

Fig. 1

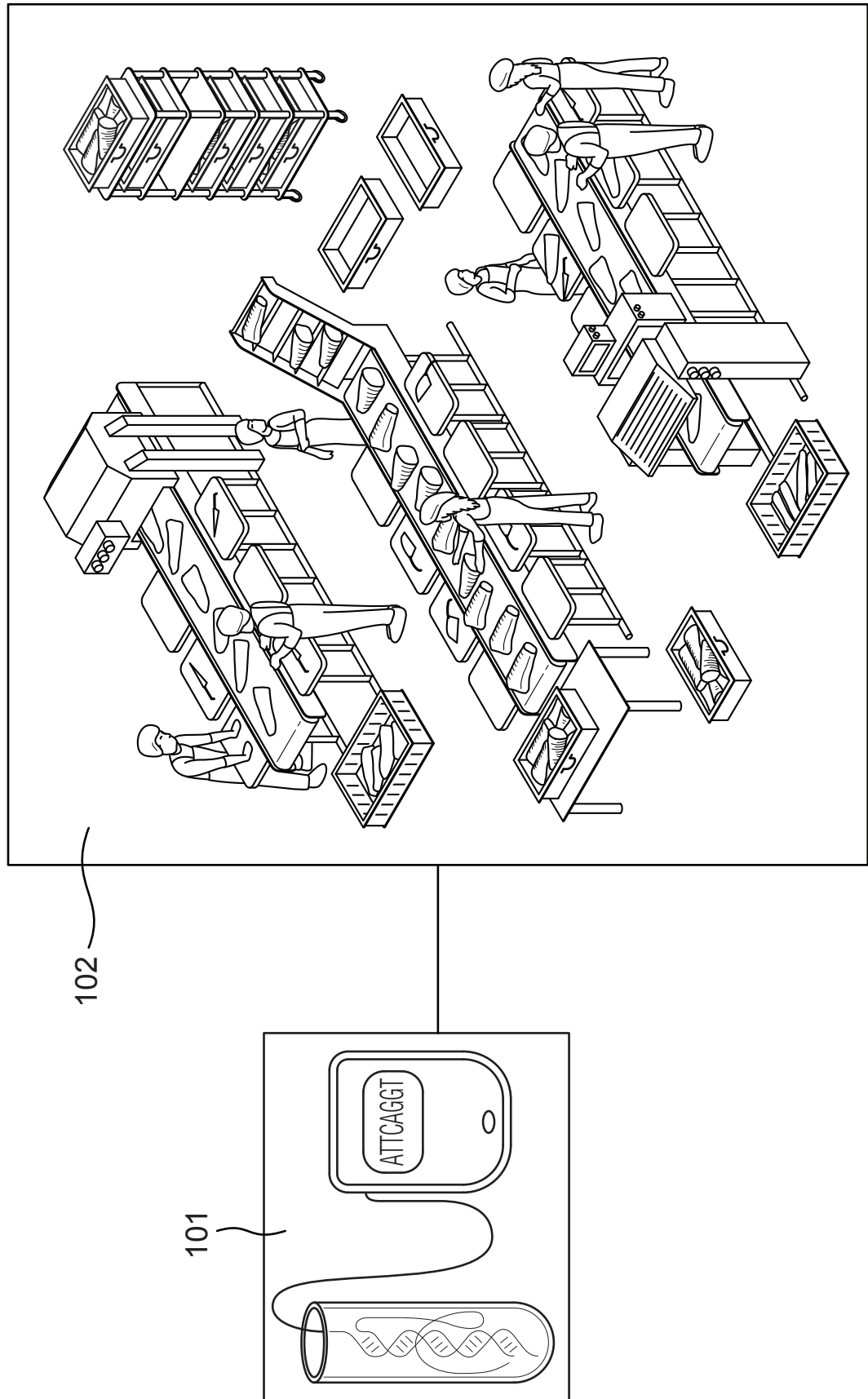


Fig. 2

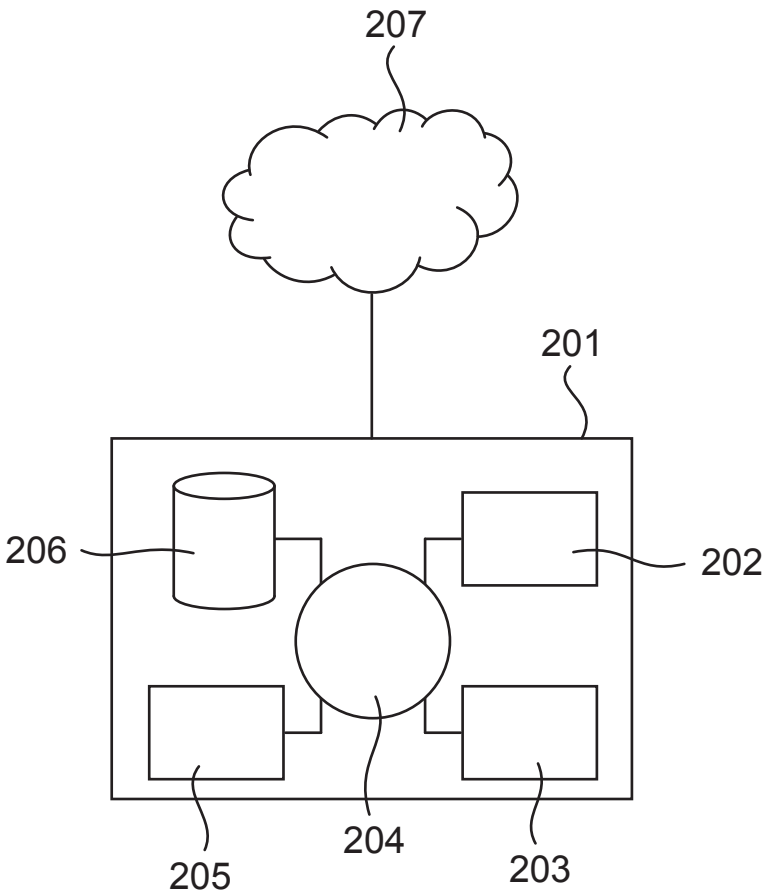


Fig. 3

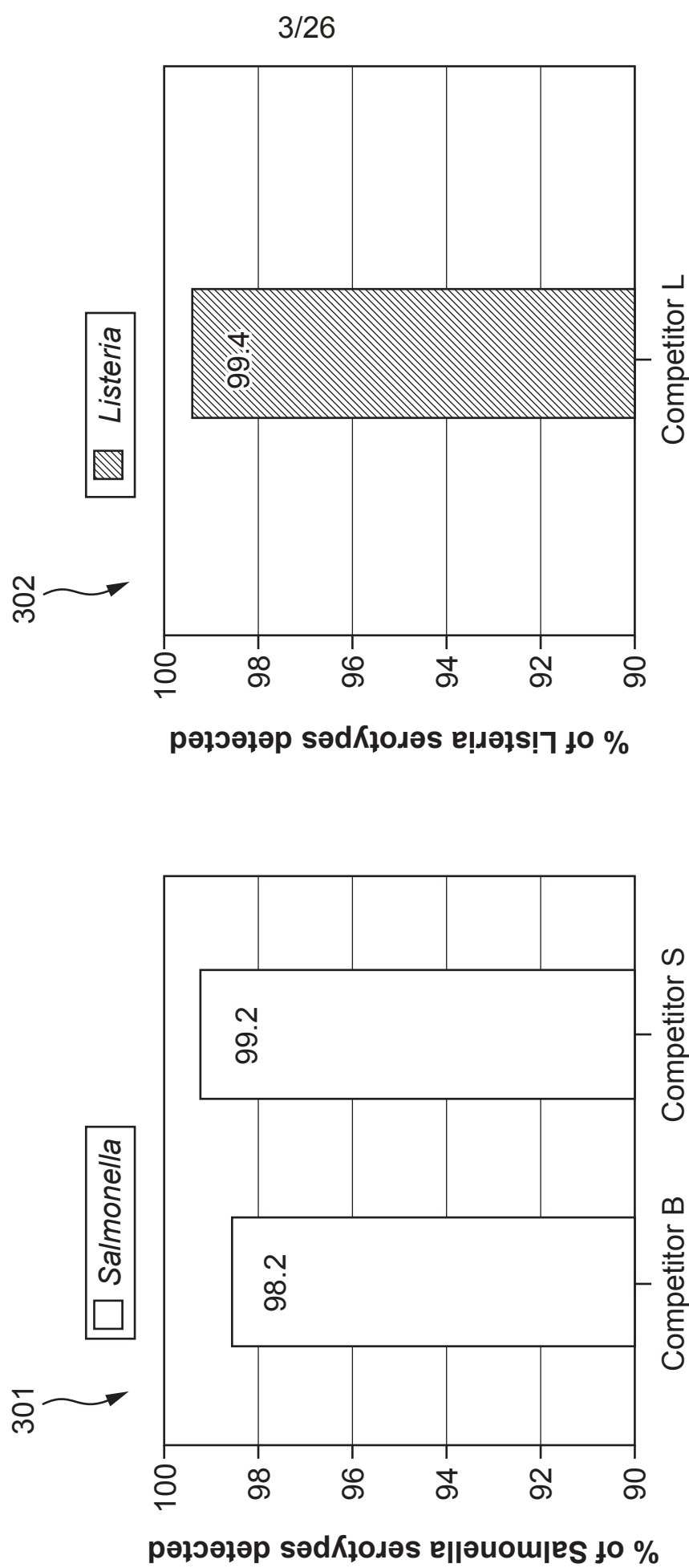
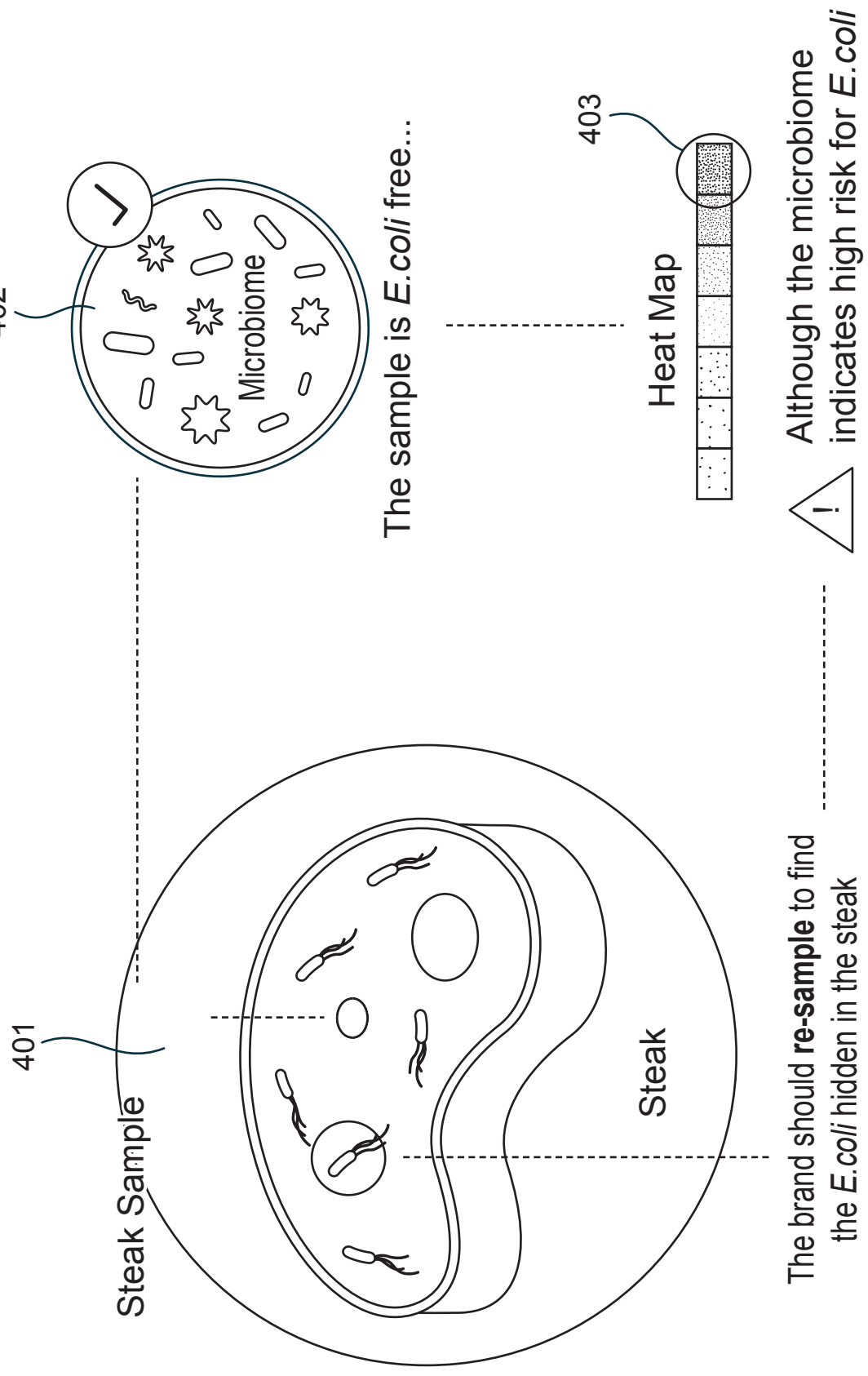


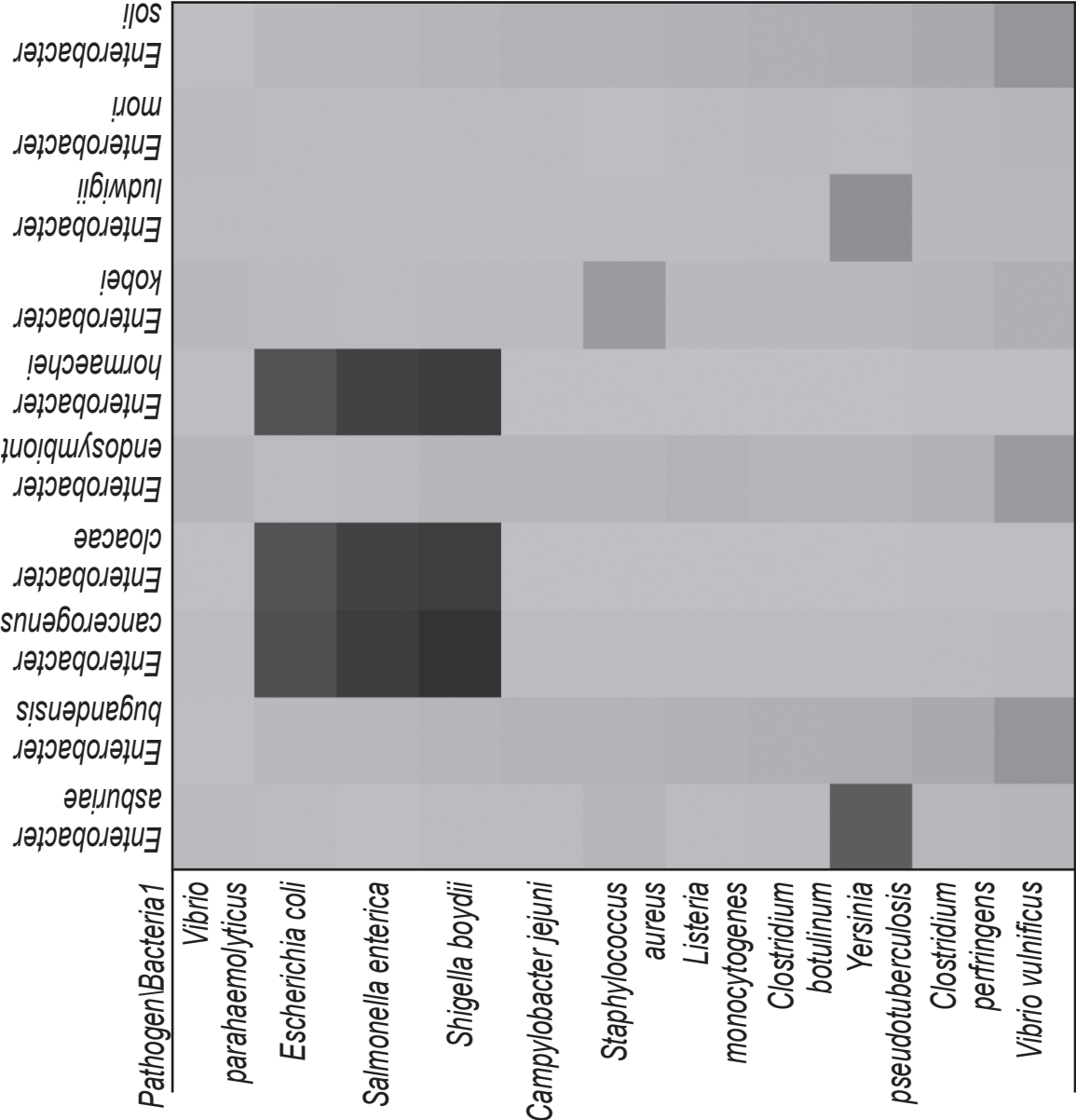
Fig. 4

Predictive Risk Assessment



Predictive Pathogen Detection Through Machine Learning

Fig. 5



Pathogens Can be Predicted from Microbiome

Model Performance

Pathogen	Accuracy	Precision
Salmonella enterica	96.16%	94.39%
Escherichia coli	97.48%	98.40%

Fig. 6

Beyond Safety:
Screening → Risk Assessment → Quality

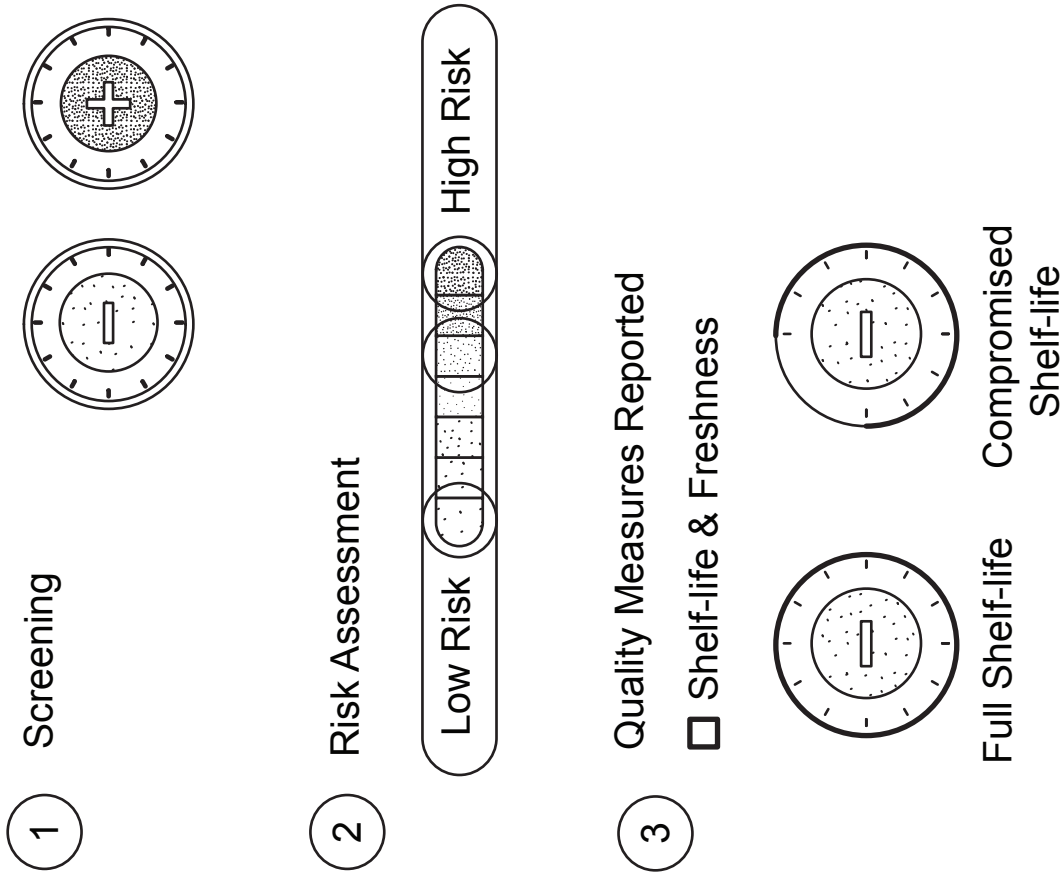


Fig. 7

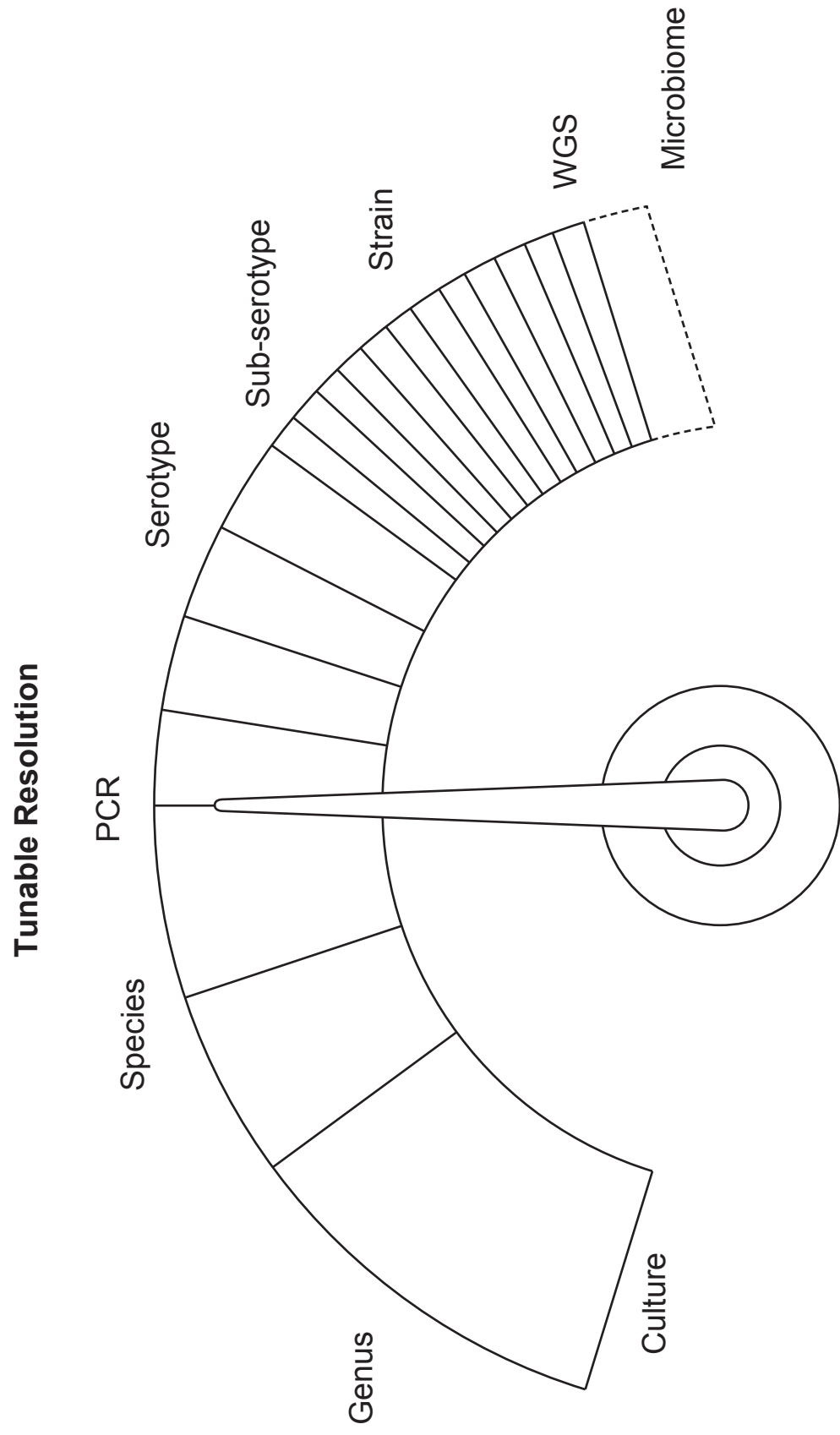


Fig. 8

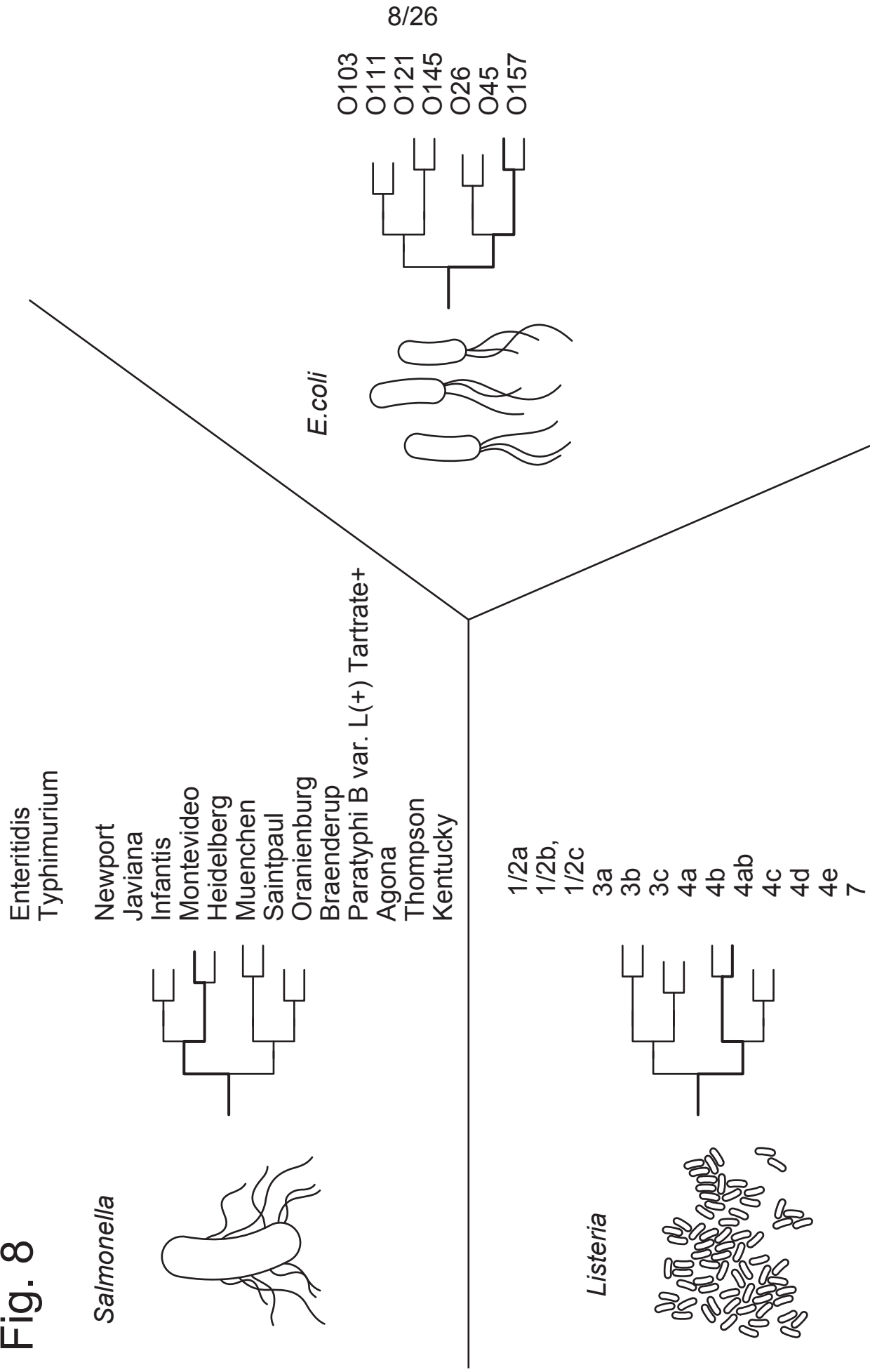


Fig. 9
Live Versus Dead

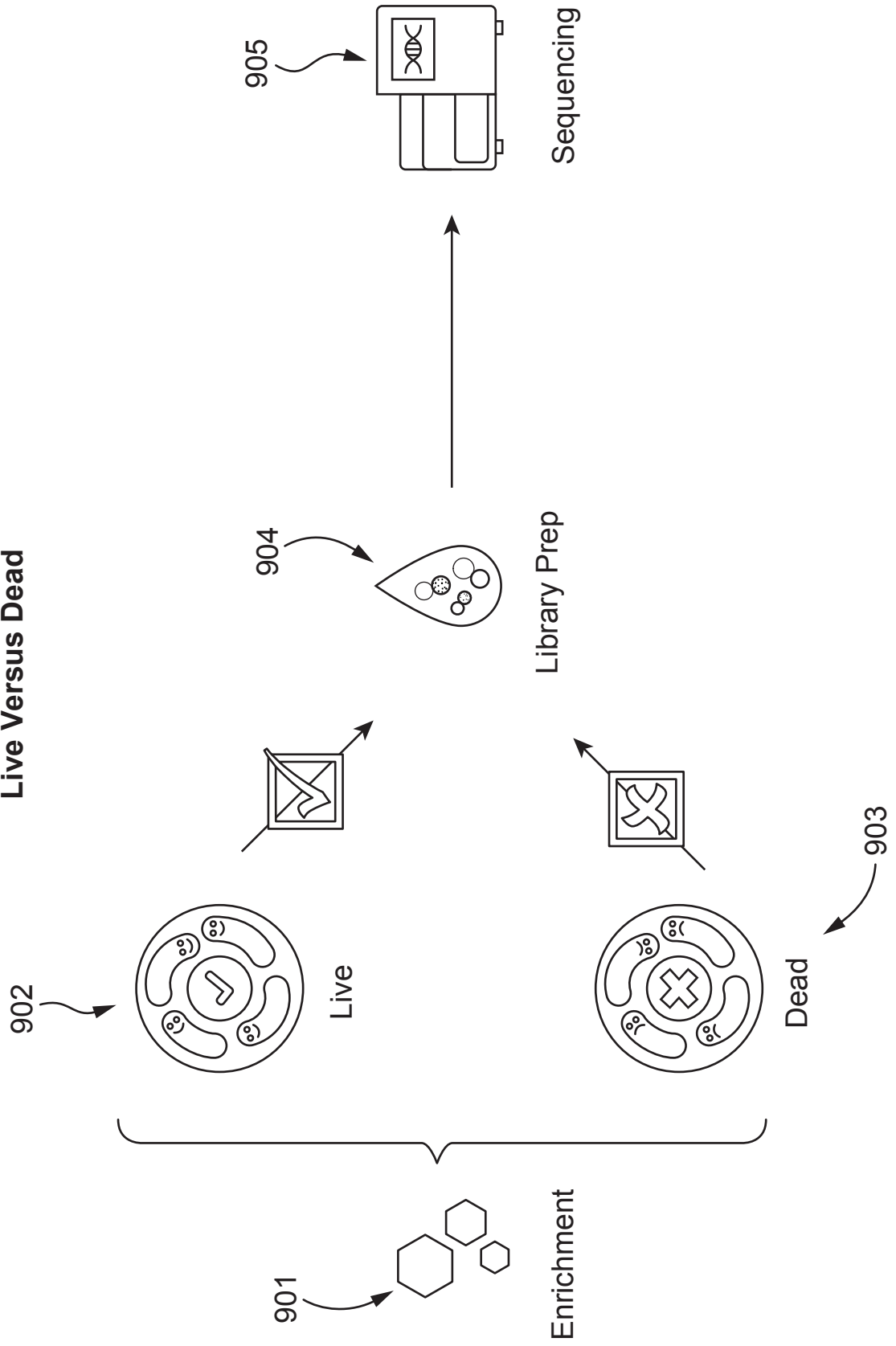


Fig. 10

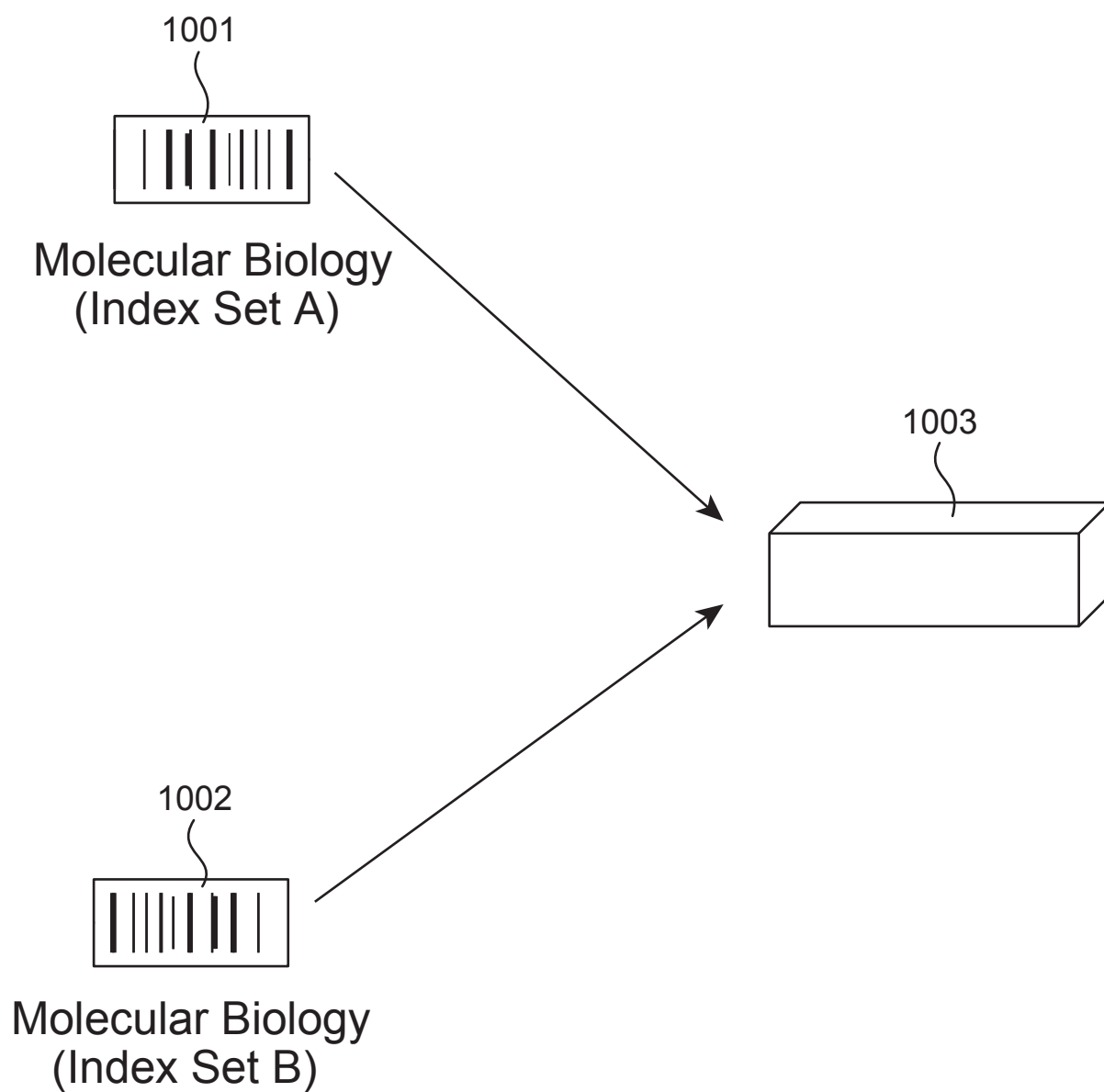
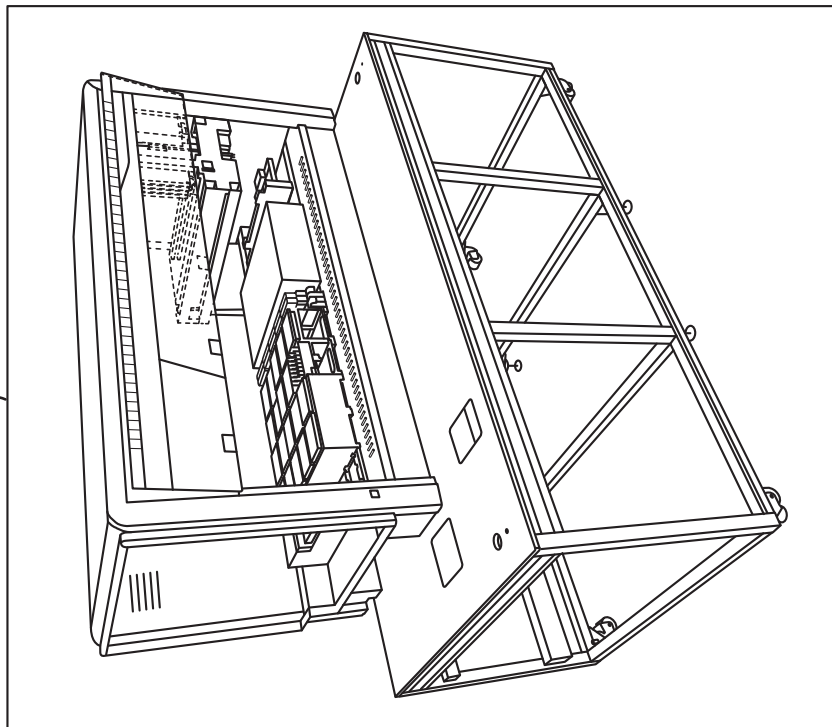


Fig. 11

1101



1102

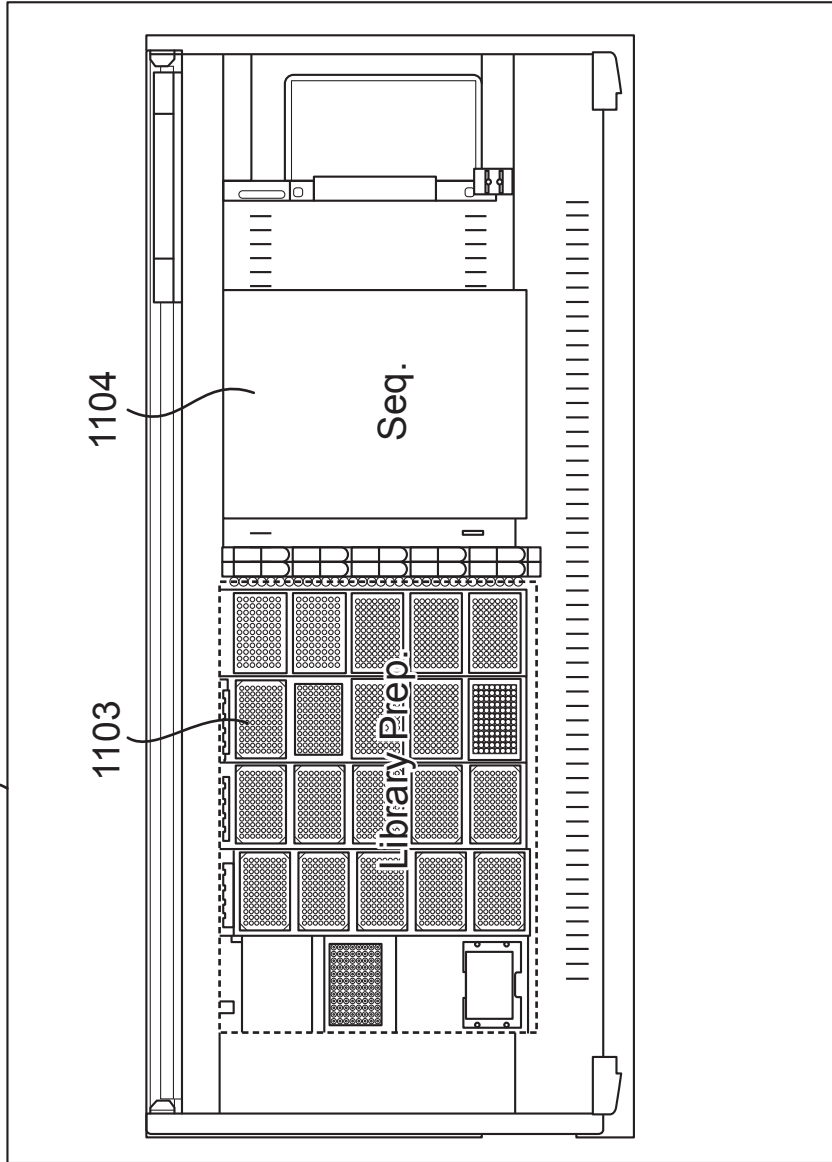


Fig. 12

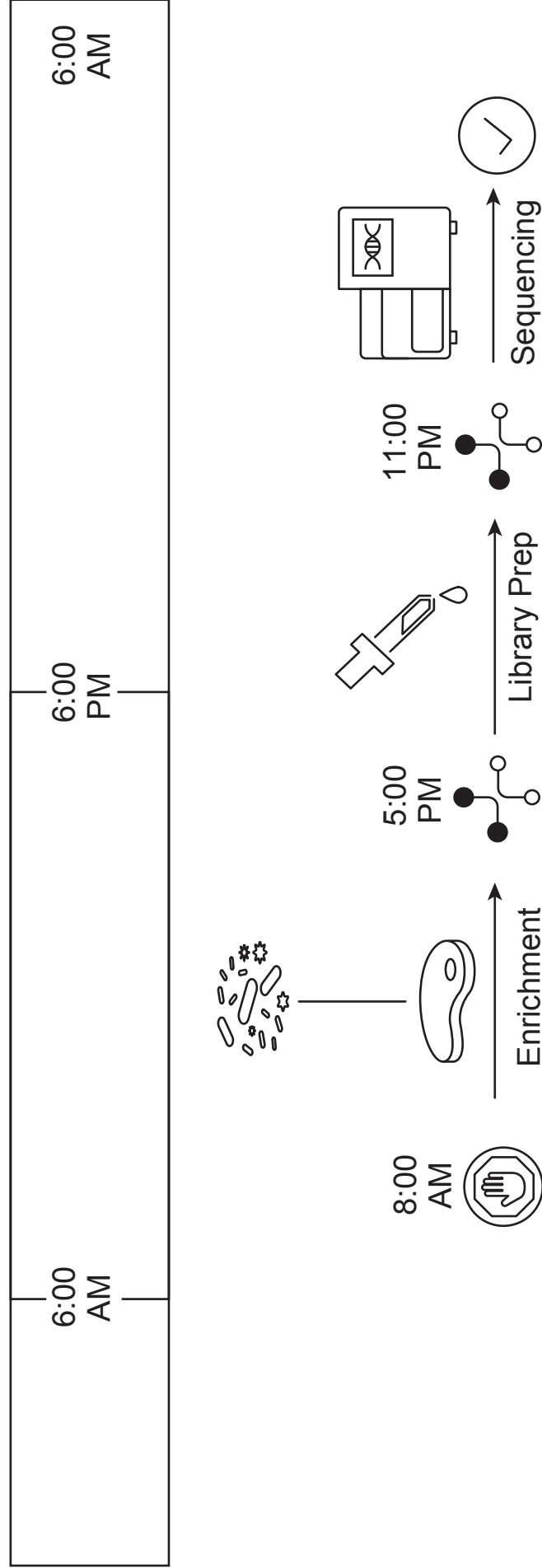


Fig. 13

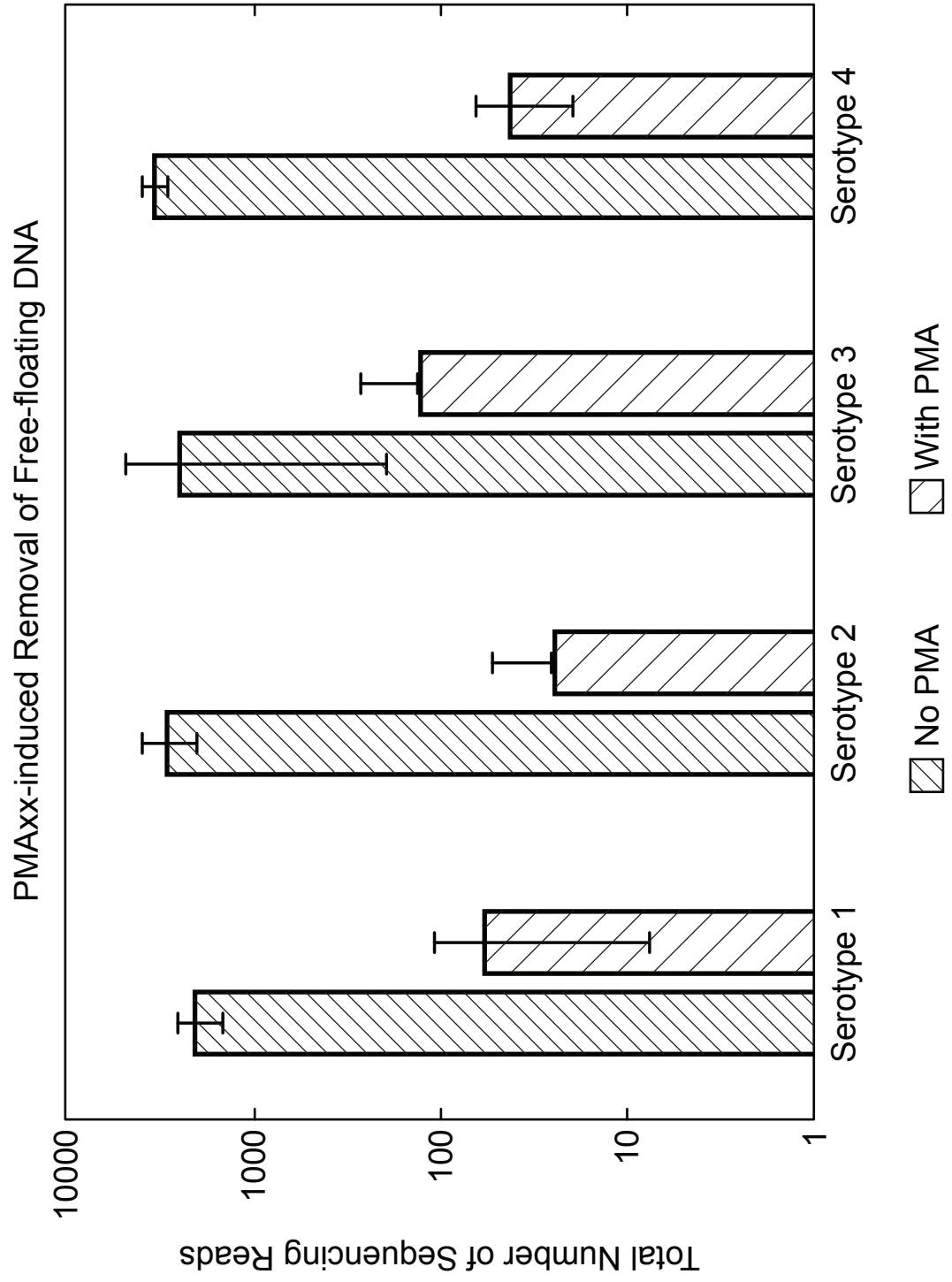


Fig. 14

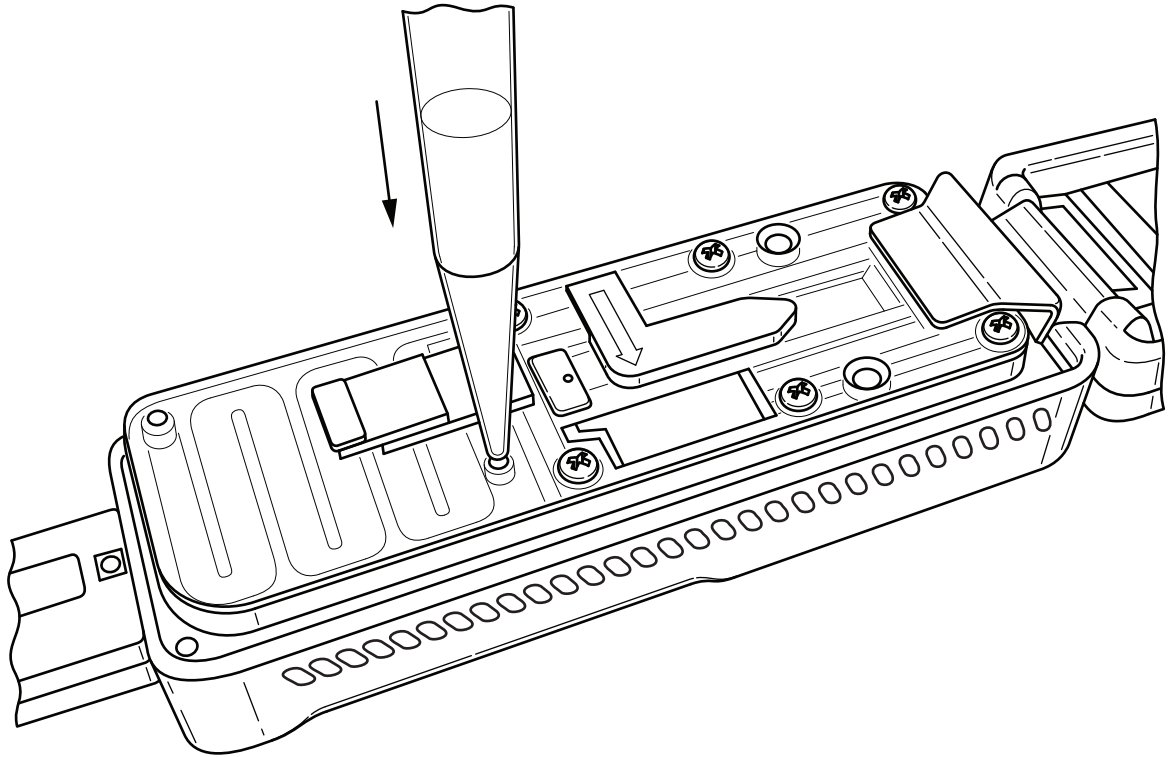


Fig. 15

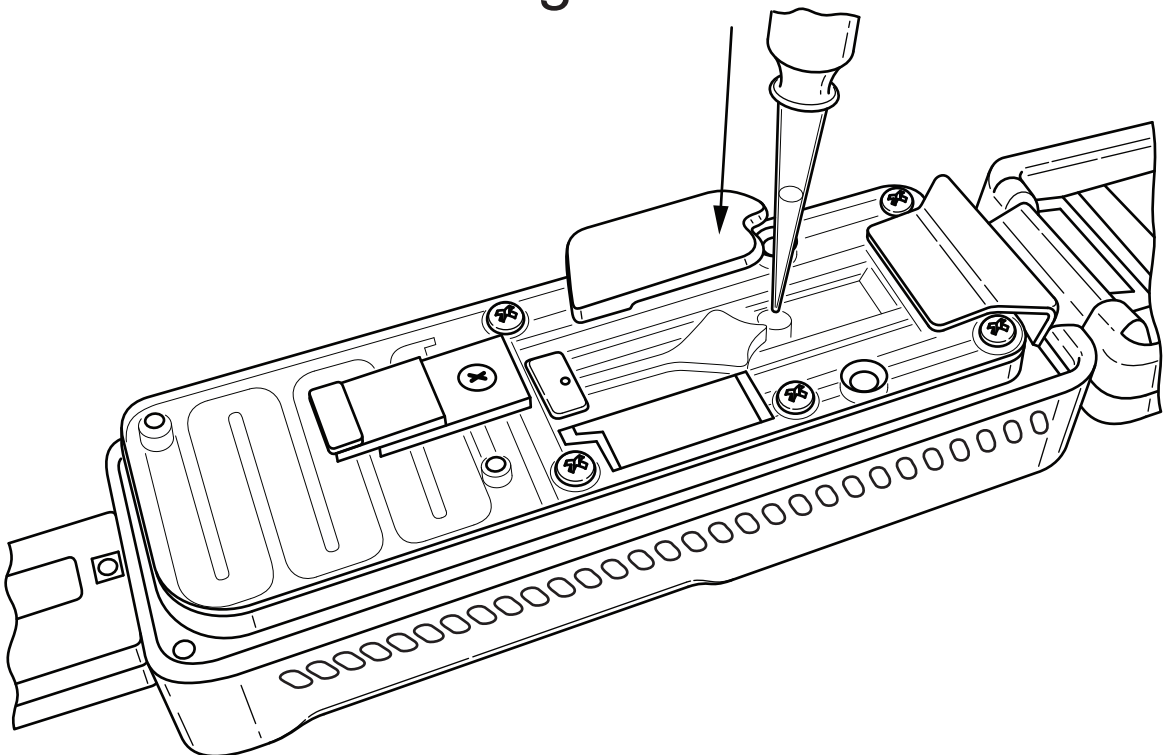


Fig. 16

Multi-Target Pathogens Same Sample

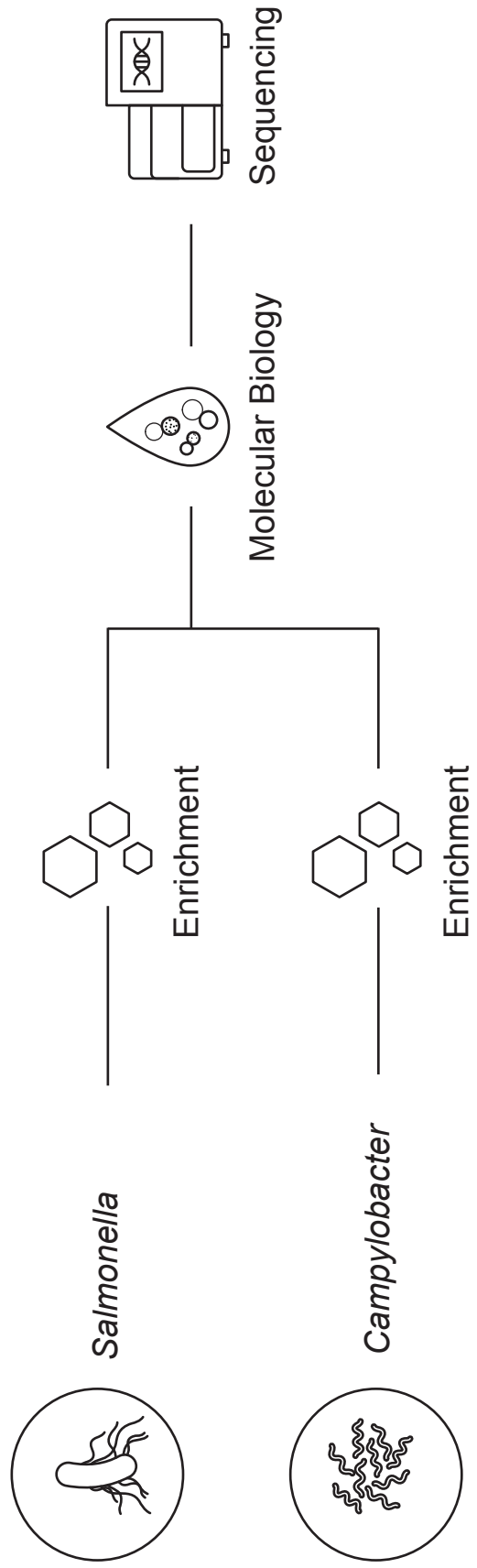
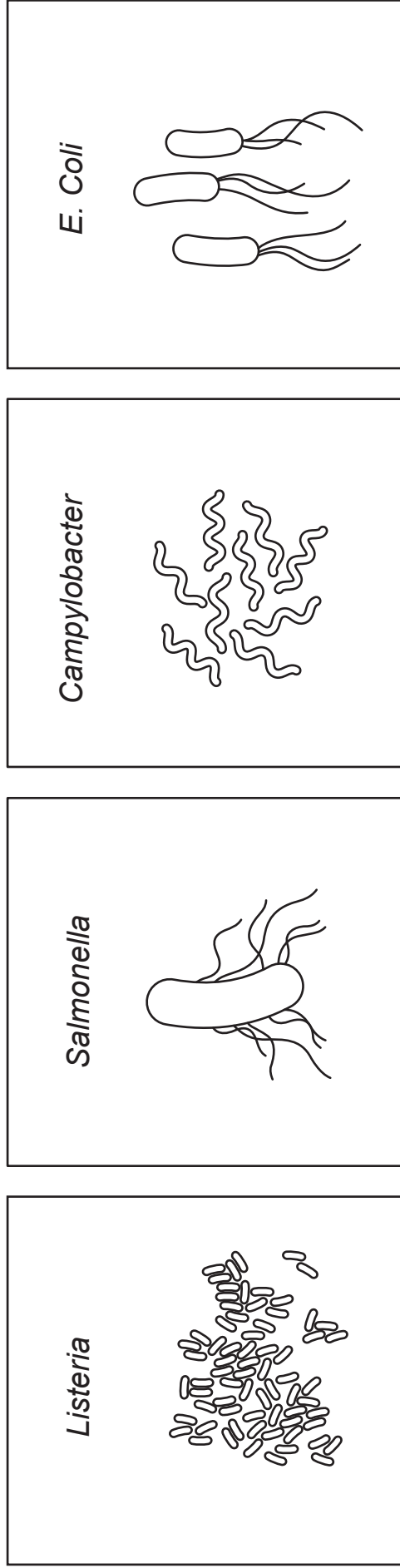


Fig. 17

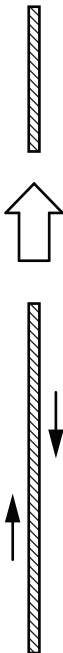
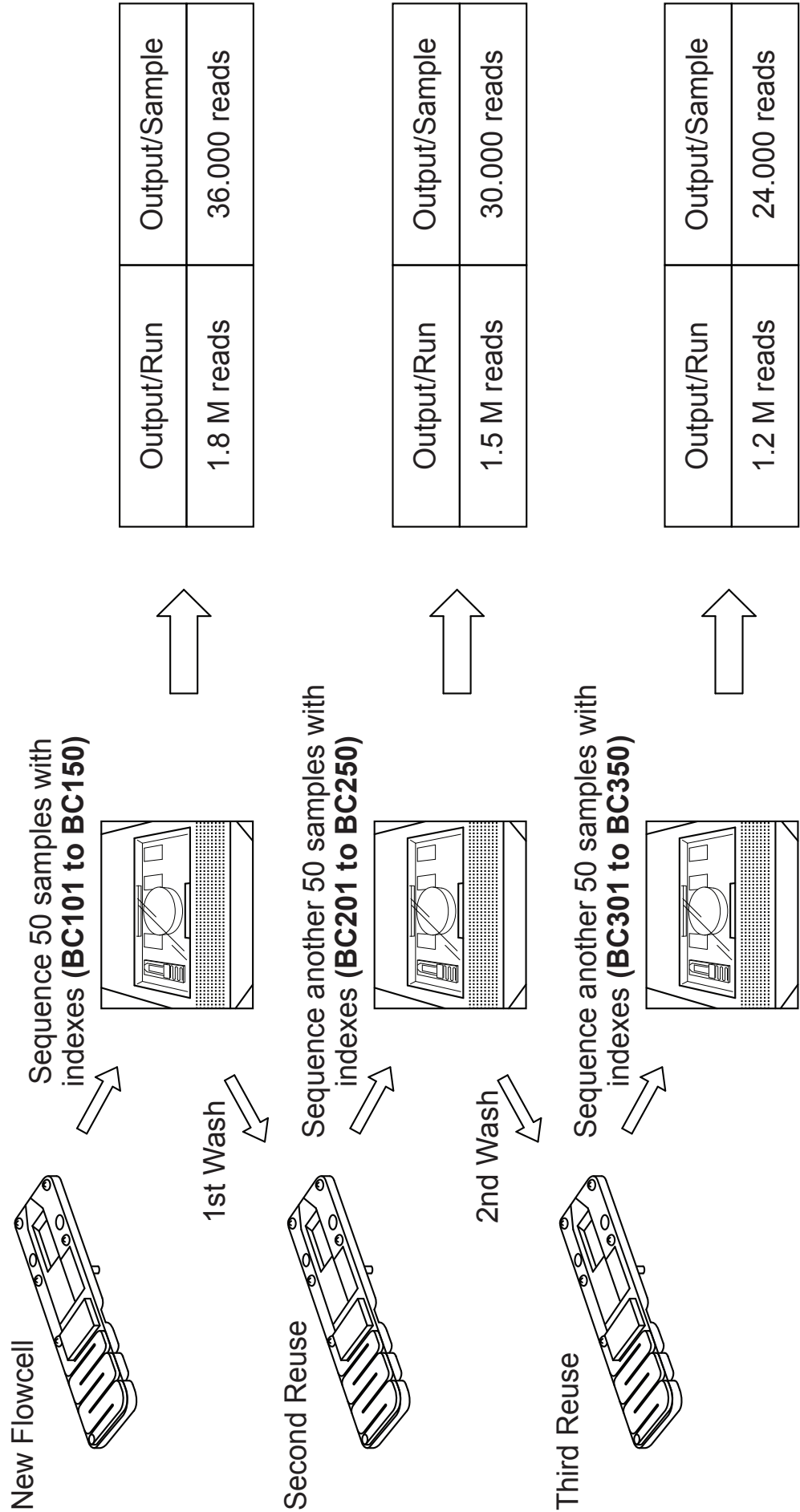
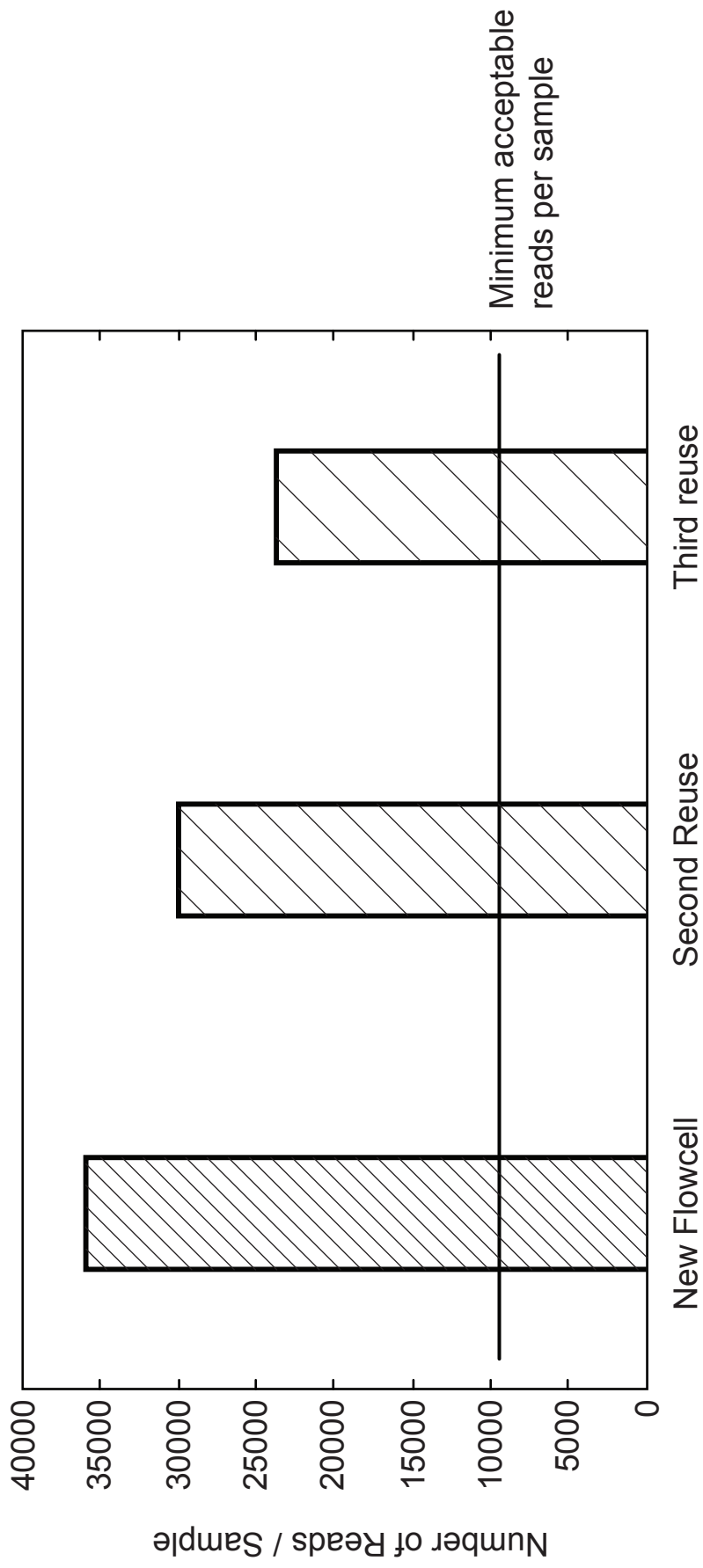
True Positives	
False Positives	
False Negatives	
True Negatives	

Fig. 18



* Minimum acceptable reads per sample is 10.000 reads

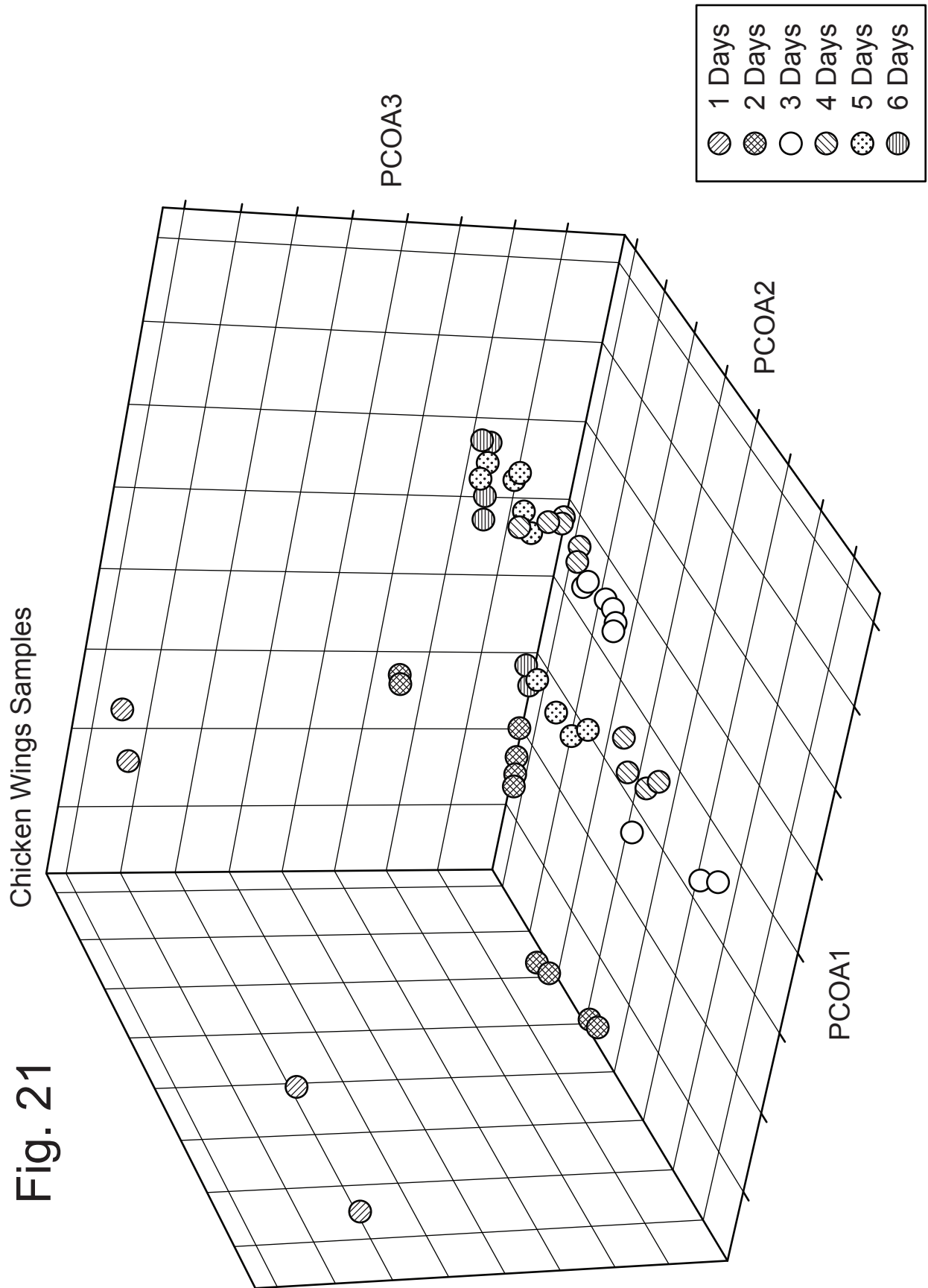
Fig. 19



- The calculation is based on 50 samples / run

Fig. 20

	Manual	Automated	Manual	Automated	Manual	Automated	Manual	Automated
All Reads	2196000	2213000	1945661	1961292	2342638	2467129	1267892	1305108
Enteritidis	✓	✓	✓	✓	✓	✓	✓	✓
Thyphimurium	✓	✓	✓	✓	✓	✓	✓	✓
I 4 [5]_12:i:-	✓	✓	✓	✓	✓	✓	✓	✓
Newport	✓	✓	✓	✓	✓	✓	✓	✓
Javiana	✓	✓	✓	✓	✓	✓	✓	✓
Infantis	✓	✓	✓	✓	✓	✓	✓	✓
Montevideo	✓	✓	✓	✓	✓	✓	✓	✓
Heidelberg	✓	✓	✓	✓	✓	✓	✓	✓
Muenchen	✓	✓	✓	✓	✓	✓	✓	✓
Saintpaul	✓	✓	✓	✓	✓	✓	✓	✓



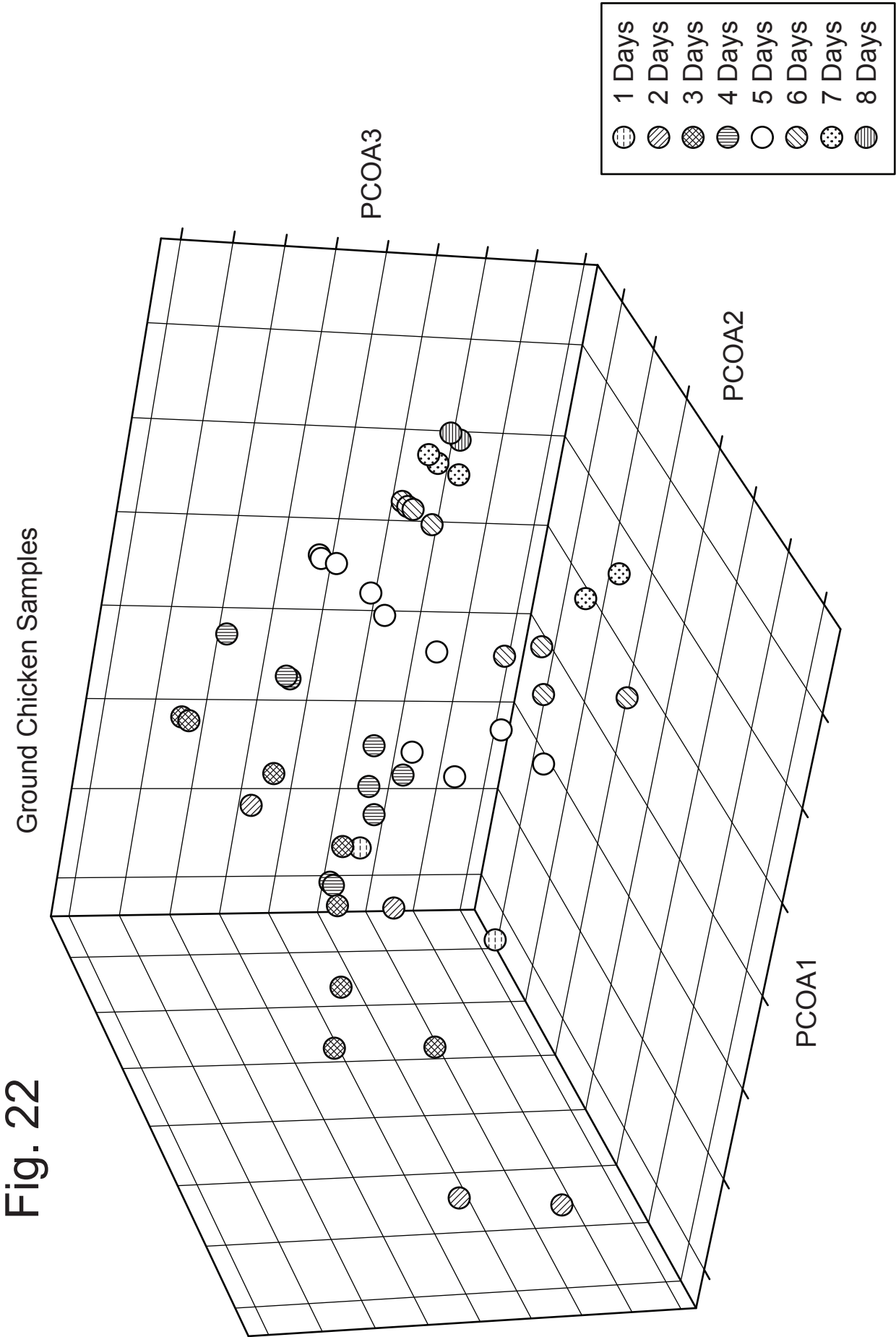
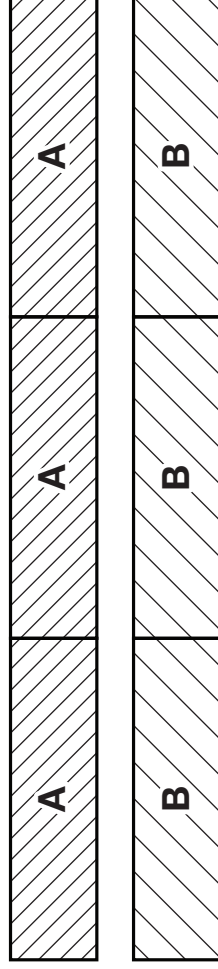


Fig. 23

Generating blocks with pairwise Levenshtein distance as large as possible.

Periodic Block Design: Create barcodes by repeating each block multiple times, in the example figured below 3 times.



Nonperiodic Block Design: Create barcodes by concatenating multiple blocks that are unique to each barcode.



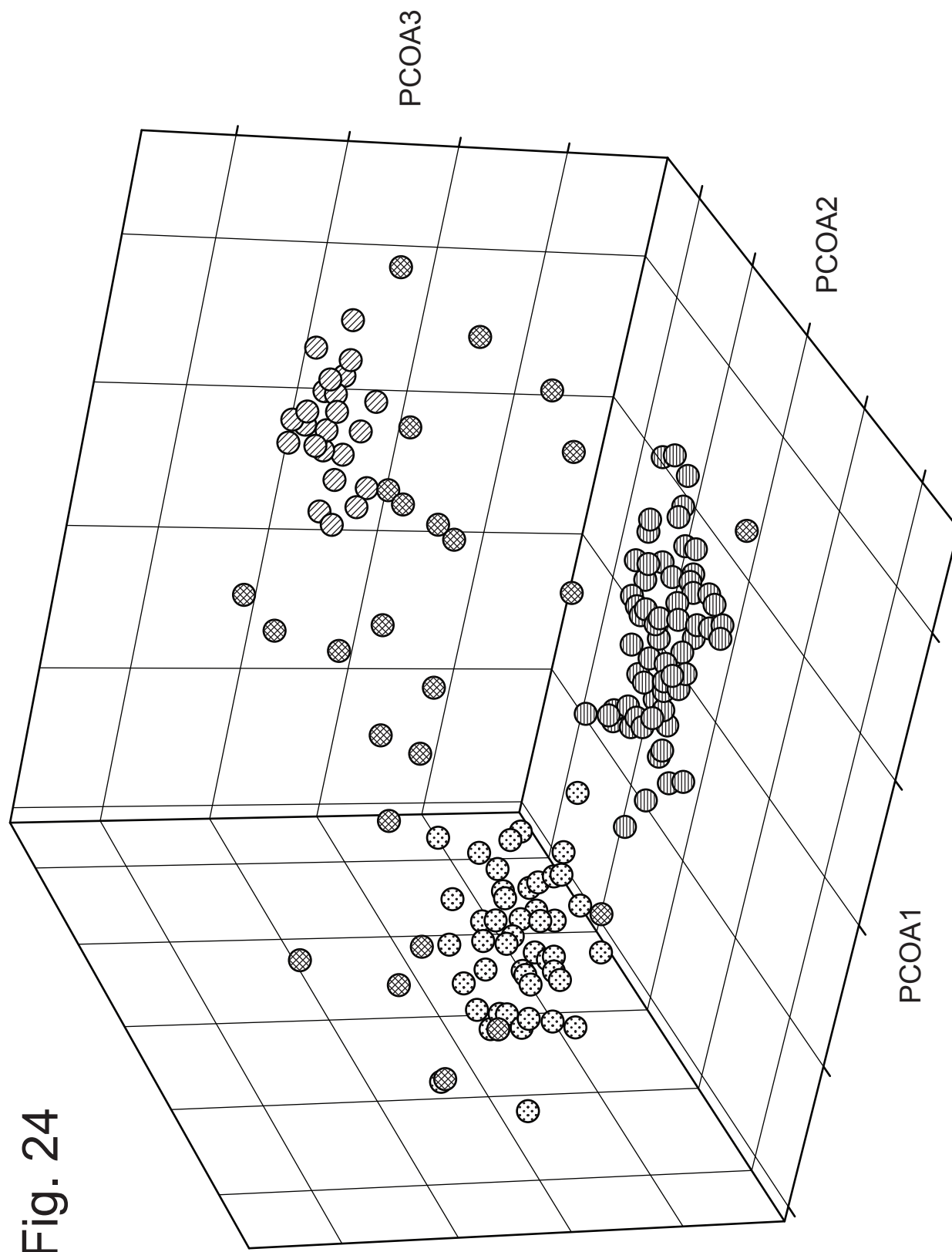


Fig. 25

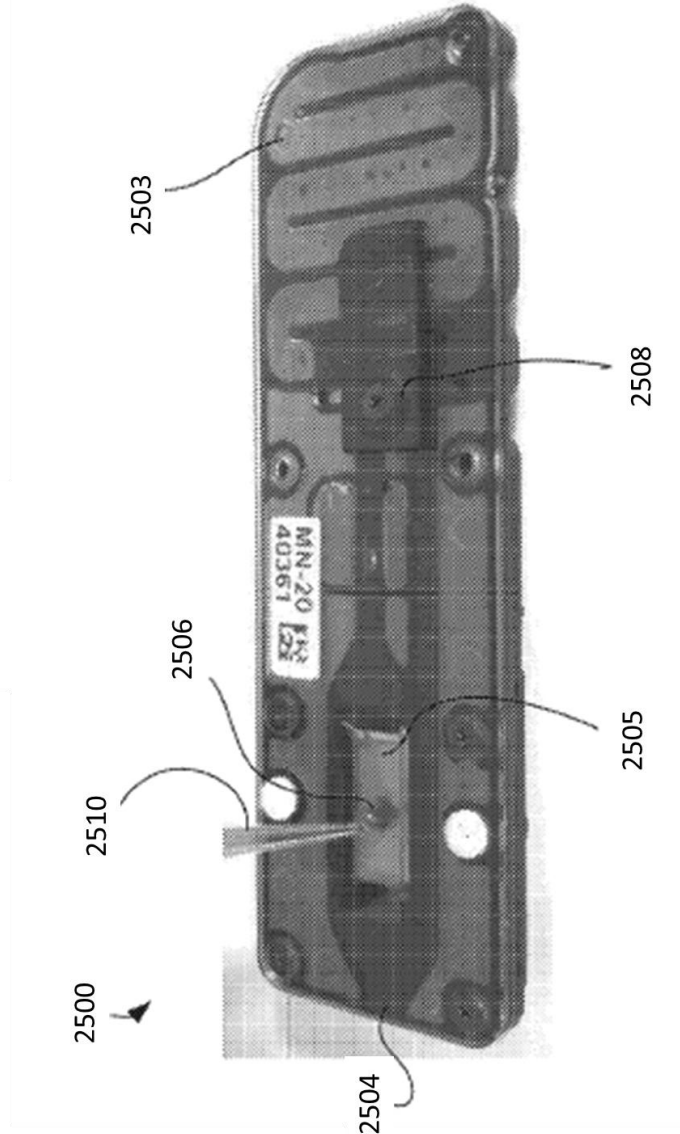
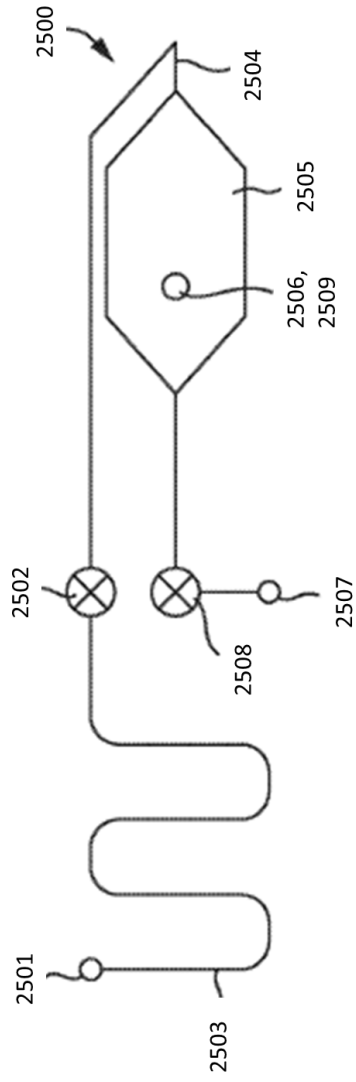


Fig. 26



Fig. 27

