CANSCollect

Low-cost fraction collector device for parallel sampling.

Fraction collectors are common and essential equipment in most laboratories of biochemistry, pharmacology, natural products and drug discovery. However, they result of limited versatility the moment one need tailoring them for our specific necessities (i.e. change the size of collecting tubes, the sequence of tube exchange or simultaneous collection). In addition, the price of these systems results expensive, especially for small laboratories or to those placed in developing countries. The arrival of 3D printers and cheap popular devices for electronic control are changing the way for designing and making laboratory equipment. We have built a fraction collector and provide all of the elements (3D files, spares description, electronics and software) required for making a fraction collector capable to admit almost any kind of rack and tubes, which also allows complex protocols adapted to liquid chromatography and for parallel collections from cell or organ perfused. The total cost of the whole device would be around $/€100.

I have developed this system with Dr. David Díaz Martín (Ms in preparation)

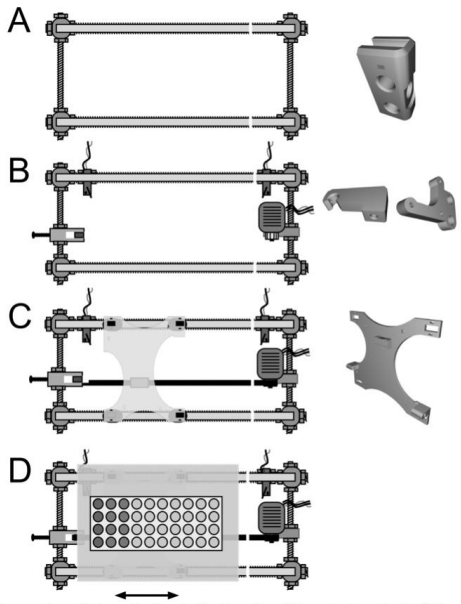

Figure 1. Upper view of the collector indicating the different steps for building. A, The 4 Prusa® corner pieces (displayed at the right) are used for mounting the frame. Two 10 mm Ø threated rods of 50 cm length are used to fix the longer axes using nuts and washers. Similarly, four 8 mm Ø threated rods of 20 cm length (2 on each side) are used for completing the frame. Finally, two rods (50 cm, 8 mm Ø) are fixed using plastic bands (not shown). **B,** The two end-stops are also fixed to one of the long threated rods by nuts and washers. Similarly the step motor and the belt tensor (not shown at right) are fixed to both 8 mm Ø threated rods using the motor holder. At the right it is shown one of the holders for end-stops and the motor holder. **C,** The carriage platform is fixed to the 4 bearings using plastic bands. The toothed belt is passed through the tensor and the step motor and fixed to the bottom part of the platform using the belt holder. **D,** the working platform is screwed to the carriage platform. This working surface has been designed to satisfy our own necessities, but can be tailored for accommodate almost any kind of tube racks.

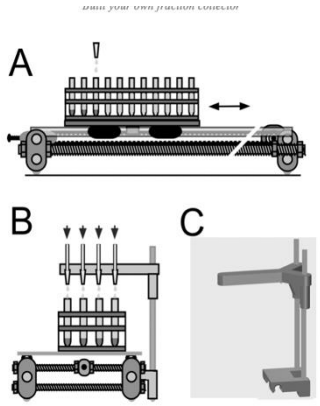

Figure 2. Side views of the collector. The tube rack is mounted onto a methacrylate flat surface; this means that it can accommodate any rack also including the use of a tray with ice for cooling collecting samples. This simple design allows multiple sample collection by placing parallel dropping system. The distance between tubes (and the intermediate points for non-collecting periods) are easily programed through the step motor motion. **A,** Right view of the system, showing the step motor the toothed belt and its tensor. **B,** Front view, showing the handler for 4 parallel droppers. Note the situation of the self-adhesive rubber feet tall bumpers under the frame and the stand handler **C,** Drawing showing the stand for the dropping system, which allow to place multiple dropping elements. Two rods of 25 cm length, 6 mm Ø are used for setting the height of drippers. All STL files for printing are supplied as Supplemental Material.

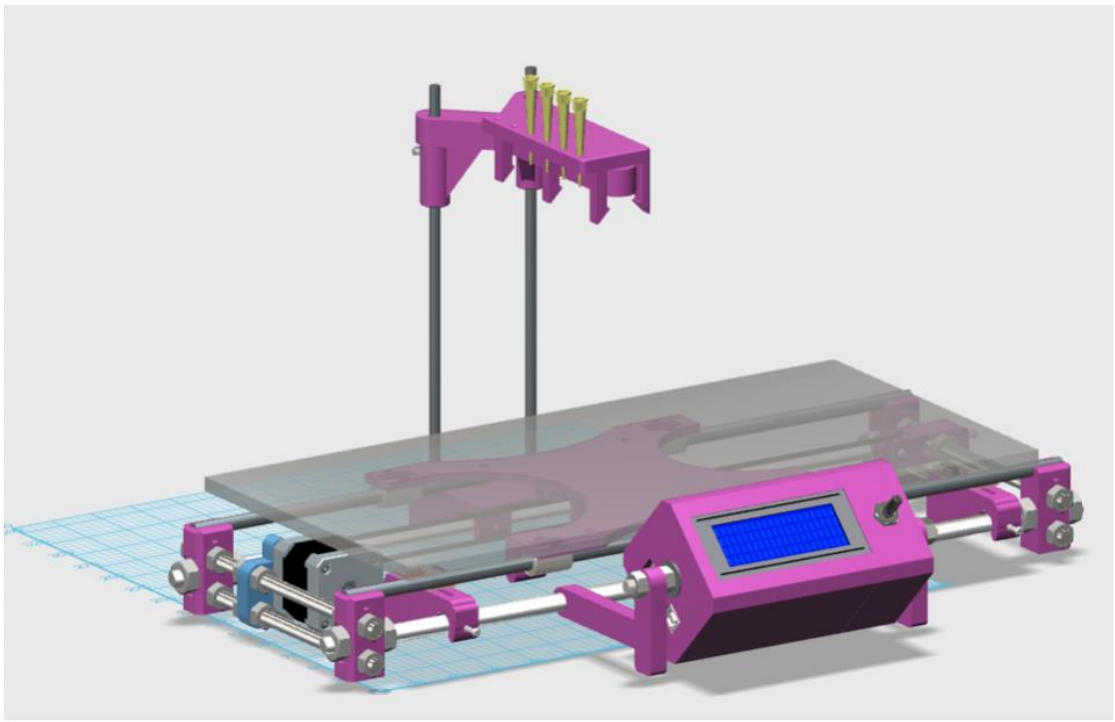

Figure 3. Recreation of the whole fraction collector system. All pieces are real files whose description and STL files are supplied. In front we have placed the control unit containing the Arduino controllers and screen. The system can be also controlled by a computer through an USB connector. Perfusion system is omitted.