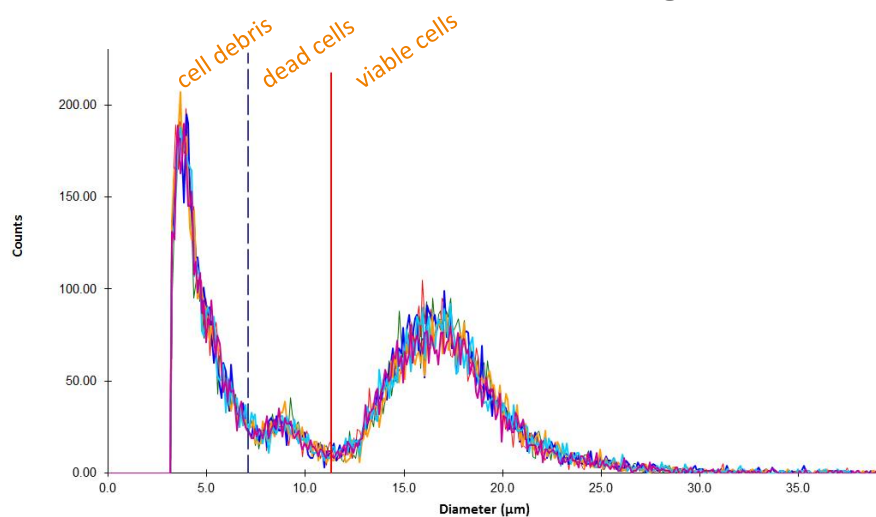


## Cell Counting, Viability Testing and Cell Aggregation Control with High Fidelity *Analysis of Keratinocytes using CASY*



### • Introduction

Here we present original data generated during a live on-site CASY TT instrument demonstration. Aim was to verify CASY's capabilities regarding high reproducibility, fast and easy sample preparation and straightforward live / dead discrimination. After a brief introduction, assays were performed by Kerstin Schenk and Eliane Wandeler, DSM Nutritional Products, R&D Personal Care, Kaiseraugst, Switzerland.



### • Sample

#### Cell Type

Keratinocytes

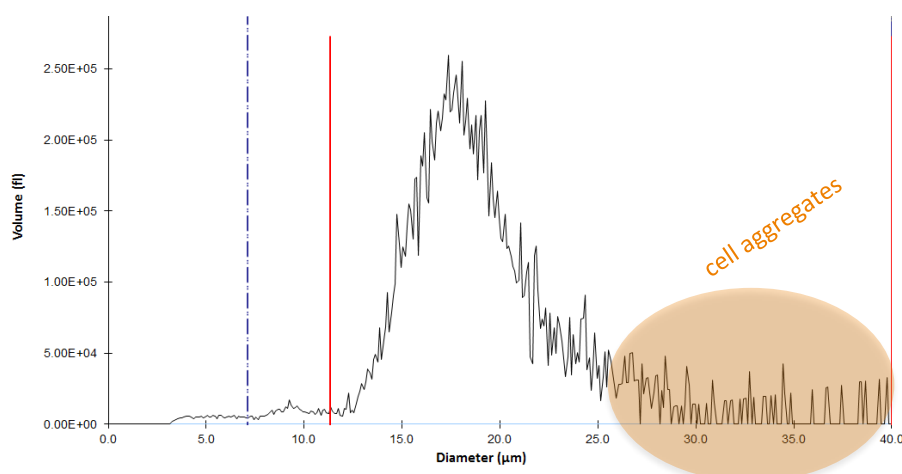
#### CASY Analysis

All samples were analyzed with CASY (150µm Capillary; 3x400µl sample volume; 0-40µm size scale, dilution factor 102)

Graphs of the CASY measurements were created with CASYworX software

**Fig. 1: Overlay of all Keratinocyte technical replicates measurements**

Overlay was plotted from 6 measurements of Keratinocytes using CASY. Single cell peak at 16.59µm, average single cell volume  $2.4 \cdot 10^3$  fl.



**Fig. 2: Visualization of Biomass**

Plotting particle volume against particle diameter displays the biomass of the sample present in cell aggregates (orange area).

## Results

### Standard deviations of repeated measurements

Sample	Agg. Factor	Viable Cells / mL	Total Cells / mL	% Viability	Peak Dia / $\mu$ m
1 <sup>st</sup> Measurement	n.a.	477500	556000	85.88	16.68
2 <sup>nd</sup> Measurement	n.a.	454200	525500	86.44	16.38
3 <sup>rd</sup> Measurement	n.a.	478500	550300	86.94	16.52
4 <sup>th</sup> Measurement	n.a.	446800	519900	85.9	16.81
5 <sup>th</sup> Measurement	n.a.	460000	532300	86.4	16.63
6 <sup>th</sup> Measurement	n.a.	440400	513100	85.8	16.49
Measurement 1-6	Agg. Factor	Viable Cells / mL	Total Cells / mL	% Viability	Peak Dia / $\mu$ m
Average	n.a.	459567	532850	86.23	16.59
Standard deviation absolute	n.a.	14373	15559	0.41	0.1
Standard deviation %	n.a.	<b>3.13%</b>	<b>2.92%</b>	<b>0.47%</b>	<b>0.84%</b>

### Standard deviations taking aggregation control into consideration

Sample	Agg. Factor	Viable Cells / mL	Total Cells / mL	% Viability
1 <sup>st</sup> Measurement	1.273	607900	686400	88.6
2 <sup>nd</sup> Measurement	1.266	575000	646300	86.4
3 <sup>rd</sup> Measurement	1.315	629200	701100	89.7
4 <sup>th</sup> Measurement	1.335	596500	669600	89.1
5 <sup>th</sup> Measurement	1.314	604400	676700	89.3
6 <sup>th</sup> Measurement	1.269	558800	631600	88.5
Measurement 1-6	Agg. Factor	Viable Cells / mL	Total Cells / mL	% Viability
Average	1.30	595300	668617	88.60
Standard deviation absolute	0.03	22864	23473	1.06
Standard deviation %	<b>2.08%</b>	<b>3.84%</b>	<b>3.51%</b>	<b>1.20%</b>

## Conclusion

### High reproducibility of CASY analysis:

+ Cell count StDv < 3.9%

+ Cell Viability < 1.2% StDv

+ Average viable cell diameter < 0.84% StDv

It was demonstrated that CASY allows **fast & simple sample preparation and measurement**. **Cell debris, live and dead cells** were discriminated without the need of dyes instantly during the measurement in size distribution plots (Fig. 1) and statistically in the results section. **Aggregation control** can easily be visualized in biomass plots (Fig. 2) and allows for accurate cell number determination in the statistical evaluation.

## Contact

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