

WILLIAM MYERS

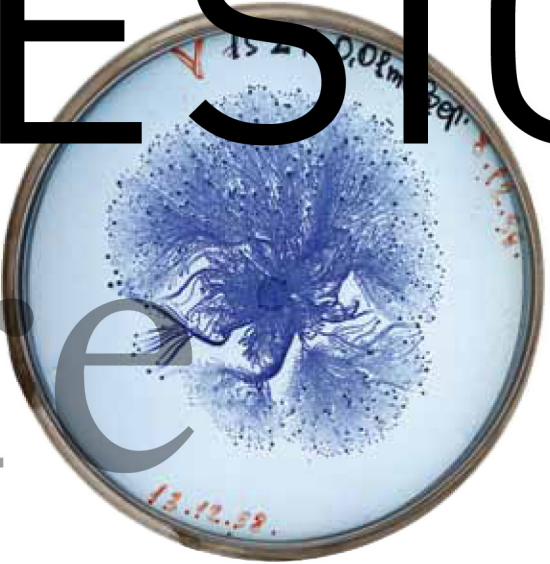
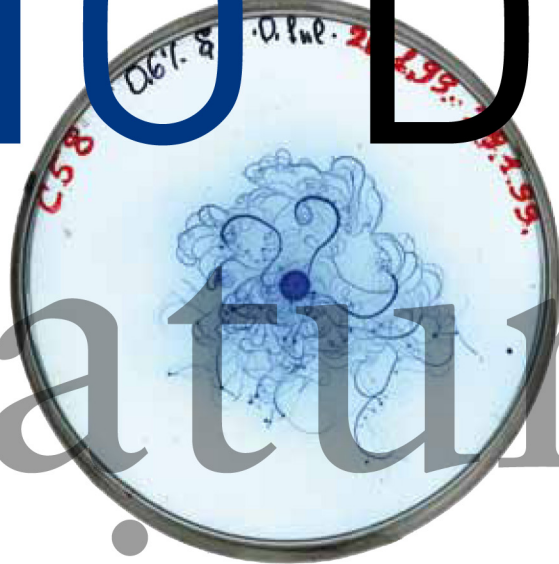
# BIO DESIGN

nature

science

creativity

MoMA



# ACTIVE MODULAR PHYTOREMEDIATION

Using plants to reduce the need for power-hungry mechanical ventilation.

Hybrid hydroponic plants (including English Ivy, Golden Pothos, Boston Fern), organic plant media mix, rhizosphere microbial communities.

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PROTOTYPE

This team has created a prototype to help improve indoor air quality while reducing pressure on energy-hungry heating, ventilation, and air-conditioning systems. It is well understood that contemporary construction materials and designs negatively impact the internal environment of buildings, thereby contributing to health problems for many people. This situation is often worsened by the high levels of pollution in urban spaces that typically surround these edifices. The active modular phytoremediation system works to address this issue with a design that is both elegant and low energy.

Modular pods that contain a variety of hydroponic plants are mounted to a wall. The growing method used for the plants has the advantage of exposing their roots, resulting in three to four times the efficiency compared with potted plants, in which air filtration occurs through the leaves. In this scenario, air is directed across the roots, which absorb airborne toxins, including volatile organic compounds and particulate matter, which are harmful to people. Since these particles are taken in at the root level and not through the leaves, the plant does not become toxic. The air-cleaning system is scheduled to be installed and tested in the Public Safety Answering Center II, a Bronx emergency response center in New York.



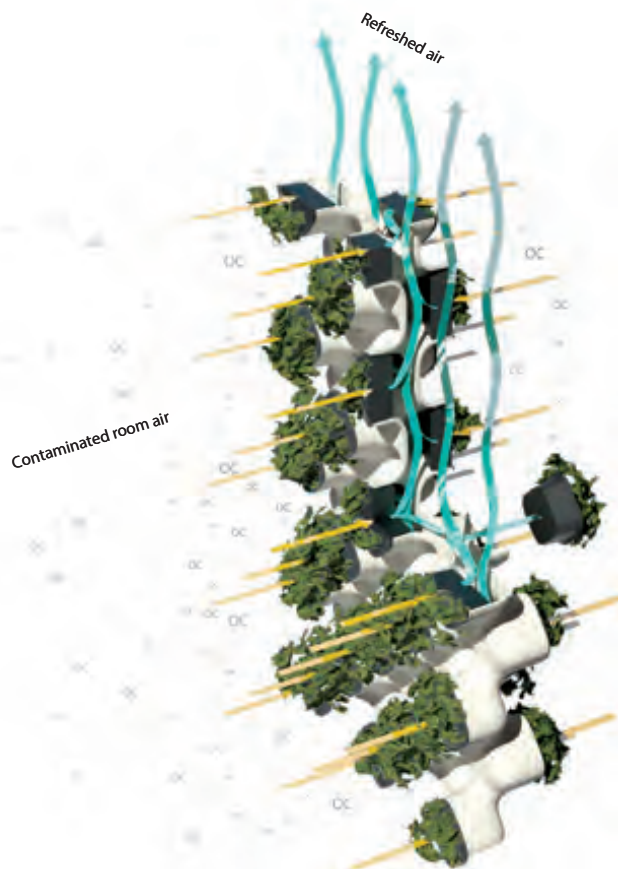
ABOVE

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By exposing the plants' roots and channeling air over them, the system exploits the air-cleaning ability of microorganisms that digest toxins and thus prevent their harmful effects on humans.



ABOVE 149  
 A variety of hydroponically grown plant species can be wall mounted in modular, plastic pods.



ABOVE 150  
 Rather than draw in and circulate air from the immediate surrounding environment, which may be polluted, the system 'scrubs' the air with both natural and low-energy mechanical processes.



ABOVE 151  
 Modularity allows the arrangement to be scaled up where space and light are available, helping to reduce the need for energy-intensive heating, ventilation, and air-conditioning solutions.