

Title (en)  
ENZYMES AS A POWER SOURCE FOR NANOFABRICATED DEVICES

Title (de)  
ENZYME ALS ENERGIEQUELLE FÜR VORRICHTUNGEN IM NANOMETERGRÖSSENBEREICH

Title (fr)  
ENZYMES COMME SOURCE D'ENERGIE POUR NANODISPOSITIFS

Publication  
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Application  
**EP 99951914 A 19991013**

Priority  

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Abstract (en)  
[origin: WO0022101A2] A nanoscale engineered system includes the integration of at least one F1-ATPase molecular motor with a nano-electro-mechanical system (NEMS). The resultant functional hybrid organic/inorganic nanomechanical system provides the ability to move nanotechnology into medical and physiologic applications. The ability to accurately and precisely position and orient individual proteins on a substrate is presented. Motive power for the nanomechanical systems disclosed is provided through the genetic expression and integration of at least one F1-ATPase molecular motor, which utilizes ATP as a chemical energy source. In addition, the device is capable of being fuelled with light energy. The NEMS device can be controlled by an "on/off" switch genetically engineered into the F1-ATPase. The NEMS consists of one or more silicon based mechanical devices capable of operating in liquid environments and performing a variety of functions. The F1-ATPase motors are used to pump fluids and open and close valves in microfluidic devices, as well as provide mechanical drives and motive power for nanomechanical devices.

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