

poly:eutopia

Designing with Non-Humans: Alternative Urban Models for Ecological Regeneration.

In the face of the climate crisis, crossed planetary boundaries, biodiversity loss, and fragmented ecosystems, there is an urgent need to rethink how we live in and design urban environments. Current systems remain predominantly anthropocentric, often overlooking the profound interdependencies between human and non-human actors coexisting in urban ecosystems. These tend to marginalize non-human agencies, treating nature merely as a resource, tool, or backdrop—rather than as an active participant in city-making processes. This project challenges such approaches by exploring interspecies collaboration not just as an act of care and responsibility, but as a necessary condition for survival in a time of climate crisis and advanced environmental degradation. It asks how collaboration with non-humans can inform alternative urban models for ecological regeneration.

The case study focuses on *Physarum polycephalum* (slime mold), a single-celled organism known for its spatial problem-solving abilities and commonly applied in transportation network modeling. Rather than using it as a tool for human-centered optimization, this work investigates how collaboration with *P. polycephalum* can inform the co-creation of ecological corridors as essential elements of regenerative cities. To do so, the research combines experimental prototyping, laboratory observation of *P. polycephalum*, network simulations based on its growth patterns, and speculative mapping techniques. This methodological approach aims to uncover new, non-anthropocentric spatial logics for ecological corridors. Currently, such corridors are often reduced to green, land-based (often limited to canopy-level) migration routes, overlooking underground networks and the broader interconnectedness of ecosystems. This approach limits our understanding of species movement and interactions, neglecting the multidimensional, entangled nature of ecological connectivity. Inviting *P. polycephalum* into the process not as a biological tool, but as a design partner opens up new ways of thinking. Its decentralized, self-organizing, and emergent behavior challenges traditional planning and offers an alternative way of designing space—relational, adaptive, and non-hierarchical. Through this lens, its behavior inspires a new framework for ecological corridors—one that reveals hidden connections between urban habitats and expands our understanding of critical urban infrastructure. Infrastructure understood not only as technical systems, but as a medium for the flows of life and relationships. Ultimately, this research calls for a paradigm shift toward regenerative, interspecies cities—a move from designing *for* or *with* nature to designing *as* nature. Poly:eutopia is not a utopia. It is a practice of new design—empathetic, interdependent, and symbiotic.

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