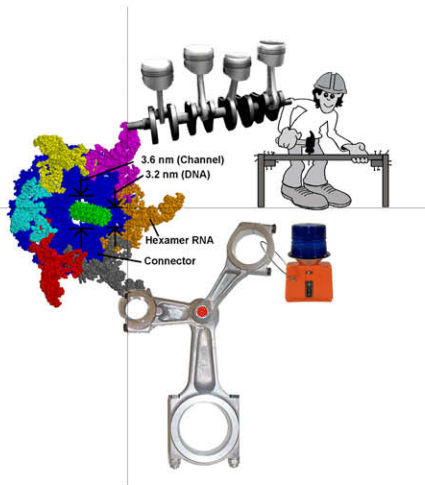


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thursday :: february 06, 2003



rna: life's original seed and nanotechnology

The Purdue University research team that recently created a tiny motor out of synthetic biological molecules has found further evidence that RNA molecules can perform physical work, a discovery that could advance nanotechnology and possibly solve fundamental mysteries about life itself.

Peixuan Guo has discovered how viral RNA molecules bind an energy-bearing organic molecule known as ATP (adenosine triphosphate), which is the crucial substance used to transfer metabolic energy in living things. Now one of life's most mysterious and ancient storehouses of information can be moved by one of its most important fuels. "The fact that RNA can be made to bind ATP in the phi29 virus could imply that these two molecules were among the first to partner in Earth's dance of life," said Guo. He theorizes that because RNA can also bind ATP, it might be not only life's original seed molecule, but also able to direct the release of the energy needed to create life from that seed.

DNA, RNA and ATP are substances long known to be central to life's processes, but knowledge about their many functions in living things is still emerging. It is uncertain whether the RNA in living things has ever directed any of ATP's actions, but for the moment, Guo's group has already found a way to make ATP move RNA around. His team has learned to assemble several strands of RNA into a hexagonally-shaped 'engine' with a strand of DNA functioning as the axle. When fed a supply of ATP fuel, the RNA strands kick against the axle in succession, much like pistons in a combustion engine. Such minuscule motors could find applications in nanotechnology. "The world's smallest machines will need equally small motors to propel them," Guo said. "Ours uses organic molecules as fuel, so no special power source would need to be developed."
>from [* Purdue researchers connect life's blueprints with its energy source*](#). february 3, 2003

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