Bio-inspired nano-confined membrane: ion transport regulation and applications

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Learning from nature has inspired the creation of intelligent devices to meet the increasing needs of the advanced community and also to better understand how to imitate biology. As one of biomimetic nanodevices, nanochannels or nanopores aroused particular interest because of their potential applications in nanofluidic devices, biosensing, filtration, and energy conversions. Here, inspiration from biological ion channels in nature, we developed some biomimetic smart nanochannels and then applied those smart nanochannels in practical applications such as energy conversion, bioinspired photo-driven ion pump. Such applications with biomimetic nanochannels can not only help people to know and understand the living processes in nature, but also inspire scientists to study and develop novel nanodevices with better performance for the mankind.

References

Figures

Figure 1: A) Biological nanochannels membrane. Nanochannels in electric eel for discharging. B) Biomimetic smart nanochannels. C) Nano-confined membrane for salinity gradient energy generation