Electronic Supplementary Material (ESI) for Nanoscale

Supporting Information

Selected Region Functionalized Fungi with Magnetic Targeting Properties and Versatile Purification Capabilities

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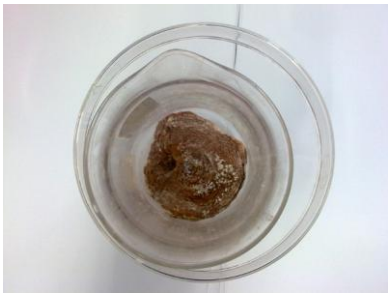

Figure S1 The beginning of this investigation: a rotten apple

The entire investigation on selected region functionalized fungi was started at the beginning of 2011 with some unexpected issues. One spring morning, my wife gave me an apple before I went to the labotory. Unfortunately, I forgot and left it in a drawer for about 3 weeks. After I found the rotten apple, I felt so sorry and decided to do something with this apple. So I examine the surface of the apple by scanning electron microscopy. The net-like morpholgy of the rotting fungi reminded me of a series of investigations reported by Dr R. Gopal, Dr V. Thavasi and Professor Seeram Ramakrishna (J. Membr. Sci., 2006, 281, 581–586; Energy Environ. Sci., 2008, 1, 205–221). They explored the removal of micron sized particles by using artificial membranes with similar net-like morphology. These interesting experience inspired me to consider the potential applications of this natural microorganisms in pollution treatment .

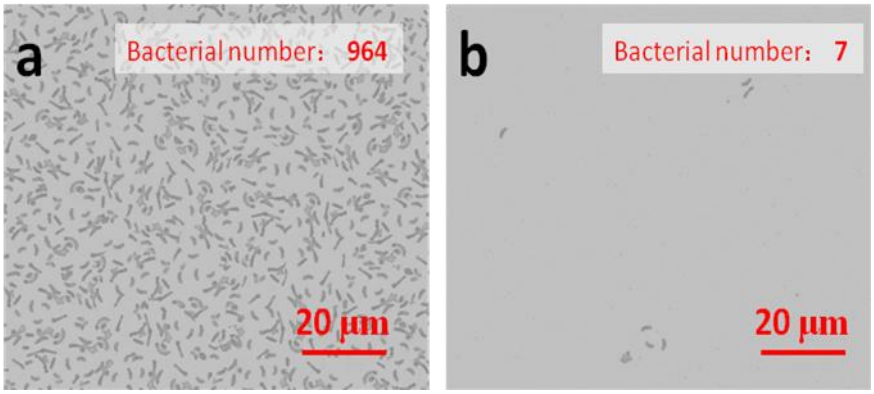

Figure S2 The bacterial number of *Helicobacter pylori* before (a) and after (b) cleaned by AFF.

Bacterial strain	Bacterial number before treatment	Bacterial number after treatment	Clearance rate
H. pylori No.1	964	7	99.3%
H. pylori No.2	772	59	92.3%
H. pylori No.3	563	1	99.8%
H. pylori No.4	1233	62	95.0%
H. pylori No.5	621	24	96.1%
E.coli No.1	823	15	98.2%
E.coli No.2	996	21	97.9%
E.coli No.3	787	13	98.3%
E.coli No.4	815	37	95.5%
S. aureus No.1	677	31	95.4%
S. aureus No.2	1021	56	94.5%
S. aureus No.3	820	44	94.6%

Table S1 The bacterial number before and after treated by AFF.

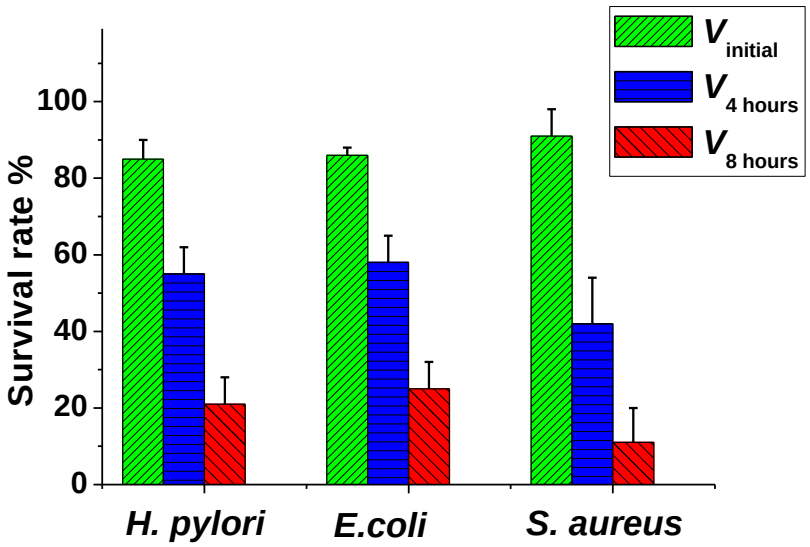

Figure S3 The survival of bacteria before ($V_{initial}$) and after trpped by AFF for 4 ($V_{4\ hours}$) and 8 hours($V_{8\ hours}$). The data are the mean of at least three independent experiments ± standard deviations.

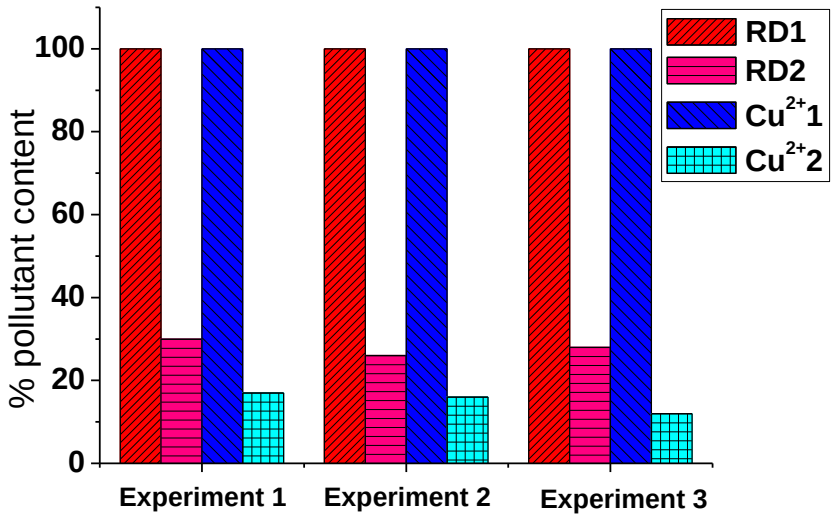

Figure S4 The contents of Congo red dye (RD2) and $CuSO_4$ ($Cu^{2+}2$) after treated by AFF for 48 hours.The experiments were repeated for three times. For the ease of comparison, the contents of the Congo red dye (RD1) and $CuSO_4$ ($Cu^{2+}1$) before treated by AFF was designated as 100% scale.

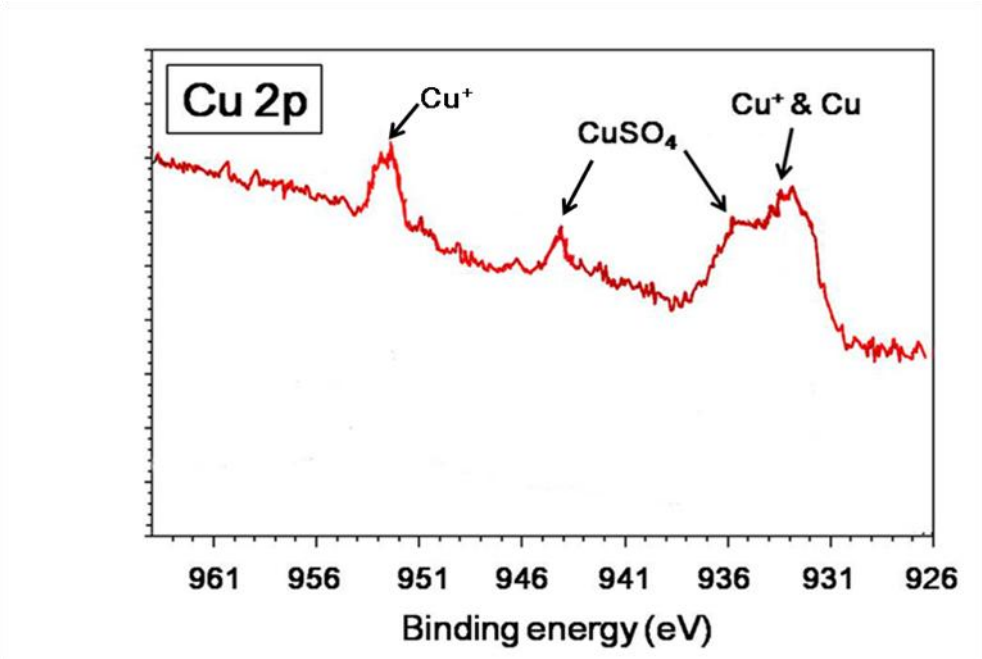

Figure S5 The XPS study of the AFF after $CuSO_4$ (Cu^{2+}) clearance.

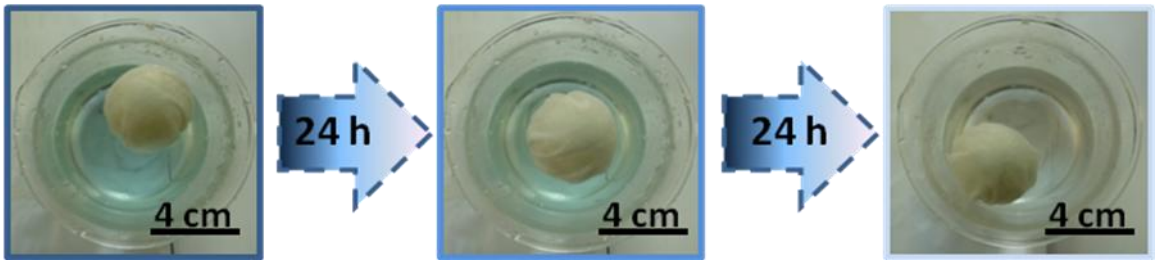

Figure S6 One practical example of the industrial electroplating waste water treatment by using the packaged AFF.