Electronic Supplementary Material (ESI) for Lab on a Chip
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Single-step design of hydrogel-based microfluidic assays for rapid diagnostics

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Supplemental Information:

Table S1: Hydrogel contact angle measurements on glass and photoresist surface (Ordyl SY300). Percentage values refer to PEG-DA 700 precursor concentration in water.

Precursor concentration	0%	20%	40%	60%	80%
Contact angle glass	11.5°	14.5°	20°	35°	38°
Contact angle Ordyl	68°	47°	40°	37°	27°

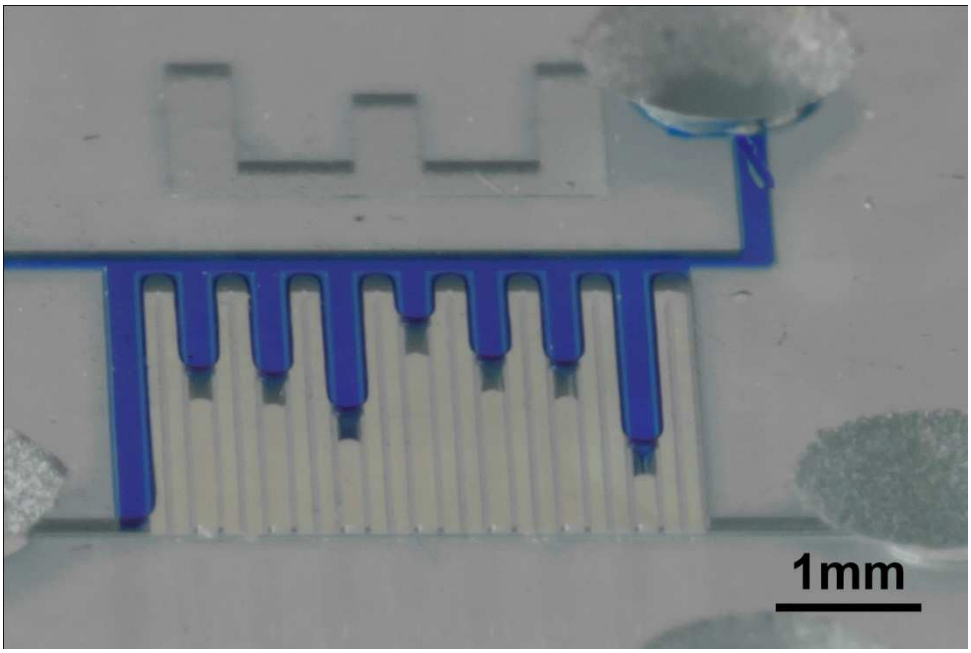

Fig S1: Advancing fluid menisci pinned to the guiding structures, allowing selective and well defined structuring of gel in the micrometer range for fast reagent interaction. Gel finger width: 250µm. Independent on channel height, guiding structures of ≥ 60 % the channel have shown reliable performance for different hydrogel solutions (tested from 65 µm to 150 µm total height). The chamber height is limited by the maximum aspect ratio of the resist material (Ordyl ~2.5h/w).

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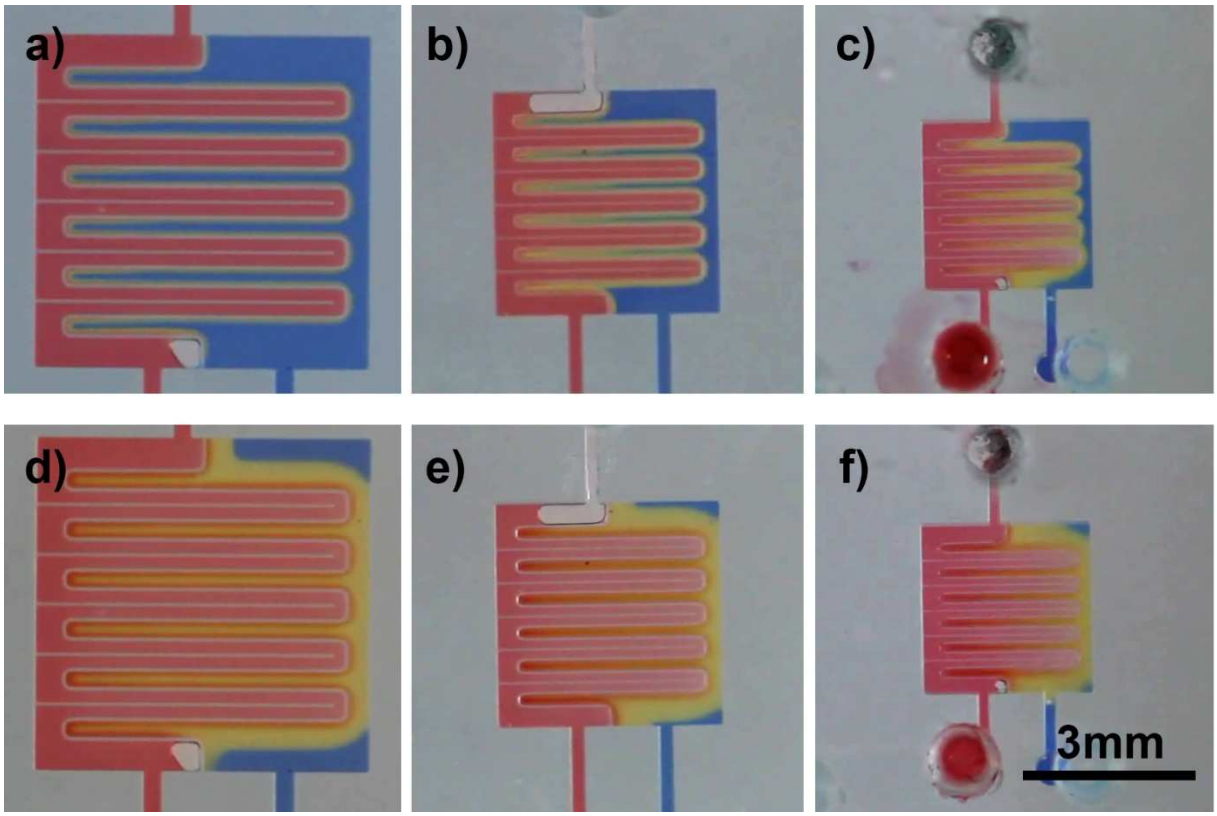

Fig S2: Test structures showing the influence of the chip geometry on the reaction speed. **a-c)** Picture taken 3s after sample injection. **a)** 6 mm chamber 450 µm fingers. **b)** 4 mm chamber 300 µm fingers. **c)** 3 mm chamber 225 µm fingers. **d-f)** 2 min after sample injection. Both, the pH reaction as well as the red dye diffusion are considerably faster as the gel finger width decreases.

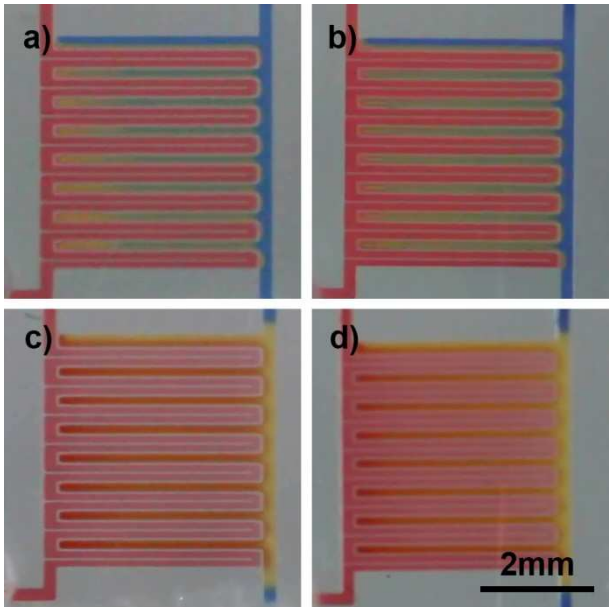

Fig S3: Reaction speed in dependence of relative guiding structure height. **a)** and **c)** 90 µm guiding structures, 20 µm gel interface (110µm total channel height). **b)** and **d)** 90 µm guiding structures, 60 µm gel interface (150 µm total channel height). **a)** and **b)** 3 s after sample injection. **c)** and **d)** 2 min after sample injection. As seen, the relative height of the guiding structure shows only minimal influence on the speed. As expected, the color intensity increases with total channel height.

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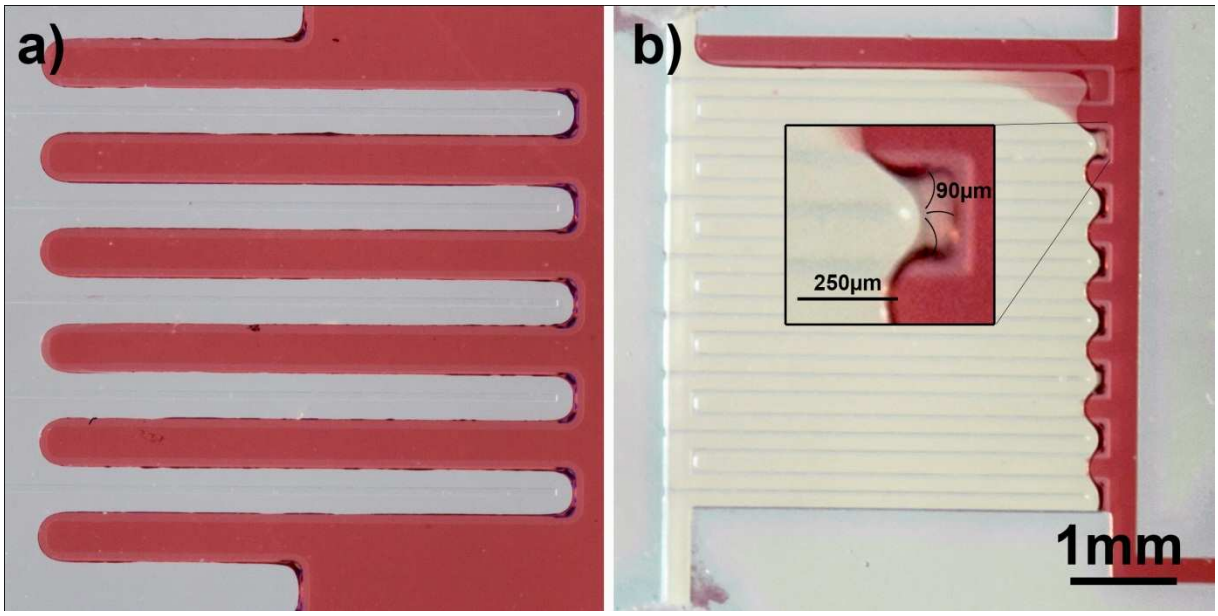

Fig S4: Influence of feature size on liquid guiding effect. Guiding structures are 60 µm high in 150 µm chambers. **a)** Large finger structures enable reliable filling. **b)** As the feature size approaches the vertical meniscus dimension, a critical corner prone to overflow is formed.