Serpentine Mixing Microfluidic Chips:**
https://www.ufluidic.com/collections/serpentine-mixing

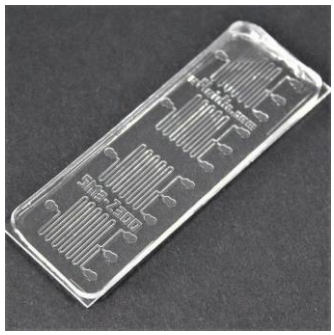
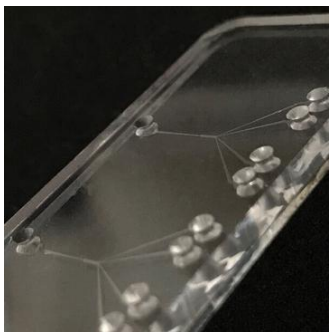
There are models with thin and wide microchannels are available for short and long-duration reactions. The serpentine shape of the channels is to increase the effectiveness of the diffusion mixture and to form long channels on small chips. It is possible to study the interaction of two or more liquids. By using special fittings, different volumes of liquids can be transferred from the inlet with different pumps, and the output products can be used in tubes or devices for further studies.

*** BM1-Z50 Bifurcating Mixing Microfluidic Chips:**
https://www.ufluidic.com/collections/mixing-channel-microfluidics/products/bm1-z50-bifurcating-mixing-microfluidic-chips

During laminar flow, fluids are more likely to mix in regions of unsymmetrical sudden contraction and expansion. By making use of this feature, it is possible and advantageous to directly mix up to 4 liquids with each other in a very short time and channel length. It is especially useful in liposome nanoformulation encapsulation.

*** HBM1-Z100 Herring-Bone Mixing Microfluidic Chips:**
https://www.ufluidic.com/products/hbm1-z100-herring-bone-mixing-microfluidic-chips

During laminar flow, fluids are more likely to mix in regions of unsymmetrical sudden contraction and expansion. By taking advantage of this feature, the mixture is provided by descending and expanding in the opposite direction of gravity. This special geometry is preferred for many different flow syntheses in the literature.

SM1-300um-Z300 Serpentine Mixing Microfluidic Chips	**SM2-100um-Z100 Serpentine Mixing Microfluidic Chips**	**BM1-Z50 Bifurcating Mixing Microfluidic Chips**
		

6. MICRO-STRUCTURED SURFACES MICROFLUIDIC CHIPS

Micro-patterned or structured surfaces; It is frequently used in in vitro cellular and particle analysis studies for single-cell imaging, different culturing of the heterologous cell population, and formation of cellular geometries. For example, researchers can classify cells inside microchannels in our chips because cells of interest adhere to the patterned surface, and cells that do not adhere can be rinsed away. As another example, researchers can use micro-patterned surfaces to transfer nanomaterials to different surfaces utilizing mold lithography.

*** Applications:**
- Differentiated 3D surface cell culture
- Patterned nanomaterial printing

*** SS-1/2-5u-Z5 Pillar/Line microSurface Chip:**
https://www.ufluidic.com/collections/micro-structured-surface

Micro surfaces are produced in two types as columns and lines. While the lower surface of the channel is shaped, the upper part of the channel is an open and empty flow cell. Shaped surfaces can be produced from PDMS or PMMA material, depending on the interaction suitability of cells or nanomaterials. Again, depending on the application of the user, the shaped surface and the microchannel on it can be sent open to the researcher, either joined or to be combined later.

7. MICROORGANISM ANALYSIS MICROFLUIDIC CHIPS

Microfluidics is a new technology that is increasingly used in biological experiments. Microorganisms are mostly found in sizes 5um and smaller. Instead of standard Petri dishes or tubes, specially designed nanoliter volumes are needed for their detection individually or with a biosensor. Microfluidic structures are also suitable for bacterial or fungal assays with a minimum resolution of 1 micron. Given the cellular size of microorganisms, creating precisely controlled conditions at such small sizes makes it ideal to explore cell-cell and cell-environment interactions. Thus, a wide range of problems in microbial ecology can be studied using engineered microbial habitats. Artificial microfluidic ecosystems can serve as model systems for testing ecology theories and principles applied at a higher level in the biological organizational hierarchy.

*** Applications:**
- Genotype-Phenotype Monitoring on Bacteria

*** MChipD1-1um-Z31 Mother Machine Chip:**
https://www.ufluidic.com/collections/microorganism-on-chips

These model chips ensure that the bacteria are compressed into a very thin channel, and the new generation of bacteria is constantly produced without moving from their places. While different environmental effects and molecules are transferred from the middle channel, genotype and phenotype changes of newly multiplying bacteria or plasmid etc. loads can be tracked.

CUSTOM DESIGN MICROFLUIDIC CHIP PRODUCTION

When quality and high-resolution microchannels are needed in research projects, the production of chips with an affordable budget is possible through service procurement. It may seem logical for researchers to produce microfluidic devices with their teams and possibilities, but in projects with a sufficient budget, it is more meaningful to outsource from a professional microfluidic PDMS device manufacturer to meet the need for high quality and resolution microfluidic chips. As NehirBT, we meet this need with our uFluidic brand.

*** Applications:**
- PDMS microfluidic chip production
- UV lithography

*** Custom Design PDMS Microfluidic Chip Production:**
https://www.ufluidic.com/collections/custom-fabrication-service

Since there is no accepted standard for the materials used in the production of microfluidic chips, it is necessary to choose between various materials according to the characteristics of the applications. PDMS (PolyDiMethylSiloxane) is one of the most preferred materials in terms of price performance. Soft lithography production of PDMS chips requires a rigid mold. High-resolution mold production is produced by UV laser lithography device using SU8 photoresist coated silicon substrate. Mold production with coarser resolution and lower cost can be performed with 3D SLA/DLP using photosensitive resins.

Service of Custom Design and Fab of PDMS Chips by 3D Printed Molds	⇨Service of Custom Design and Fab of PDMS Chips by 3D Printed Molds	**Service of Custom Design and Fab of PDMS Chips by SU8 Molds**	⇨Service of Custom Design and Fab of PDMS Chips by SU8 Molds
			

MICROFLUIDIC ACCESSORIES

Regardless of the fabrication material and application of microfluidic chips, interconnection solutions are required for transferring sample liquids into microchannels. This solution may be with a cavity to directly drip sample liquid, a fitting for attachment to the pumping device, a holder or similar. Fluid transfer can be passively by self-transfer of fluids, or actively by an external pumping device (pressure, syringe, vacuum, peristaltic, electroosmotic, etc.). In active flow situations, chip inlets, fluid reservoirs, and pumps, fittings, fittings, connectors, and tubing are required. Unfortunately, today, a standard has not been established for microfluidic chip geometry and connectors. Therefore, each company requires the implementation of its solution. As NehirBT, we design our fittings and produce them with a 3D printer and produce perfect solutions to this problem.

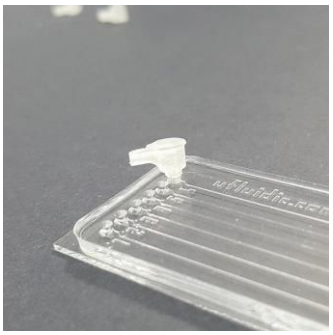
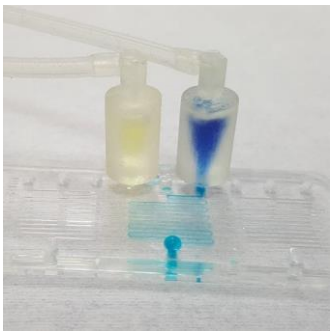
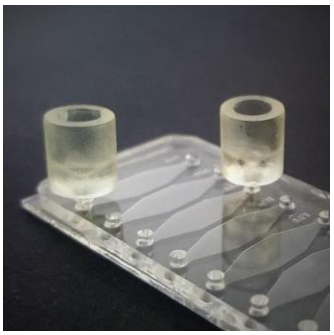
*** Applications:**

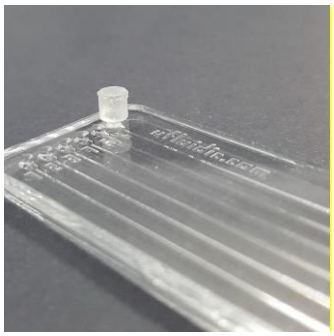
- Active flow, and passive flow, chip holders; with magnetic or screw
- Sensor cartridge
- Pump, syringe and tubing fittings
- Reservoirs and chambers

*** Microfluidic Accessories:**

https://www.ufluidic.com/collections/microfluidic-accessories

All parts are produced with a 3D SLA/DLP printer. As standard, the chip inlet diameters of all parts are 2 mm. There is an absorbent chamber that is attached to the outlet part of the chip, which draws and flows by itself. There are suitable apparatus attached to the inlet of the chip, which allows the use of all the samples in limited volumes, and which are attached to the tubing and provide the connection between the chips, and which are attached to the syringe tip and the chip inlet port.

MBE212 **Fitting: Tubing to Chip**	**MBE-EH1-1 Fitting: Absorbing Reservoir to Chip**	**MBE-H12** **Fitting: Reservoir to Chip**	**MBE-H22** **Fitting: Open Reservoir to Chip**
			

MBE122 **Fitting: Tubing to Double Tubing**	**MBE452 Fitting: Syringe to Tubing, fits Luer-Lock tip**	**MBE512** **Fitting: MicroPipette Tip to Chip**	**MBE612** **Fitting: Stopper to Chip**
			

*** Custom Production Microfluidic Accessories:**

https://www.ufluidic.com/products/service-of-custom-mbe-3d-printed-microfluidic-acccessories

All parts are produced with a 3D SLA/DLP printer. The fasteners needed can be designed and produced according to the needs of the user.

Service of Custom MBE 3D Printed Microfluidic Acccessories	
	

DIGITAL MICROFLUIDIC TECHNOLOGY

Microfluidic lab-on-a-chip technology is associated with 4 different flows: Laminar flow, droplet flow, digital flow, and paper-based flow. Among them, digital flow is realized by applying current pixel by pixel to the droplets in a microchannel formed on the electrodes in the form of a string and providing the flow movement of the droplets. For the formation of droplets in the microchannel, the lower electrode surface and the upper cover must be covered with hydrophobic and dielectric layers. Liquid movement is achieved by applying an AC current to the electrodes at the bottom, using a technique called "electrowetting". The liquid droplet moves over the current applied electrode pixels and stays away from the non-current pixels.

*** Applications:**

- Biosensors
- Point of care testing

*** EW-DigiChip-1 Electrowetting Digital Microfluidic Device:**

https://www.ufluidic.com/collections/electrowetting-digital-microfluidics

The electrowetting part is produced on PCB as a gold electrode array. Thin-film PDMS is coated on the electrowetting layer. The microfluidic channel part is made of PDMS material. Fluid delivery can be automated manually with a micropipette or by tubing. The manipulation of liquid droplets is controlled via computer software.

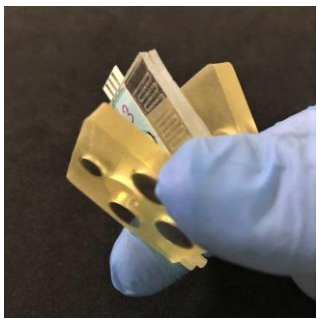
ELECTROCHEMICAL SENSOR MICROFLUIDIC TECHNOLOGY

Electrochemical sensors; mostly a thin film of nitrocellulose, acetate, etc. measurement and reference electrodes on the layer of gold, silver, carbon, etc. It is produced by shaping high conductive, low oxidation electrodes by the "screen-printing" method. While trying to analyze sample liquids by dripping on the electrodes, the flow cartridge required for the analysis of sample liquids at high volumes and low concentrations can be produced with microfluidic chip technology. When the electrochemical sensors are placed in the microfluidic cartridges as fully closed, they can be used safely by amateurs next to the case, while openable flow cartridges are preferred by professional researchers in laboratories.

*** Applications:**
- Biosensors
- Point of care testing

*** MBE-HÜCREK-S-1 Cartridge for ElectroChemical Sensors:**
https://www.ufluidic.com/products/mbe-hucrek-s-1-cartridge-for-electrochemical-sensors

The preparation of the electrochemical sensors is inserted into the microchannels together with the magnet holder for the purpose of integrating them into the cartridge chip and replacing the sensor or cartridge when necessary, by squeezing it between the supplied or specially produced EC sensor. Magnetic holders with internal tubing ports are produced via 3D printing. Microchannels jamming EC sensors are fabricated and used as PDMS chips.

MBE-HÜCREK-S-1 Cartridge for ElectroChemical Sensors	
	

INSTRUMENTS

Additional devices are needed for liquid flow inside microfluidic chips and analysis of sample liquids content. Peristaltic, syringe, pressure control, and micro-pumps for fluid flow control; various types of microscopes for channel imaging; sensor and optical equipment for sensor analysis is the first thing that comes to mind. In our device portfolio, various pumping systems to be used for the transfer of sample liquids to the microchannel are available for domestic production.

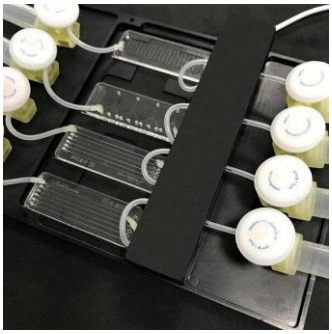
*** Applications:**
- Organ-on-a-Chip
- Flow cell applications
- Micro encapsulation
- Flow chemistry synthesis reactions
- Nanoparticle and drug/vaccine nanocarrier synthesis
- Cell/particle separation
- Biosensors

*** CuP- Circulation micro Pump; Automation of on-chip cell culture feeding:**

https://www.ufluidic.com/products/u-cup-perfusion-circulation-micropump

In Organ-on-a-Chip products, external pumping devices are required for long-term feeding of cells with a long-term medium and for automated controlled drug-chemical-biological exposure in all applications where cells are cultured within the chip. Although current syringes and pressure pumps meet this need, researchers need easier, more mobile, and economical systems due to their size, the inability to move the system, and automation difficulties.

Circulation microPump (CuP) can transfer 4 different liquids (15mL or 50mL) to a maximum of 4 different microfluidic chips at the same time with 4 piezoelectric or 2 peristaltic pumps on it. If desired, waste liquids can be collected in 4 different tubes or cyclic feeding can be made. Flow rate and duration controls are made with mobile devices via Bluetooth. It can be used with a 5V power supply or mobilized with an external battery. The laminar flow hood can be easily transferred between the microscope and the incubator without disturbing the fluid flow system.

U-CuP Perfusion Circulation microPump	
	

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