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E-mail: jzus@zju.edu.cn

Supplementary materials for

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Table S1 Detailed parameters of the flow system channels and the corresponding microrobots used, and the actuation and tracking methods

System	Channel length	Channel size	Flow rate	Robot shape	Robot size	Actuation and tracking method
Lab flow system: Poiseuille	5.5 cm	100 μm cylindrical channel	1.05 m/s	Sphere	10.82 μm particles	MRI (Mathieu and Martel, 2006)
	2 cm	2.5 mm in width, 0.3 mm in height	12.2, 6.1 mm/s (in main and outlet branch)	Sphere	11 μm in diameter	MRI (Mathieu and Martel, 2010)
	10 cm	1.6–4.8 mm in diameter	0–75 μL/min (at an interval of 25 μL/min)	Helical	D_{head}=880 μm, wavelength=1 mm, L_{tail}=4 or 6 mm, L_{head}, D_{tail} NM	Rotating magnetic field (Acemoglu and Yesilyurt, 2015)
	NM	150, 300 μm in diameter	0.2 mm/s	Sphere	2.9 μm (particle), 15, 40 μm (cluster)	Rotating magnetic field (Ahmed et al., 2021)
Lab flow system: pulsatile	NM	7 mm in diameter	39–87 cm/s	Cylinder	1 mm in diameter, 10 mm in length	Electro-magnetic system (Choi et al., 2010b)
	NM	9.82 mm in diameter	6×10^{-6}, 7.1×10^{-6} m^3/s	Sphere	1500 μm in diameter	MRI (Tamaz et al., 2008)
	NM	3 mm in diameter	25mm/s	Sphere	250 μm	Magnetic field gradient (Arcese et al., 2011)
Artificial blood system	12 mm	75 μm in height, 3 mm in width	5–20 μL/min for PBS, 1.12–12.26 mL/min for whole blood	Sphere	3, 7.8 μm in diameter	Rotating magnetic field (Alapan et al., 2020)
	1 mm	0.1 mm in thickness, 4 mm in width	0.167 mm/s	Sperm like (cap diameter + sperm length > 60 μm)	13 μm (diameter of the cap)	Permanent magnetic field (Xu et al., 2020)
Ex vivo system	NM	2.6 mm in diameter	30 mm/s	Sphere	NM	Cylinder permanent magnet (Wang et al., 2021)
In vivo system	NM	NM	NM	Helical	8, 16 μm in length	Rotating magnetic field (Servant et al., 2015)
	NM	NM	NM	Porous sphere	70, 90 μm in diameter	Magnetic field gradient (Li et al., 2018)
	NM	Diameter of carotid artery of a living swine	Flow rate of carotid artery of a living swine	Sphere	1.5 mm in diameter	Magnetic field gradient (Martel et al., 2007)
	NM	10–15 mm in diameter	50–60 heart beats/min	Cylinder	1 mm in diameter, 10 mm in length	Uniform magnetic field and magnetic field gradient (Choi et al., 2010a)
	5 mm	0.2 mm in width	100, 400, 700 μm/s	NM	NM	Rotating magnetic field (Zhang et al., 2021)

NM: not mentioned

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