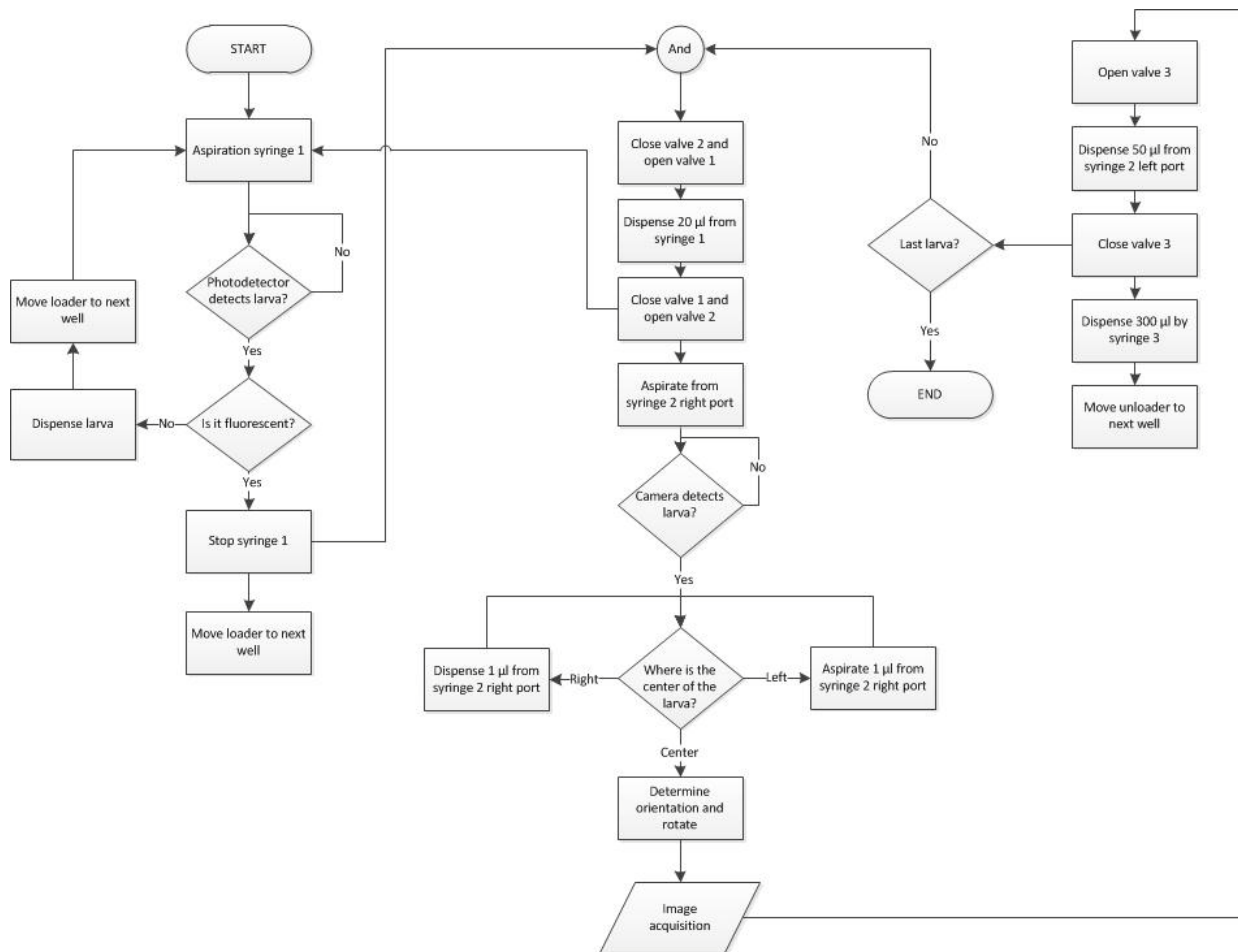


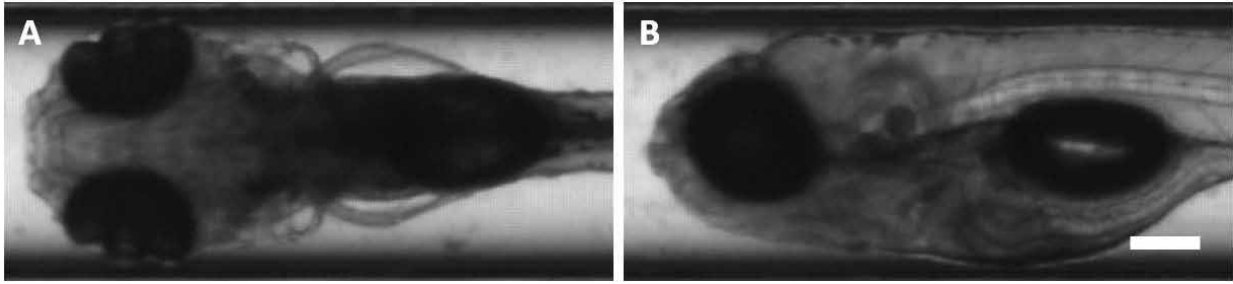
## SUPPLEMENTARY INFORMATION

### Algorithm and Software for Operation Sequence

The detailed algorithm for the operation sequence of the system is shown in the flowchart of the **Supplementary Figure 1**. The control software is written in Matlab. The most recent version of the software compatible with the most recent operating system upgrades is available upon request from the authors (MF Yanik, [yanik@mit.edu](mailto:yanik@mit.edu)).



**Supplementary Figure 1:** Flowchart showing the algorithm for the operation sequence of the system. Rounded rectangles show the initialization and endpoints of the flow chart. Square boxes show the flow processing steps. Rhombus show conditionals or decision processes. Parallelograms show outputs (image acquisition). Circles represent waiting points, where both inputs have to be reached before proceeding to the next step. The left section of the flow chart represent the loading subprocesses, the middle section the positioning and imaging subprocesses and the right section shows the unloading subprocess.



**Supplementary Figure 2:** Templates for automated rotation. (A) Dorsal and (B) lateral templates of a 5-dpf zebrafish used to compute the correlation data shown in **Figure 4c**.