Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary data

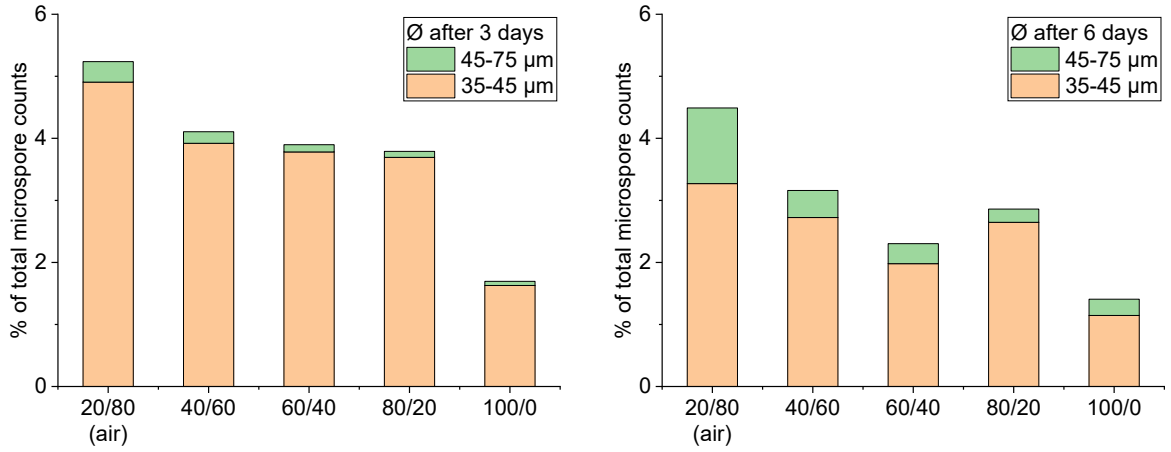

Fig. S1. Influence of different oxygen atmospheres on the growth behavior of microspores of *Brassica napus.* Microspores in microfluidic segments were incubated in PTFE tubes (ID 0.5 mm/AD 1.0 mm) under atmospheres with different oxygen contents. At a density of approximately 50 microspores/droplet, the size distribution of microspores in the total microspore number were determined after 3 (left) or 6 days (right). Lower selection range 35-45 µm (orange, first division steps), upper selection range 45-75 µm (green, further division steps until largest detected microspore); X-axis: O_2/N_2 in percent.

The graphs show a section of the overall size distribution of microspores incubated in 120 nL microfluidic segments after 3 days (left) and after 6 days (right). The X axis shows the five different artificially generated atmospheres with the ratio of oxygen to nitrogen and the Y axis shows the percentage of microspores larger than 35 µm of the total microspore content of the respective batch. After 3 days, a clear, continuous trend can already be seen in the diagram. The highest proportion of microspores larger than 35 µm in the total microspore count was reached at around 5.2% under normal air conditions. This is followed by a downward trend from 40% to 100% oxygen with proportions of 4.1, 3.9, 3.8 and 1.7%. From the third to the sixth day of cultivation, the percentage of very large microspores (>45 µm) increases, and the percentage was by far the largest at 20% oxygen. The observed trend also continues in the obtained embryo ratios, which are shown in Table S1.

Tab. S1: Embryo rate under different oxygen atmospheres. Shown are five different ratios of O_2/N_2, the corresponding embryo numbers with the respective total number of microspores of *Brassica napus* and the embryo rate calculated in percent.

ratio O_2/N_2	number of embryos (total number of microspores)	embryo rate
20/80 (Luft)	4 (6990)	0,057 %
40/60	1 (4821)	0,021 %
60/40		
80/20	no embryos	
100/0		

The results clearly show that the microspores require an oxygen content of about 20 %, as found in the ambient air, for the best development inside droplets. This in turn means that the PTFE tubing used here has sufficient gas permeability.