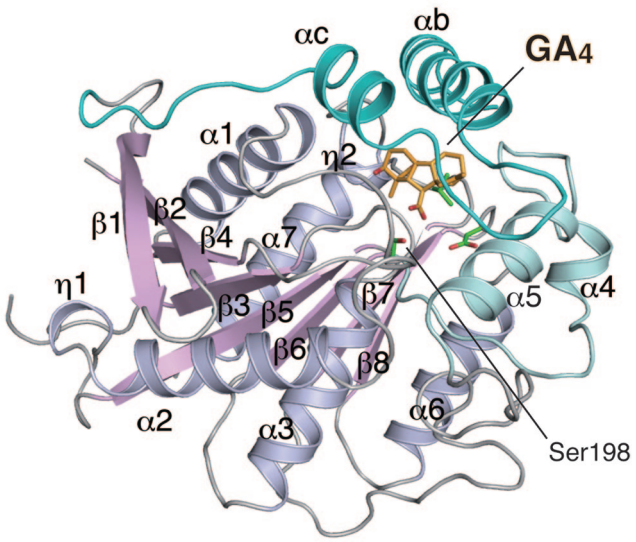

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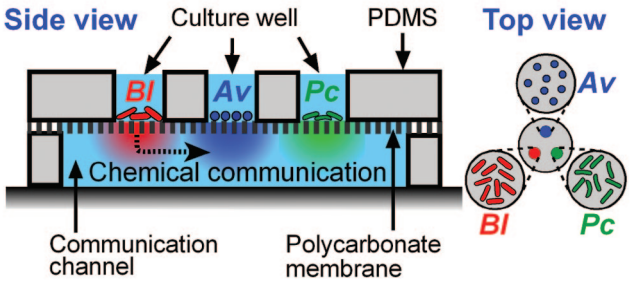
notable exception appears in the function of an amino-terminal lid. In HSLs, the lid covers the substrate-binding site and opens upon substrate binding. In contrast, in GID1, the lid is open in the absence of substrate and closes upon GA_4 binding. GA_4 is held in place by a network of hydrogen bonds, as well as a host of nonpolar interactions that are thought to facilitate the closing of the lid over the binding pocket. Mutants in which residues thought to be involved in GA-binding were changed to alanine showed little to no activity, confirming their critical role in GA recognition. The observation that most of the residues important for GA-binding are conserved within plant GID1s but not in HSLs suggests that GID1 likely evolved from HSL, recruiting residues that resulted in high affinity and selectivity for specific GAs that induced a desired biological response. Interestingly, some lower plant GID1s contain nonconserved residues and as a result have lower affinity and specificity for certain GAs. The authors propose that GID1s in higher plants have evolved highly specific recognition elements that enable them to capitalize on the growth-stimulatory properties of specific GAs. **Eva J. Gordon, Ph.D.**

Microbes Need Their Space

Communities of microbes coexist in nature, and the organisms within the community rely on each other to create a thriving environment. For example, different soil microorganisms perform certain tasks, such as nitrogen processing, decomposition of organic matter, and remediation of environmental contamination, that are essential for the stability and function of their community. Attempts to replicate such communities in the laboratory have been largely unsuccessful, as one species often dominates and, in a quite unneighborly fashion, effectively kills off its neighbors. Building on the observation that, in nature, such communities coexist within matrices with defined spatial structure, Kim *et al.* (*Proc. Natl. Acad. Sci.* 2008, *105*, 18,188−18,193) create a community of three different species of soil bacteria in which the spatial structure is controlled using microfluidics.



Kim, H. J., *et al.*, *Proc. Natl. Acad. Sci., U.S.A.*, *105*, 18188−18193. Copyright 2008 National Academy of Sciences, U.S.A.

The three bacterial species were selected such that each can perform a function necessary for the survival of the community as a whole. *Azotobacter vinelandii* (Av) can employ its nitrogenase to supply nitrogen sources, *Bacillus licheniformis* (Bl) can make use of its β-lactamases to reduce antibiotic pressure from penicillin supplied in the culture medium, and *Paenibacillus curdlanolyticus* (*Pc*) can utilize its cellulases to provide a carbon energy source. When the three species were simply cocultured in a test tube, one species would invariably overtake the population. However, when a microfluidic device was employed to spatially segregate each species but still enable the flow of chemical communication among them, the community was stable. Notably, if only one or two members of the community were present, its population size decreased or remained at initial levels, signifying the need for all three species to support the community. A mathematical model was additionally devised to describe how spatial structure might facilitate stabilization of the community. Given the importance of microbial communities in the environment and in human health, these studies offer an innovative approach toward understanding and exploiting these communities for environmental and medical purposes. **Eva J. Gordon, Ph.D.**

The Power of the Individual

Drugs, especially those that combat challenging diseases such as cancer, can have very powerful effects on cells. Little is known, however, about how and why individual, seemingly identical, cells can respond differently to the same drug. To address this puzzling behavior, Cohen *et al.* (*Science* 2008; DOI:10.1126/science.1160165) investigate proteome dynamics in individual human cancer cells that have been treated with the anticancer drug camptothecin.

In tackling this daunting task, the authors used a retrovirus-based approach called "CD tagging" to fluorescently label ~1000