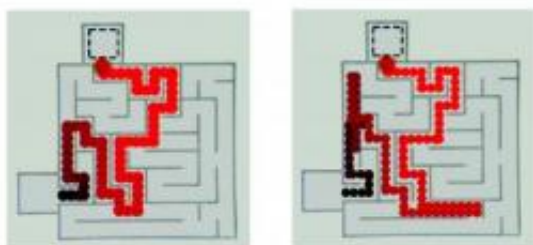


Oil droplets can navigate complex maze (w/ Video)

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Simple oil droplets (in red) can navigate a complex maze using a special chemical approach that could lead to improved delivery of anti-cancer drugs. Credit: American Chemical Society

Call them oil droplets with a brain or even "chemo-rats." Scientists in Illinois have developed a way to make simple oil droplets "smart" enough to navigate through a complex maze almost like a trained lab rat. The finding could have a wide range of practical implications, including helping cancer drugs to reach their target and controlling the movement of futuristic nano-machines, the scientists say. Their study is in the weekly *Journal of the American Chemical Society*.

Bartosz Grzybowski and colleagues note that the ability to solve a maze is a common scientific test of intelligence. Animals ranging from rats to humans can master the task. Scientists would like to pass along that same ability to anti-cancer drugs, for instance, to help these medications

navigate complex mazes of [blood vessels](#) and reach the tumor.

The scientists describe an advance in that direction. They developed postage-stamp-sized mazes, and infused them with an alkaline solution, and placed a gel containing a strong acid at the exit. That created a pH gradient, a difference between the acid-alkaline levels. Oil droplets containing a weak acid placed at the entrance of the mazes developed convective flows in response to pH differences and propelled themselves along the gradient toward the exit. Since [cancer cells](#) are more acidic than other body cells, the experiment may serve as a model for designing new anti-cancer drugs that move along similar acid-based gradients to target diseased cells, the scientists suggest.

More information: "Maze Solving by Chemotactic Droplets", *Journal of the American Chemical Society*.

Provided by American Chemical Society

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