Single Layer Microfluidic Device For Three Dimensional Hydrodynamic Focusing of a Sample Fluid Using A Sheath Fluid And Method Of Fabricating The Same

Single layer m
icrofluidic device for three dimensional hydrodynamic focusing of a sample fluid
using a sheath fluid and method of fabricating the same
The
micro fluidic device
(1)
consists of a sheath fluid microchannel
(4)
having a straight inlet
portion
(6)
and a straight outlet portion
(7)
delineated by an obtuse angle curved portion
(8)
bulging out in one direction in the horizontal plane followed by an acute angle curved
portion
(9)
bulging out in the opposite dir
ection in the same horizontal plane
. T
he outer radius of
curvature of each of the curved portions
is
twice that of the inner radius of curvature of the
respective curved portions
. T
he inlet portion ha
s
a sheath fluid inlet port
(11)
at the inner end
t
hereof coaxially with the inlet portion and registering with the size of the inlet portion
and
the
outlet portion ha
s
a fluid outlet port
(12)
at the outer end thereof coaxially with the outlet
portion and registering with the size of the outlet porti
on

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The device further consists of a sample fluid microchannel having a straight portion having a sample fluid inlet port and a sample fluid outlet port at the inner and outer ends of the straight portion, respectively and coaxially with the straight portion and registering with the size of the straight portion. The straight portion is connected across the inlet portion of the sheath fluid microchannel at the sample fluid outlet port thereof perpendicular to the inlet portion. The device is cast in a single layer with a polymer substrate in a mold followed by curing the device.

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