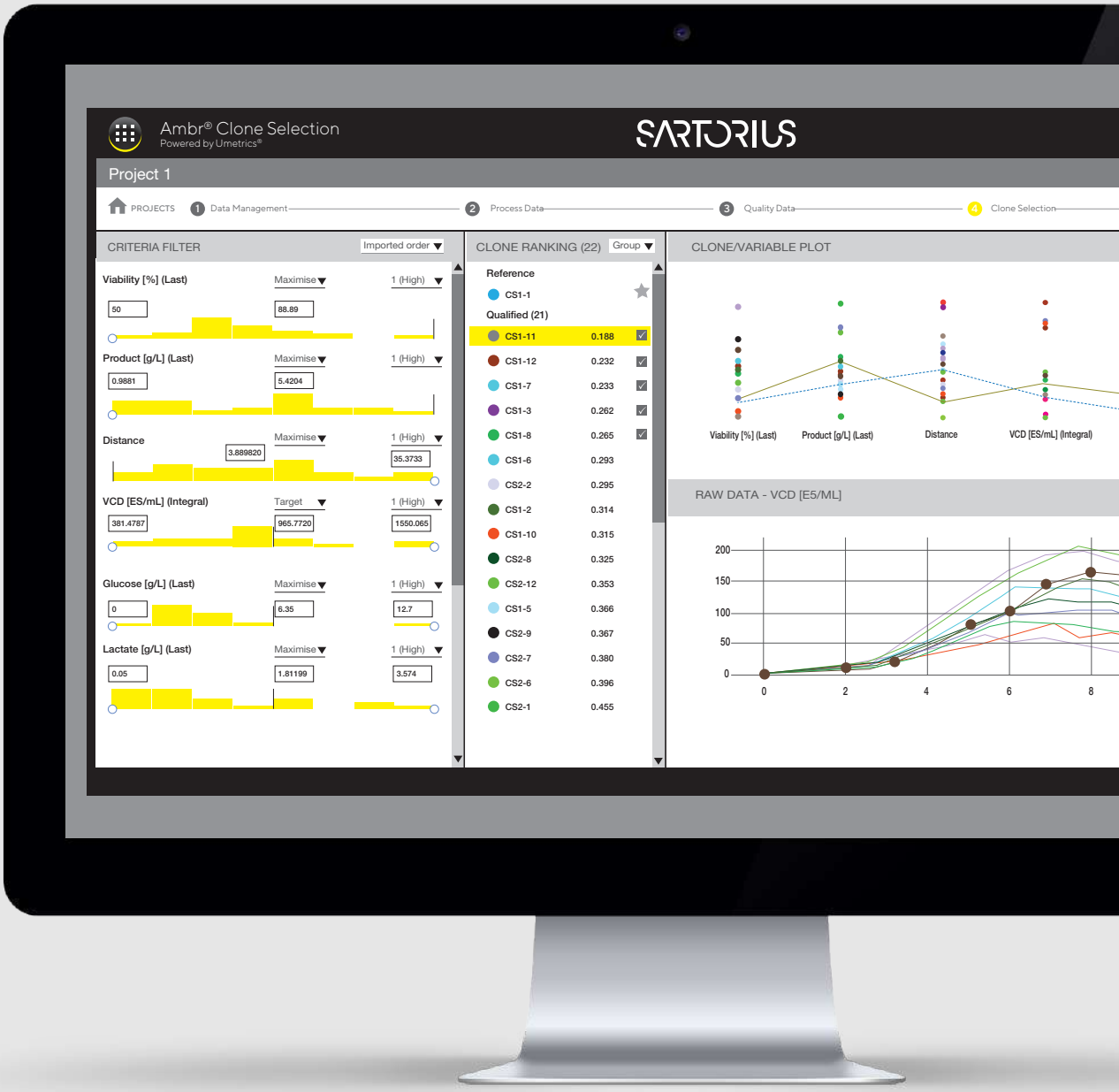


Ambr® Clone Selection Powered by Umetrics®

For Consistent Screening and Ranking

Simplifying Progress

SARTORIUS

Ambr® Clone Selection Powered by Umetrics® Automated Screening and Ranking with Confidence

Ambr® Clone Selection complements the experiments conducted with Ambr® systems. It simplifies the workflow for cell line screening and ranking.

Users define selection criteria such as cell density, product titer and product quality attributes and assign priority weightings in order to screen and rank clones. The application uses a unique multivariable desirability assessment for clone ranking.

Automation of the clone selection process improves speed and consistency
Valuable scientist time is freed up leading to more accurate analyses

Selection criteria profiles may be stored and share within the same server
This means they are accessible to other users in the team and can be applied to new data sets for consistent selection

A report is generated to record the selection criteria and details of the selected clone candidates
This makes it possible to view and understand the selection comprehensively

Maximizes use of data from Ambr® experiments
It can be mined to the full to extract many key insights

Re-evaluate at any time
If selection criteria change during your project, it is fast and straightforward to run the calculation again

Ambr® Clone Selection is flexible
The application can be used with data from Ambr® 15 and Ambr® 250 High Throughput for cell | strain, media and feed screening applications

For more information, please visit
https://www.sartorius.com/en/products/fermentation-bioreactors/software-apps-for-bioreactors/ambr-clone-selection

Ambr® Clone Selection
Automated Screening and Ranking
Accelerating Research with Umetrics® Expertise

Filter area
Selection criteria are defined here as chosen values of key attributes

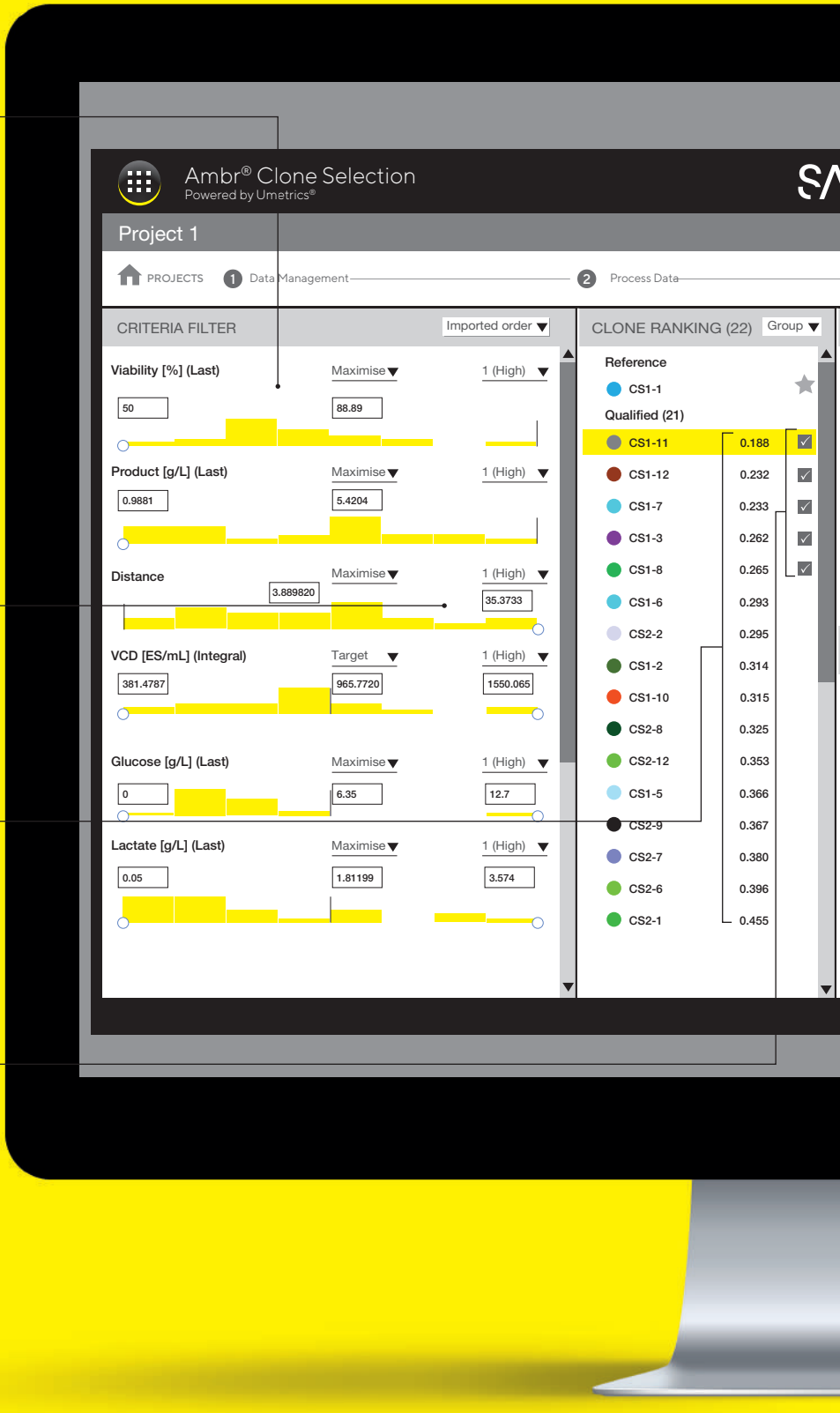
The sliders are easily positioned to give an exact set of parameters which will provide the basis for the statistical analysis

Define objective.
Should the variable be
- high - maximized
- low - minimized
- or meet a specific target?

Priority weightings
User assigns these for each selection criteria that will be used to determine the ranking order of the clones.

Ranking area
A target proximity value is shown next to each clone that represents the distance from the ideal target. Clones are ranked in order according to their proximity (distance) values.

Clones to report on
To make a final selection of clones for the report, check the box next to the clone.



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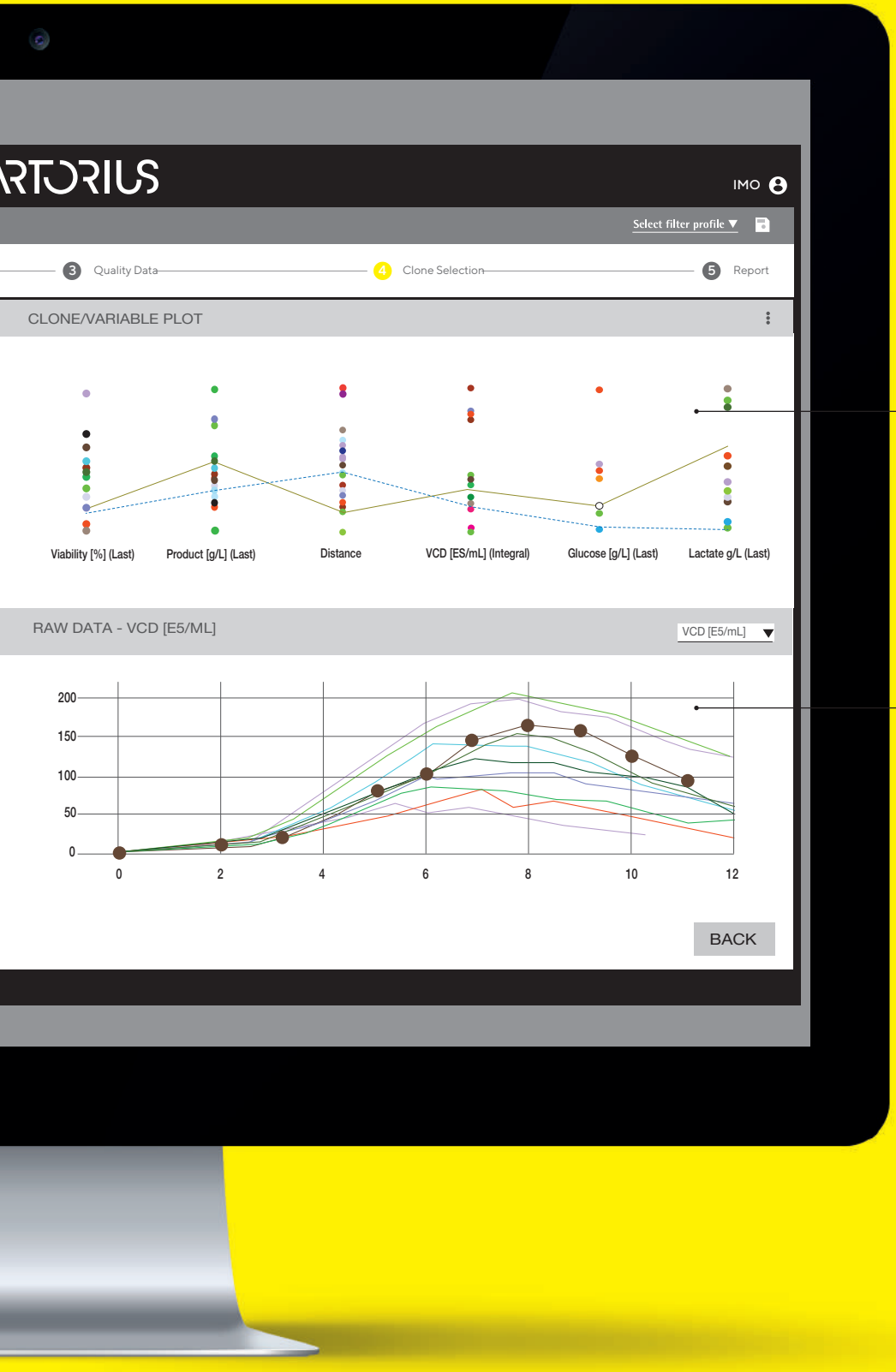


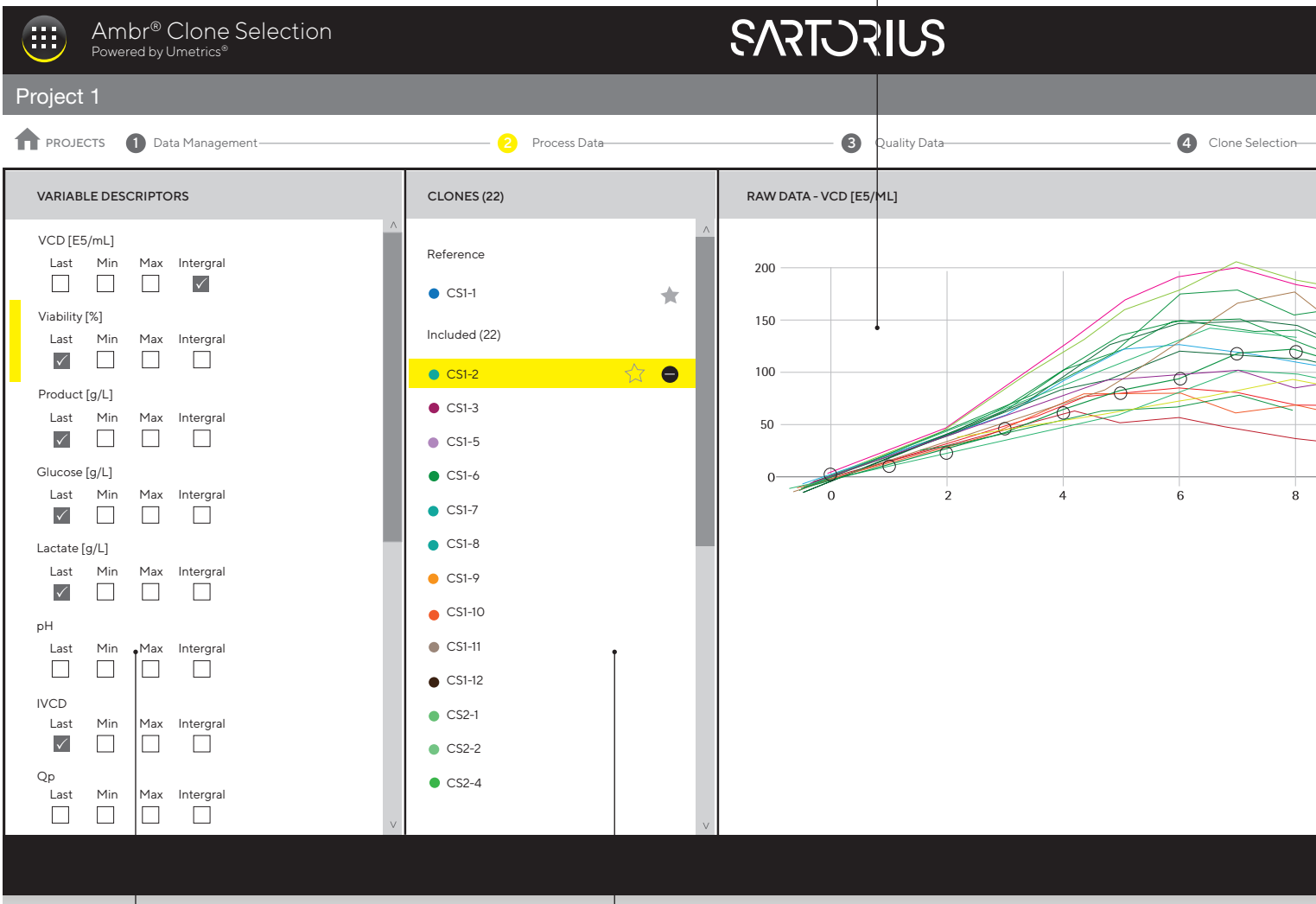
Clone variable graph
The maximum, minimum, last or integral values of the chosen variables are viewed alongside each other and can be compared to a similarity variable (reference), if used.

Raw data graph
Depiction of the raw data profile for selected variable and highlighted clone

Process and Quality Data Views

Upload process and | or quality data for investigation. Timely resolved process data relates to measurements repeated several times during the process run. Quality data is gained from single time points measured during or after experiment completion.

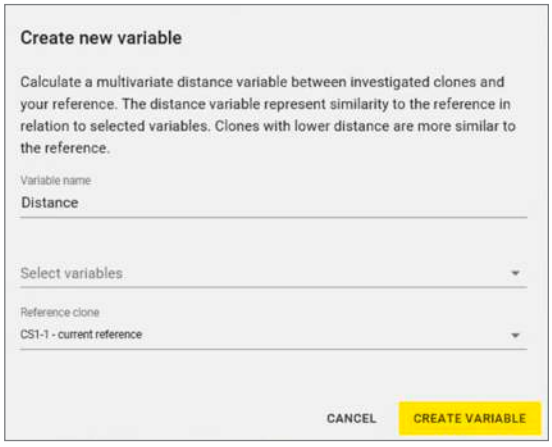
Raw data plot
This shows all included clones and their process trend over time (x-axis)



Variable selection area
List of all selected process variables. Check box to include variable in the clone selection process.

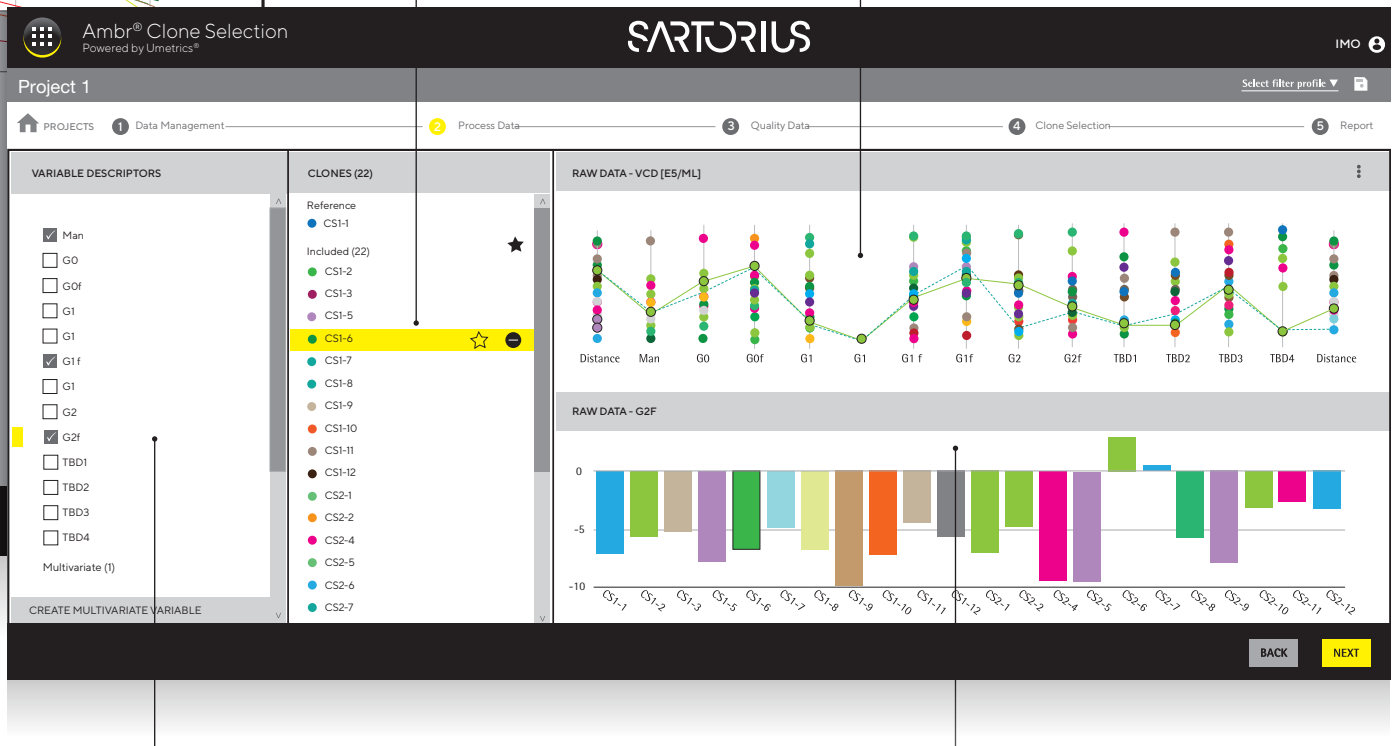
Clones included
Select a clone here to highlight in the raw data plot.

For more information, please visit
https://www.sartorius.com/en/products/fermentation-bioreactors/software-apps-for-bioreactors/ambr-clone-selection



A multivariate similarity variable (such as a glycan profile) can be created and used for comparison as a reference. This feature allows you to calculate similarity of your chosen clone to a reference according to at least 5 selected variables.

Target proximity (distance) represents similarity to the reference in relation to selected variables. The smaller the target proximity value, the more similar the clone is to the reference.



Clones and reference included
As on process data view. Here the user can set a reference clone as indicated by the star to be used in the selection process

Clone variable plot
Displays distribution of each quality variable and the profile for each selected clone.

Variable selection area
List of all quality variables. Check box to include variable in the clone selection process

Raw data plot
Displays the data for all clones in the selected variable.

Reporting Function

Select the candidate clones that you want in your report. A printable report (or save as pdf) from Ambr® Clone Selection software application will include:

- Summary plot of selected candidates and any references
- Table of selected candidates and any references
- A summary of the filter criteria used
- A project summary, listing the profile used, the names of the process and quality data files uploaded and number of candidates and variables used

Technical Specification

The Ambr® Clone Selection application is a client-server software solution; which can be run on the same computer to allow clients local server access. For remote server access, clients must have direct network connection to the server installation/computer.

Each license of the Ambr® Clone Selection software permits up to 10 concurrent users. Additional licenses can be purchased if required.

Only a remote server installation can enable concurrent client usage the software application. If client and server are run on the same computer, only a single client can access the software application.

It is the customer's responsibility to supply the server computer, the client computer and to perform the installation of the software.

Minimum server computer specification requirements:

Aspect	Requirement	Comment
Operating system	Windows Professional 7, 8 or 10 (64 bit)	
Processor	Intel i5-2400 or better (4 cores, 3.10 GHz clock, 6MB cache)	
Anti-virus software	The customer is responsible for installing any anti-virus software required on the computer	
Power	No special requirements - domestic socket suitable	
Memory	8 GB or more	
Hard-disk	500 GB or more; 7200 rpm or more	
Display	Intel HD Graphics 2000 or better. Minimum screen resolution for optimal display: 1280 x 1024 pixels	Typical level of graphics found on a standard PC
Network connections	Required for remote server application i.e. if server and client are not on the same machine	Any interface inside a corporate network is the customer's responsibility. Server does not require remote internet access to run in a closed network

Minimum client computer specification requirements:

Aspect	Requirement	Comment
Supported browser to run software application	Google Chrome >70, Microsoft Internet Explorer 11	
Operating system	Windows Professional 7, 8 or 10 (64 bit)	
Processor	Intel i5-2400 or better (4 cores, 3.10 GHz clock, 6MB cache)	
Anti-virus software	The customer is responsible for installing any anti-virus software required on the computer	
Power	No special requirements - domestic socket suitable	
Memory	2 GB or more	
Hard-disk	500 GB or more; 7200 rpm or more	Client data storage is negligible
Display	Intel HD Graphics 2000 or better. Minimum screen resolution for optimal display: 1280 x 1024 pixels	Typical level of graphics found on a standard PC
Network connections	Required for remote server application i.e. if server and client are not on the same machine	Any interface inside a corporate network is the customer's responsibility. Server does not require remote internet access to run in a closed network

Scalability

Single-Use from Cell Line Selection and Process Development to Production Scale

- Geometrical similarity of vessel design from Ambr® Clone Selection upwards
- Consistent mixing and gassing strategies
- Reliable single-use platform
- Perfusion | perfusion mimic capability
- Microcarrier and specialist mixing at low stirring speed capability

Ambr® Clone Selection
Powered by Ulmetrics®

Identification of Critical Process Parameters, Design of Experiment (DOE) and Process Optimization

Ambr® 15
Cell Culture

Ambr® 250 High Throughput

Biostat® B
Univessel® SU 2L

Biostat STR® 50

Clone Selection

Media and Process Optimization

Process Development

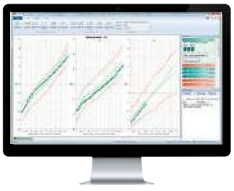
Predictive

Similar Geometry and Sensors

Data Acquisition, Monitoring
and Control of Bioprocesses

Real-Time Multivariate Statistical Process
Monitoring, Cultivation Monitoring
Real-Time Release Testing

Multivariate Data Analysis of Large
Process Data Sets to Identify Key Trends,
Correlations and Troubleshoot



Biostat STR® 200

Biostat STR® 500

Biostat STR® 1000

Biostat STR® 2000

Production

Scalable

- scaling up from 0.025 L to 1000 L

Sales and Service Contacts

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