



### Additional file 3

Analyses of property of the OIPKS product. (A)(B) Imaging analyses of the chimeric experiment. (A) All 110 OVs of 55 transplanted animals are observed and sorted to 9 categories depending on their percentage of *wt* cells in their OV epithelium (Note a chimeric fish has two OVs). The histogram shows that a very small number of *wt* cells can rescue otolith formation. (B) The same sample set is also analyzed to assess the localization of *wt* cells within the OV. 'medial' means *wt* cells located around medial wall of the OV region where *olpks* gene is normally expressed in *wt* animal; 'medial and other' includes medial and any other epithelial region; 'other' includes *wt* cells existing anywhere in the epithelium except the medial wall. (C) Western blot of OIPKS protein produced by *A. oryzae*. To verify expression of OIPKS in heterologous expression experiment, purified protein from a transformant is analyzed by anti-OIPKS antiserum. The OIPKS protein gave a protein band at a position of ca. 210 kDa on SDS-PAGE. However, some bands (degrade proteins) were also found in this experiment.