

meet the

This slime is sublime.

*M*ycophiles have the luxury of naming convention confidences—think of the fall-off-the-bone tenderness of chanterelles, the adorable syllabic chassis of enoki. Even the psilocybin club has regal gravitas: Liberty caps. Golden teachers.

Now compare that to slime mold's most popular nickname: dog vomit. Often overlooked and rejected, slime mold's poetry is that of an underdog—odd, blobby, and generally damp.

Slime molds, like Pluto, were kicked out of their classification—a fungal demotion with a much smaller PR budget. Appearing as plumes, bulbs, or slurries of mobile splats, slime molds tend to be mistaken for a funky cousin of mushrooms, but they're technically no part of the mushroom family. They're no animal or plant either, belonging to the protist camp of typically unicellular organisms, including algae, amoebas, and plasmodium. When we see slime molds in the wild (on rotting logs, forest floors, fallen fruit, mulch, dissected air conditioners), we often see a technically individual cell swishing around a rich jelly of cell components, capable of dividing and regrouping in slick synchronization.

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slime

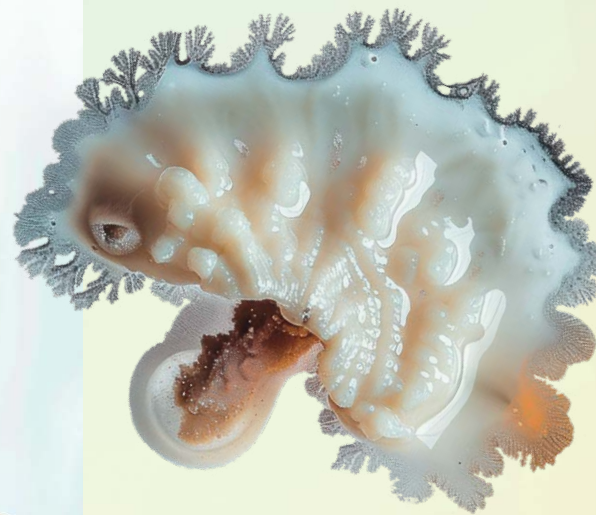
molds





Like their mushroom neighbors, slime molds eat bacteria and organic decaying matter and serve as substrates and shelters for various forest life. When the environment is rich in available eats, slime molds typically function as individual amoebas in constant check with their environment, sensing, signaling, self-regulating—sans eyes or ears. If food is scarce, the amoebas band together to form a “slug,” inching along and then transforming into a stalk with a fruiting body to release spores and reproduce.

Found on every continent with over 900 known species, slime molds are clearly making it work. They come in a variety of textures and colors, from raspberry pink and neon orange to ivory blobs reminiscent of cauliflower heads and cottage cheese. Chocolate tube slime mold moonlights as a brunette hairpiece turned Koosh ball, and wolf’s milk slime mold shows off with rosy pearls. Range, indeed.



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Let’s take a vote on the most evocative slime mold epithet: Is it scrambled eggs, the colloquial “dog vomit,” or ninth-century Chinese scholar Twang Ching-Shih’s “demon droppings”?

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The only known night-blooming orchid, first described by botanists in Papua New Guinea in 2011, is hypothesized to beckon slime-hungry nocturnal pollinators by mimicking slime mold with its dangling appendages.

One in particular, *Physarum polycephalum*, has been garnering international attention for its unique skill set rather than its looks. This bright yellow slime mold is tackling computational algorithms, inspiring bio-informed solutions to network design conundrums and reimagining smart cities.

A milestone fame moment for *Physarum polycephalum* was over a decade ago, when researchers at Hokkaido University in Japan successfully grew a slime mold model of the Tokyo rail system. They marked a mini model of Tokyo and surrounding towns with oat flakes and waited as the slime mold stretched itself to find the oat food source. The slime mold retreated from the longer, cumbersome routes to reform into a thicker body along the shorter, more efficient routes. Pulsing along at 4cm an hour, the slime mold closely mapped the existing railway map via the following steps: open exploration, then refinement of its veins to optimize the quickest transport of nutrients, tendrils routed to perfection. This was dubbed “cellular computation,” an intelligence without a brain.

Researchers found it has externalized spatial memory, too; it leaves behind a film of where it’s been, much like pheromone-depositing ants or breadcrumbs Hansel and Gretel. It can navigate complex environments, it can gauge time and space, it can learn, it can remember and it can share knowledge when fusing with other slime molds. The navigation principles that underpin slime mold’s think-smart-not-hard mentality have offered a “plasmodium’s point of view” to chart Iberian roadways, the U.K.’s M6 motorway, the roads of ancient Rome, and highway systems in the U.S., Mexico, China, Brazil, and Germany. Simulations derived from slime mold by U.S.-based researchers have even recharted networks to have the same, or in some cases, faster travel time as the “real thing,” with up to 80% more resilience in cases of disruption.

Slime mold offers insight into

efficient routes for moving not just people around a city, but other resources, too. Architects, educators, authors, and ecoLogicStudio founders Marco Poletto and Claudia Pasquero are confident that biocomputational systems derived from slime mold bring a more sustainable approach to urban design. ecoLogicStudio’s installation *GAN-Physarum: la dérive numérique*—part of the permanent collection at the Centre Pompidou in Paris—is a “bio-painting” that spotlights a generative adversarial network AI algorithm trained from slime mold’s foraging patterns.

Reinterpreting the urban fabric of Paris through the perspective and capacities of slime mold, the bio-algorithm maps and redistributes the city’s biotic resources, taking into account the flow of water, energy, and waste to encourage carbon neutrality, energetic self-sufficiency, and resilience against climate change.

“Slime mold produces a different method of computation, one that focuses on interaction rather than control,” said Pasquero, whose urban planning ethos carries a similar charge—conversational, interconnected, and symbiotic with the living planet. “Slime mold can teach us about energy distribution and apply that reflection to the complex dynamic of the city. It’s a different mode of thinking and interacting with the world around us.”

Poletto, who characterizes slime mold as a brilliant decision-making muse, emphasizes that slime mold is completely shaking up how we think about zoning, architecture, computation, and intelligence itself. Slime mold’s intuitive and decentralized foraging logic is inspiring other urban designers, city planners, and transport professionals, as well as robotics engineers, computer scientists, autonomous vehicle experts, and creatives. This paradigm-shifting magic offers a kind reminder: To build more connected and resilient communities, we ought to collaborate more closely with the natural world, instead of veering further from it.

