Supplementary Information

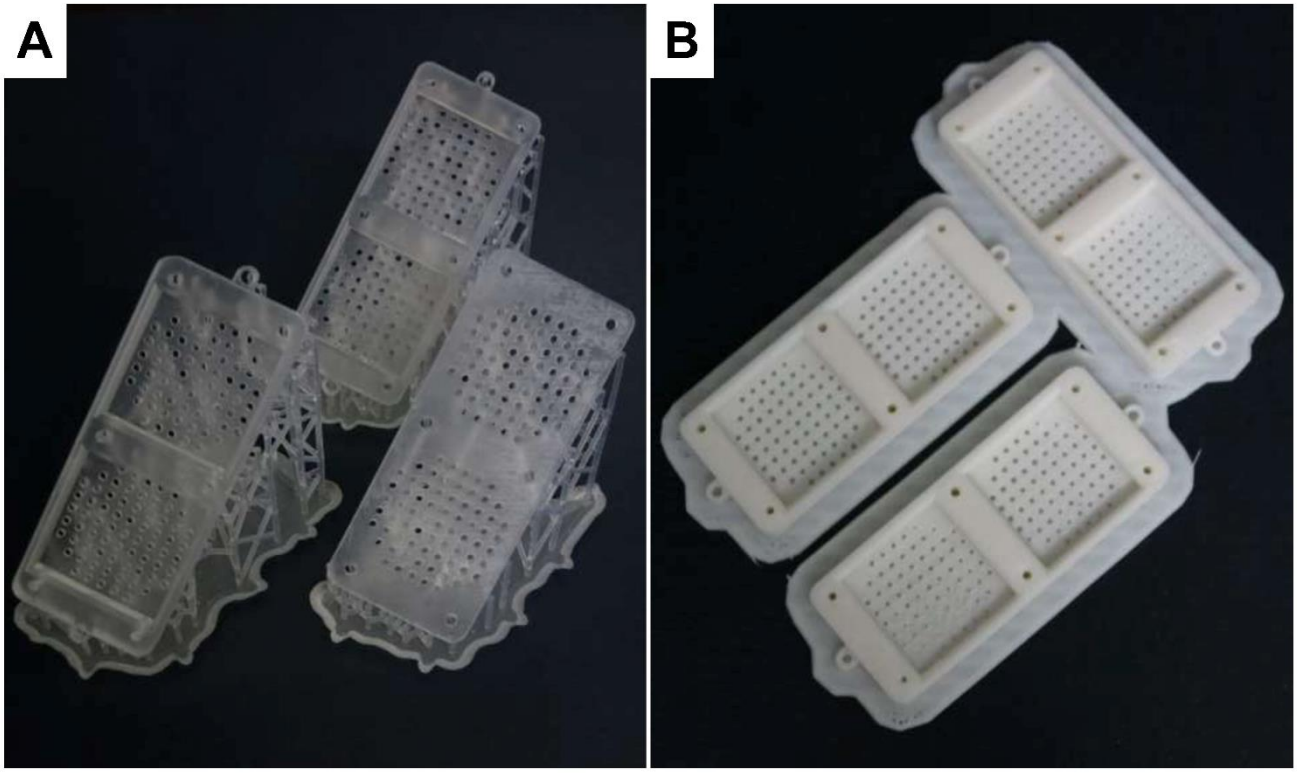

Figure S1. Prototype of the 3D-printed devices. **(A)** The inverted stereolithiographic SLS printing approach was used to fabricate the resin plates of the device using liquid photopolymeric epoxy resin that is cured and hardened directly while printing via ultraviolet (UV) laser. The plates were held up on supporting structures during the printing process. **(B)** The FDM printing approach was used to fabricate the PLA and ABS plates of the device using ready-to-use thermoplastic extruded through heating nozzles onto a heated platform. The plates were printed on flat scaffolds to reduce warping and platform adhesion.

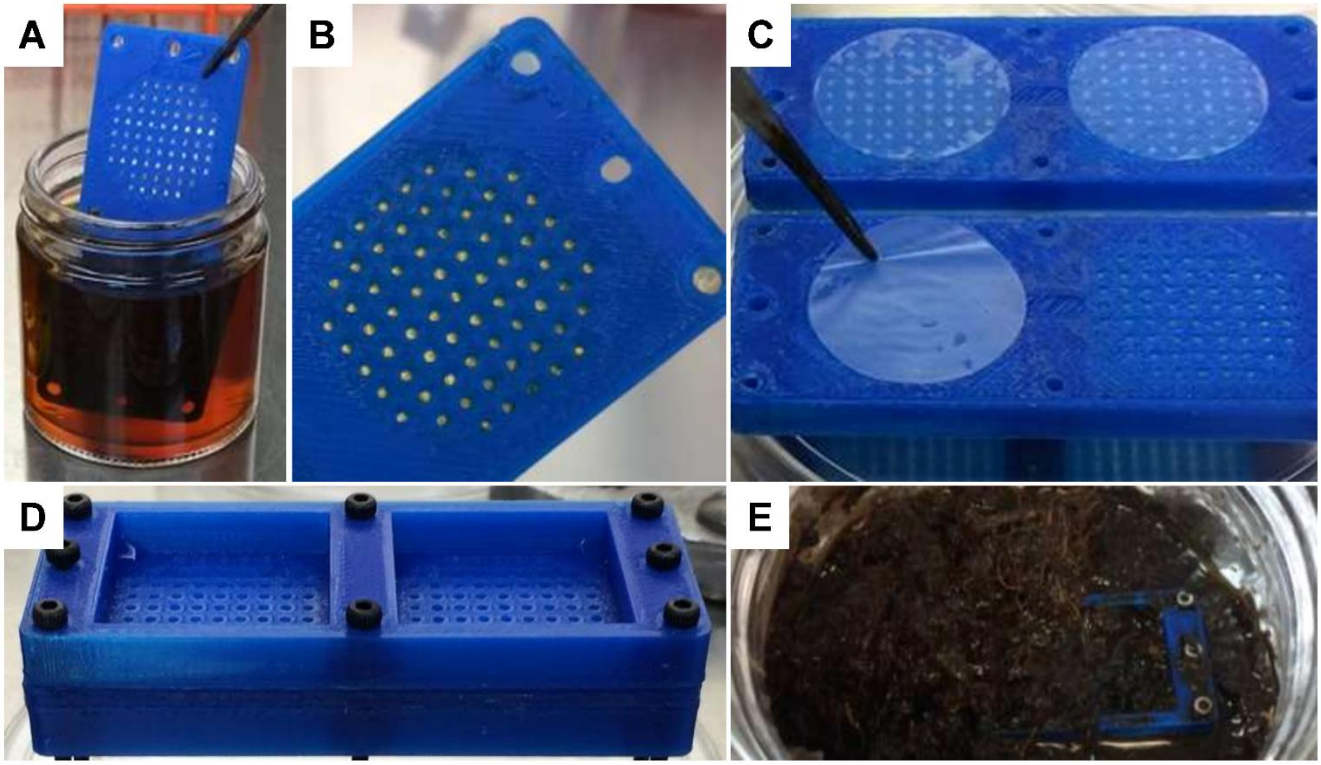

Figure S2. Inoculation and assembly of the iChip components. **(A)** The central plate is dipped into a molten TSA (10% wt/vol) at approximately 45°C with pre-adjusted microbial densities based off the substrate source. Dipping the central plate would entrap bacteria cells by an average of one cell per **(B)** through-hole within agar plugs. **(C)** Semi-permeable membranes with pore sizes of 0.22 µm are overlaid on both sides of the through-hole arrays prior to **(D)** assembly and subsequent **(E)** placement within the same substrate from which the inoculated microbes originate.

Table S1. The total relative abundance of all isolates in both cultivation approaches determined through Illumina MiSeq 16S rRNA sequencing and OTU assignment at the taxonomic levels of phyla and order. No significant differences were detected in terms of phyla abundances with regards to both approaches; however, at the level of taxonomic order, both cultivations as a collective yielded significantly different diversities (Wilcoxon signed rank test; $\rho < 0.05$). The pooled isolates from the iChip cultivation had a higher species richness (Alpha diversity) than that of the standard cultivation. Both indices of the beta diversity assessment further highlight a sizeable dissimilarity between the pooled isolates of both cultivation approaches.

Taxonomy Level	Relative Abundance (%)	
	iChip Cultivation	Standard Cultivation
Phyla		
Actinobacteria	5.6	1.4
Bacteroidetes	7.5	23.0
Firmicutes	19.0	15.0
Proteobacteria	68.0	60.0
Order		
Actinomycetales	5.6	1.4
Saprospirales	5.4	3.4
Flavobacteriales	0.7	7.4
Shingobacteriales	1.3	12.0
Bacillales	19.0	15.0
Lactobacillales	0.02	0.0
Caulobacterales	0.0	0.7
Rhizobiales	0.1	0.4
Sphingomonadales	6.2	1.2
Burkholderiales	29.0	17.0
Enterobacteriales	7.1	0.0
Pseudomonadales	8.2	3.0
Xanthomonadales	18.0	10.0
Alpha Diversity*		
Simpson's Index	0.966	0.898
Shannon Entropy	5.409	4.179
Beta Diversity*		
Bray-Curtis Dissimilarity	24.0%	
Weighted *UniFrac*	0.3	

* Computations of the alpha and beta diversity indices take into consideration, the combination of phylogenetic topology (evolutionary distances and abundance) as well as the collective OTUs and their relative abundance (not specified to a single taxonomic level) where applicable.