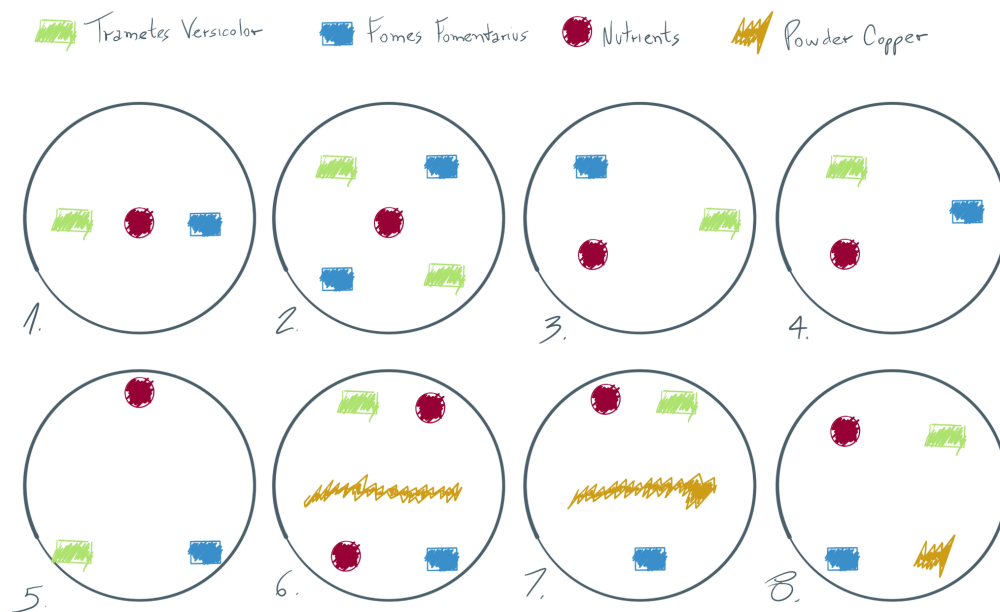


In the first phase, the project aims to observe the behavior of two species of Fungi, *Fomes fomentarius* and *Trametes versicolor*, through their interaction, whether it be symbiotic or competitive, in order to develop conceptual frameworks for artistic projects based on these relationships.

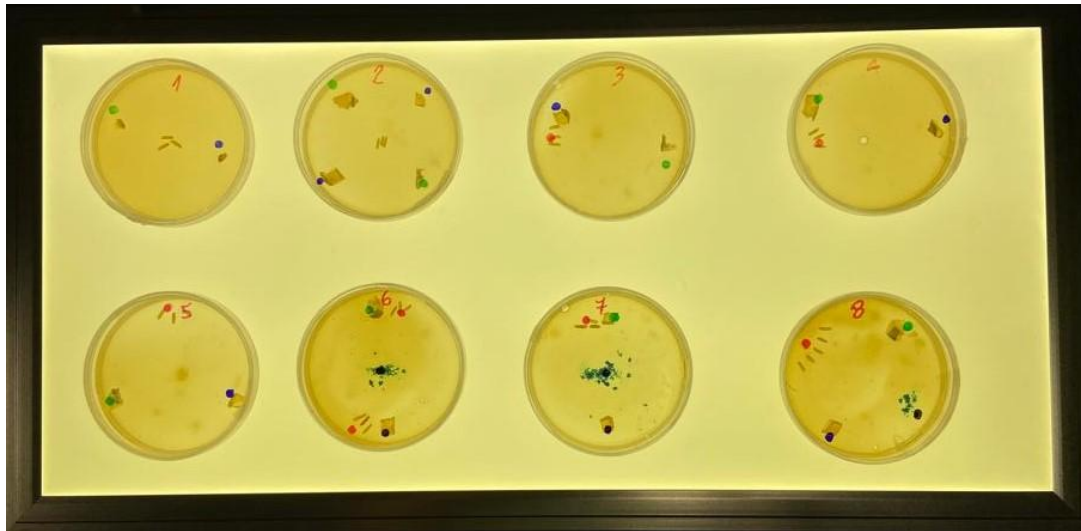
### Phase 1: Conceptual development



Conceptual drawing of the layout for the first experiment.

In this phase, with the goal of observe how the both species will relate, on May 24, 2023, eight experiments were conducted using the two different species of Fungi, *Fomes fomentarius* and *Trametes versicolor*, cultivated on malt-extract agar in standard Petri dishes

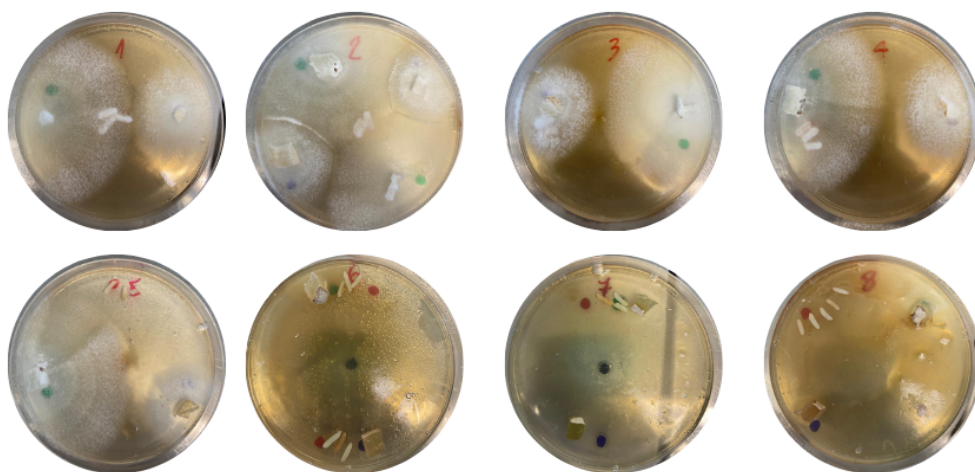
. Three of these experiments involved the use of copper powder to repel the fungi, and in all of them, rice grains were added to instigate competition for resources between the species. In the image below, the green dots represent samples of *T. Versicolor*, the blue dots represent samples of *F. Fomentarius*, and the black dots represent copper powder.



*The setup of the first experiment in Petri dishes (05/24/23).*

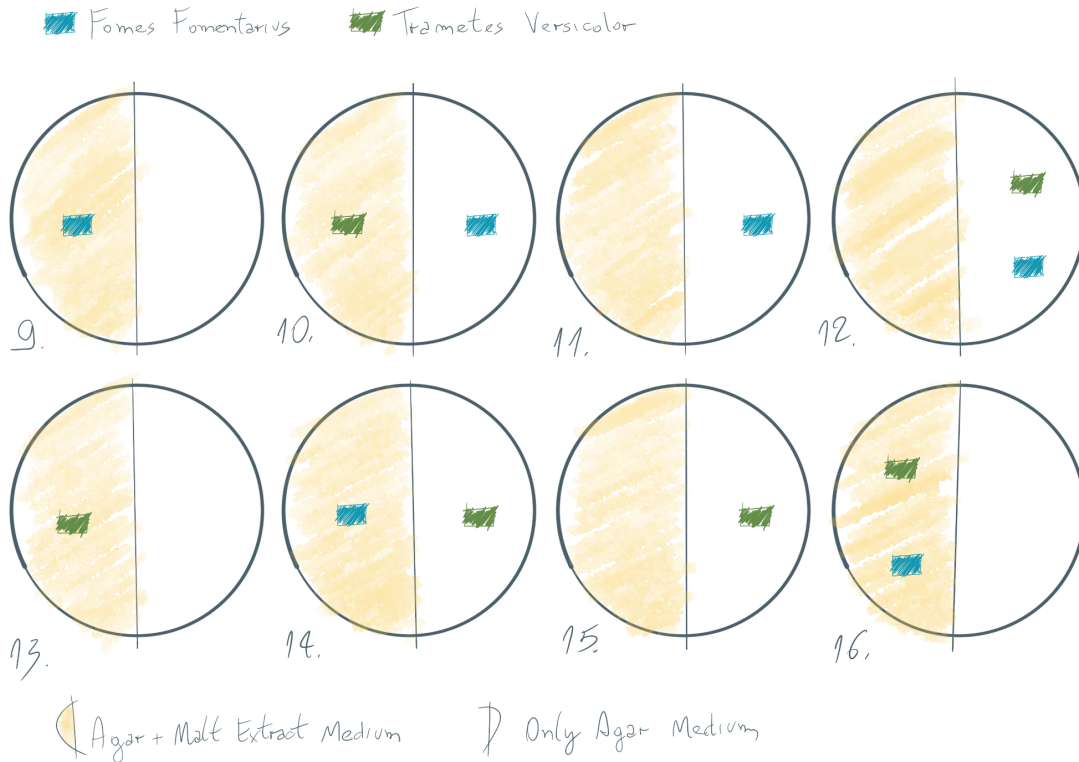
The Fungi were placed in an environment with natural light and an average temperature of 25 degrees for 6 days. After this period, the interaction and behaviors were described:

- *T. Versicolor* grows at a faster rate compared to *F. Fomentarius*.
- The two species did not compete for nutrients, as the agar and malt extract compound already provides nutrients, and the presence of rice grains resulted in an excess of nutrients in the sample.
- In experiment number 2, a natural dividing line was observed between the two species, but no signs of stress (darkening) were observed.
- In samples 6, 7, and 8, the copper sulfate powder dissolved in the agar, and as a result, neither species developed.



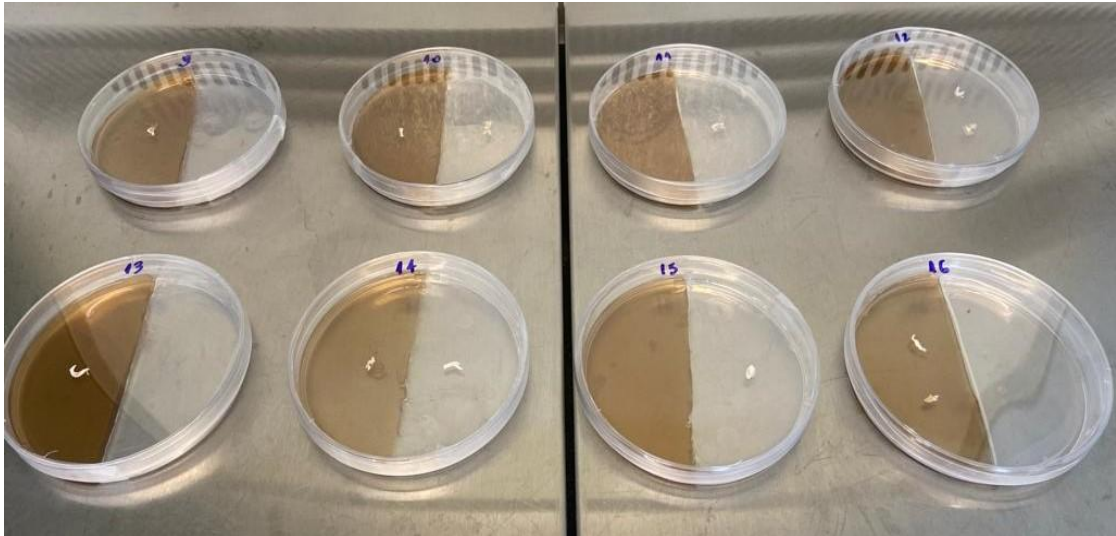
*The results of the first experiment (30/05/23).*

## Second Phase: Intense Territorial Disputes



*Schematic drawing of the second phase of the research.*

In this phase, after observing the shapes and textures resulting from the interaction among the fungi, eight new experiments were conducted, with the main idea of making new setups to make the competition for space more evident. For this purpose, in each Petri dish was added half substrate with nutrients (malt extract), and the other half without, using just agar. The fungal species were positioned to incite the search for nutrients, and in case these nutrients were found in territories already dominated by another species, we observed the possible interactions that could occur.



Setup of the second experiment (31/05/23):

The Fungi were placed in an environment with natural light and an average temperature of 25 degrees Celsius for a period of 13 days. In this experiment, new observations were made, revealing an interesting interaction between the two species and resulting in samples with an appealing and aesthetically pleasing appearance.

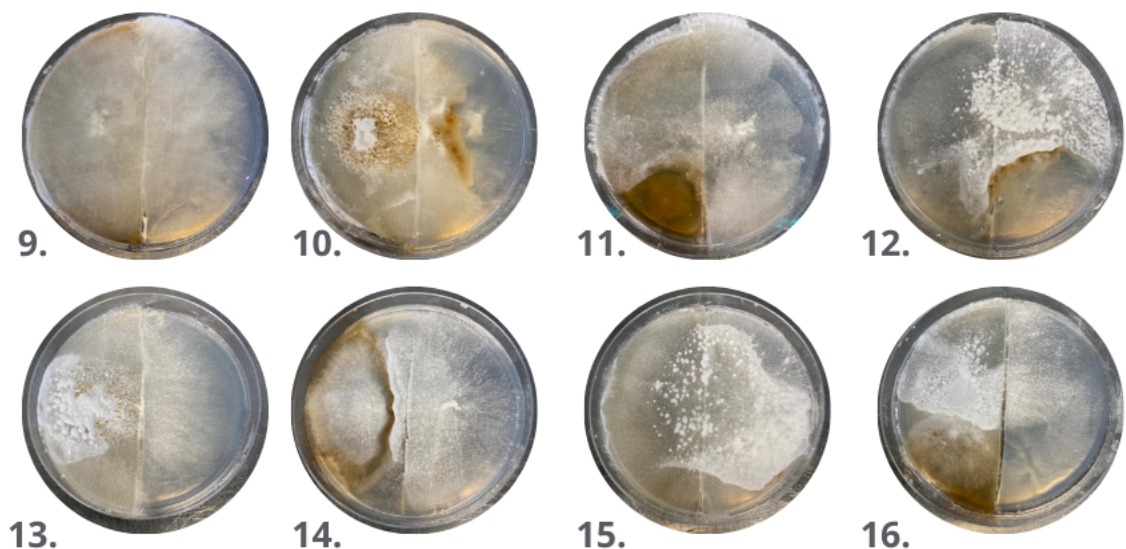
In this phase, four different behaviors were observed: the preference of the fungi for the side of the Petri dish that is more nutritious, the emergence of new textures resulting from the interaction between the two fungi, the reaction of the mycelium to a species that contaminated the experiment, and the ability to define the shape of the interaction, thus designing the conflict pattern. This was achieved by carefully positioning the starter inoculants in the Petri dish, following the growth pattern predictions evinced by the previous experiments.

- In experiments 9 and 13, where the species are grown individually, it was observed that they indeed prefer the side of the Petri dish that contains nutrients. For example, in sample 13, the *Trametes versicolor* clearly develops in greater abundance on the left side of the sample.
- In samples 10 and 14, where both species were placed on opposite sides of the Petri dish, an interesting interaction and competition for nutrients occurred. In sample 10, the *Fomes fomentarius* is able to interact with the *Trametes versicolor* in a friendly manner, resulting in a speckled texture of brown and white, indicative of the interaction between the two species. On the other hand, in sample 14, the *Fomes fomentarius*, positioned in the nutrient-rich region, forms a brown barrier around its culture, indicating that the Fungus is under stress. The *Trametes versicolor* is unable to overcome this barrier.
- In Petri dishes 11 and 15, where the species grow individually in nutrient-free regions, we also observe a healthy development of Fungi. In sample 11, an invasive organism, possibly a



result of contamination during preparation, is clearly delimited in the lower left part of the experiment, without coming into contact with *Fomes fomentarius*. In sample 15, it is interesting to note how *Trametes versicolor* develops compactly in the nutrient-free area, apparently being able to transport nutrients from one end to the other.

- In experiments 12 and 16, the fungal samples were placed together, with both being placed on the nutrient-free side in experiment 12, and the opposite in experiment 16. It is curious to observe that these two experiments are essentially mirrored. *Trametes versicolor* grows more abundantly and dominates the space in both experiments. However, *Fomes Fomentarius* appears to be stressed, indicated by its brown coloration, and remains confined to a small space in the corners of the Petri dish.



*Results of the second phase of experiments (06/13/23)*

### **Third Phase: Deconstructing Conflict (Summaery)**

In this final phase, after observing the mycelia in two different experiments aimed at instigating conflicts, battles, and territorial disputes, I reached a point where I found myself replicating scenes of war between the two species. In this sense, the third phase aims to utilize the interaction between the two Fungi to establish symbols of harmony and peace.

By cultivating the mycelia, we create a visual metaphor for the coexistence and interaction of divergent ideas and perspectives. The intertwining and connection of the Fungi symbolize the need to build bridges between different viewpoints, providing space for mutual understanding and the construction of collaborative solutions.

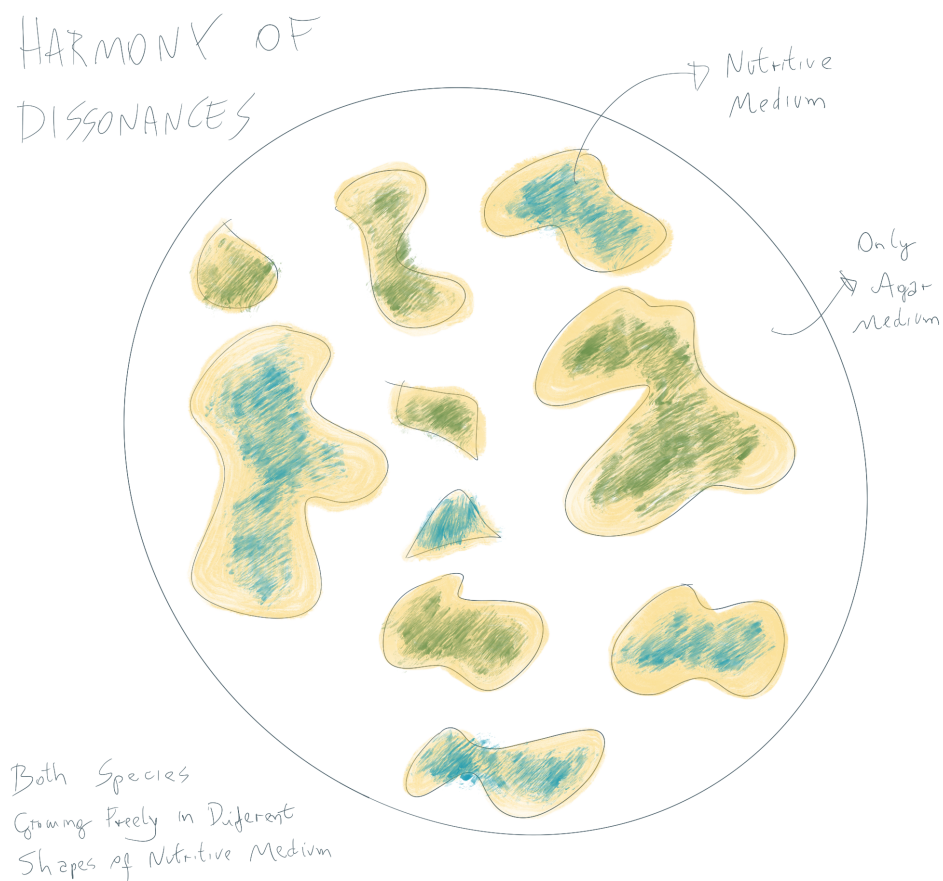
Currently, there are over 17 countries at war in the world, some caused by third-party countries while others are civil wars. Beyond the term "war" itself, a significant part of the planet still

sustains conflicting ideologies such as racism, misogyny, and LGBTQIA+ phobia. Therefore, this stage of the project is also an invitation to adopt the perspective of mycelia and contemplate what we can learn from their conflicts and harmonious relationships.

All the installations shown below will be carried out at BioLab, using Petri dishes of the largest available size, to ensure a wide visualization of the experiments. The cultivation medium will be the classic agar with malt extract, and only agar in some cases. The installations are scheduled to begin on 27/06/23, to be ready by Summaery.

### Installation 1: Harmony Of Dissonances

In this installation, the idea is to cultivate fungi in contrasting forms and positions, representing the coexistence of different perspectives and viewpoints. This installation symbolizes the pursuit of harmony within diversity, respecting differences as a positive force.



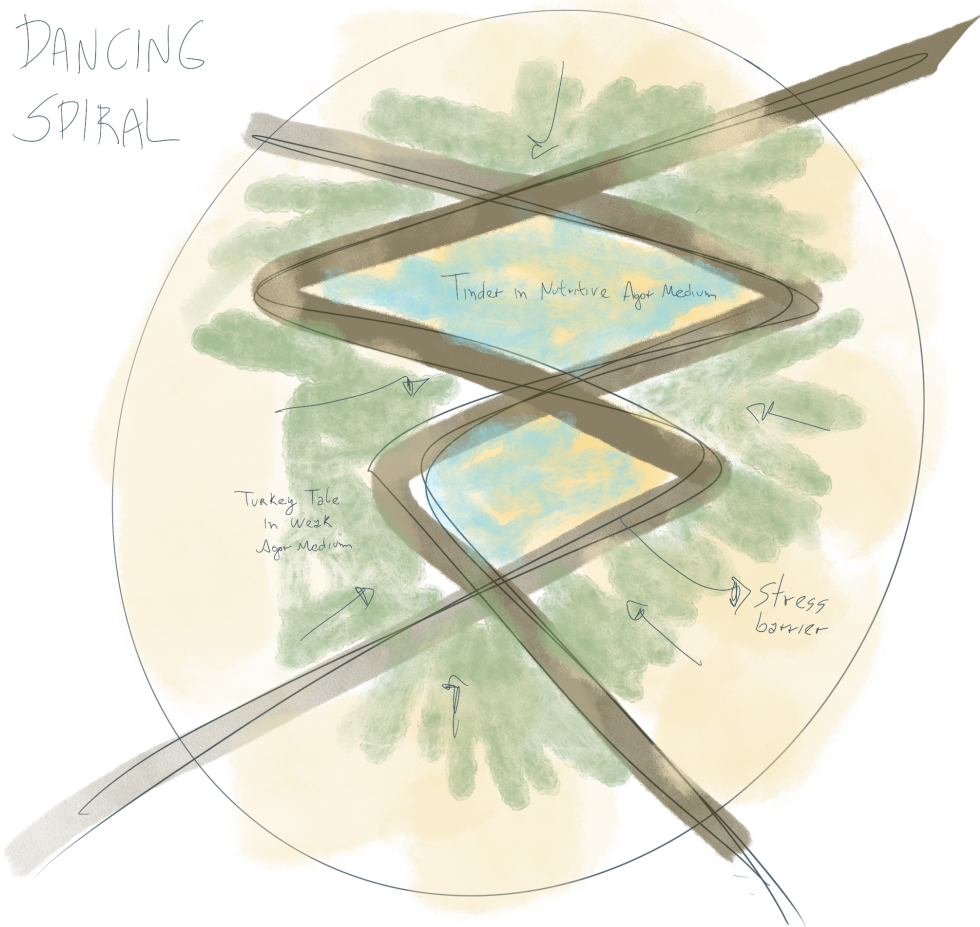
To create this representation, the following premises will be used:

- The Petri dish will be filled with agar.
- Random shapes with nutritious agar will be positioned in the Petri dish.
- Different species of mycelia will be positioned in the nutritious agar.

The idea is for the mycelia to develop freely in the unique space created for each species and then interact with each other in various ways. The base of this Petri dish will be isolated agar, as such, a nutritionally uninteresting space for the Mycelia will be created. The goal is for this non-nutritive space to be an environment in which the fungi connect without the element of competition.

### **Installation 2: Dancing Spiral**

In this installation, the idea is to make Fungi dance in a spiraling shape, symbolizing continuous and cyclical transformation. Dance is an important tool for transformation and harmony, as it allows for the expression of emotions, storytelling, and the fostering of connection between people. It is unique in each region of the world, reflecting the culture, traditions, and specific values of each community, conveying its identity and promoting cultural diversity. Through dance, people can connect with their roots, celebrate their differences, and find a sense of belonging, promoting harmony and mutual understanding.



To create this installation, the following premises will be followed:

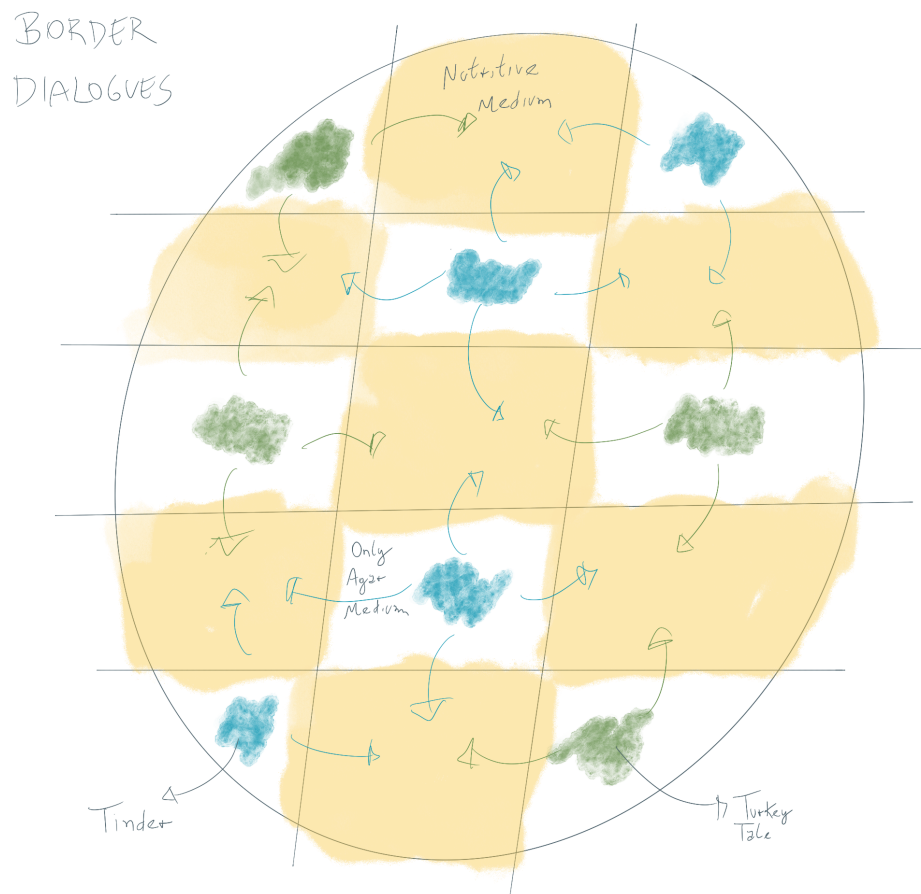
- Agar with low amounts of nutrients will be poured in the Petri dish.
- Parts of the first layer of agar will be removed, and a layer of nutrient-rich agar will be added.
- The *T. versicolor* species will be positioned on the low-nutrient agar.
- The *F. fomentarius* species will be positioned on the nutrient-rich agar.

The idea is to allow the *T. Versicolor* mycelium time to grow until the *F. Fomentarius* reaches the nutrient-rich agar. After this encounter, it is expected that the mycelium will develop stress lines, creating the spiral shape representing the dance between the species.

### Installation 3: Border Dialogues

In this installation, the aim is to create an agar grid pattern that represents bordering territories: the agar grid will be composed of squares containing nutrients and squares lacking them. Fungi positioned in nutrient-deprived areas will have to establish dialogue among different species

and cultures that have migrated to the nutritious environment. This installation symbolizes the ability to resolve conflicts through mutual understanding and constructive communication.



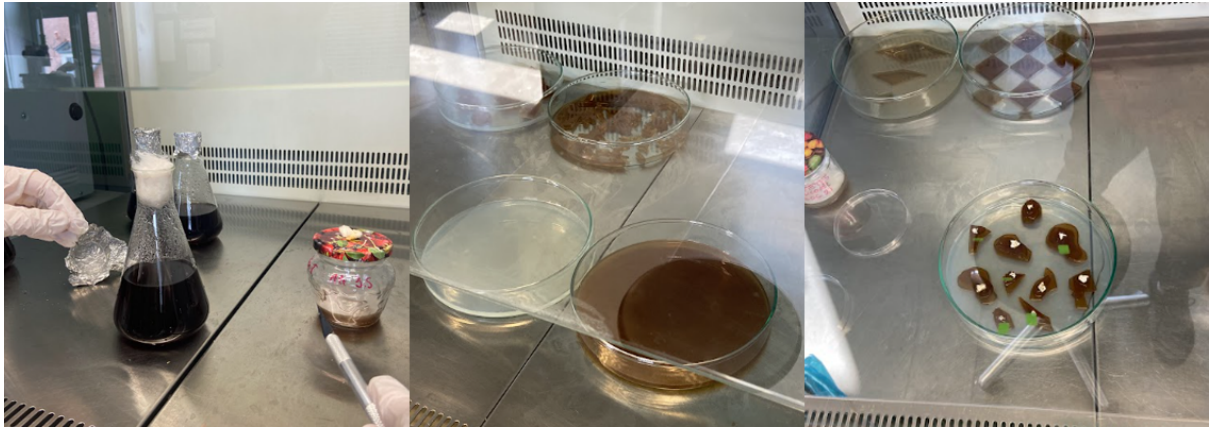
To create this installation, the following steps will be followed:

- Add an initial layer agar
- Remove square-shaped grids from the first layer and fill them with nutritious agar.
- Add the species of mycelium to the grid areas where agar is present.

The idea is to create various random zones of encounter between the species, which would serve as "borders," in order to stimulate dialogue about the division of nutrients. It is expected that the grid will remain intact, even if it is not geometrically perfect, due to the stress that occurs when one species encounters another.



## The Assembly



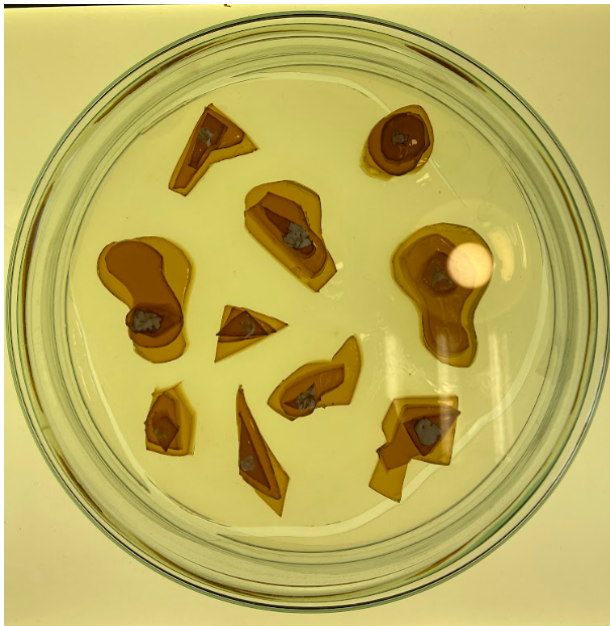
*Photographs of the isolation chamber during the assembly of the pieces.*

On June 28th, the assembly of the pieces began at the Bauhaus BioLab. For preparation, the following components were used:

- 3 Petri dishes of 200x40 mm
- 600 ml of agar solution with malt extract
- 400 ml of agar solution
- 1 sample of *T. Versicolor* with 7 days of incubation
- 1 sample of *F. Fomentarius* with 7 days of incubation
- Blade
- Spoon and spatula

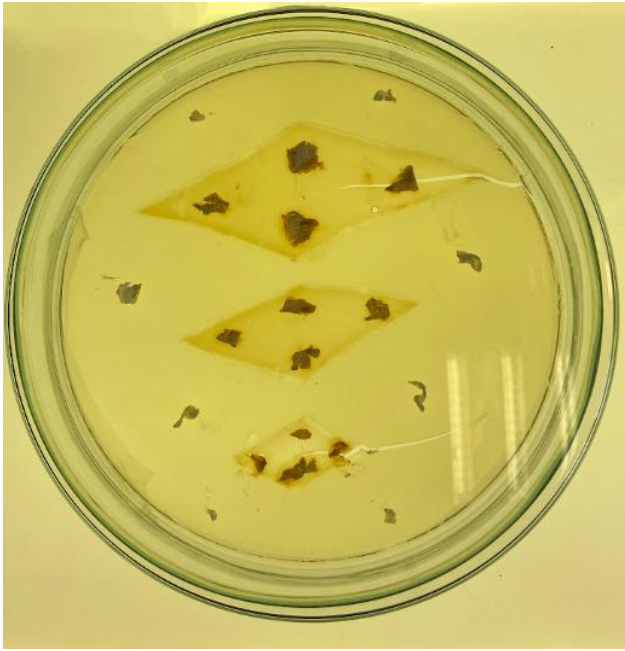
## Harmony of Dissonances

For this Petri dish, a layer of agar was prepared, and multiple layers of agar with malt extract were added with the intention of representing a set of mountains through the topography. The samples of mycelium were positioned according to the reference drawing for this artwork.



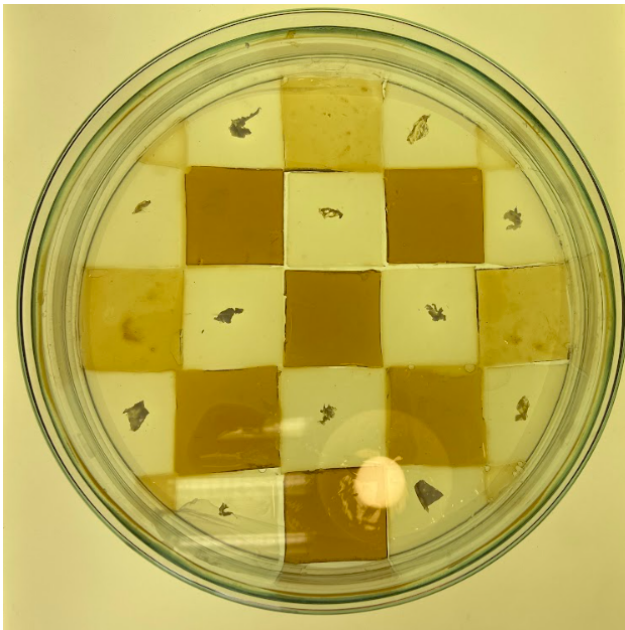
## Dancing Spiral

In this Petri dish, initially, a layer of agar with 1/5 of the malt extract ratio from the original recipe was added. After this, diamond-shaped holes were created and filled with agar and malt extract. The *F. fomentarius* mycelium was positioned in the most nutritious areas, while the *T. versicolor* mycelium was placed in the less nutrient-rich parts.



### **Border Dialogues**

For this Petri dish, a layer of agar and a layer of agar with malt extract were applied on each side of the dish. These layers were cut into squares to construct the framework of the artwork. Following this, the mycelium was positioned in the non-nutrient areas of this grid.



## Results

The mycelium exhibited optimal and healthy growth, with no contamination observed in any of the Petri dishes. The anticipated behaviors were mostly realized. The following photographs were taken on July 12th, prior to the start of the Summaery.

### Harmony of Dissonances



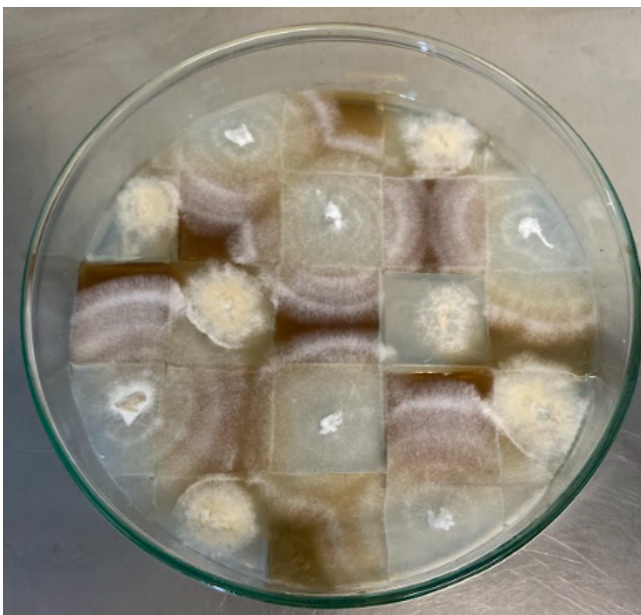
In this experiment, the obtained interaction demonstrates that *T. versicolor*, primarily due to its rapid growth rate, manages to achieve a higher dominance of space and begins to interact with the territory of *F. fomentarius*.

## Dancing Spiral



In this experiment, *F. fomentarius* successfully develops a strong and dense biomass, creating this opaque white pattern in the center of the Petri dish. Stress lines are present, which form an intriguing design within the artwork and demonstrate success in the intended interaction.

## Border Dialogues





In this experiment, once again, *T. versicolor* takes control of the space and manages to reach nutrient-rich territories more easily than *F. fomentarius*, which maintains a steady but reserved growth.

### **Exhibition of Artworks at Summaery**

Photographs from the "Biosphere Extractions" exhibition during the Bauhaus Summaery 2023.

