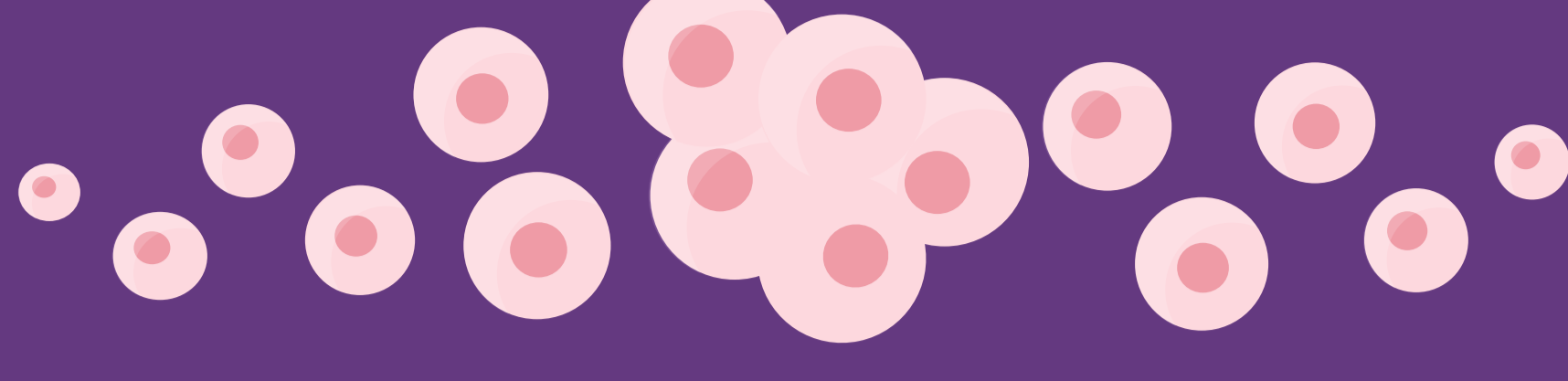


How to characterize organoids

Characterization is an important final step in the organoid workflow, as it provides researchers with information about the structural and molecular properties of cultured organoids.



Two methods of characterization are **live-cell imaging** and **molecular analysis**. The selection of method will depend on the research question, and sometimes both techniques are used in parallel to generate more insight into biological processes.

Live-cell imaging as the endpoint assay

Usually, researchers use live-cell imaging to understand structural changes of organoids, viability and response to certain treatments.



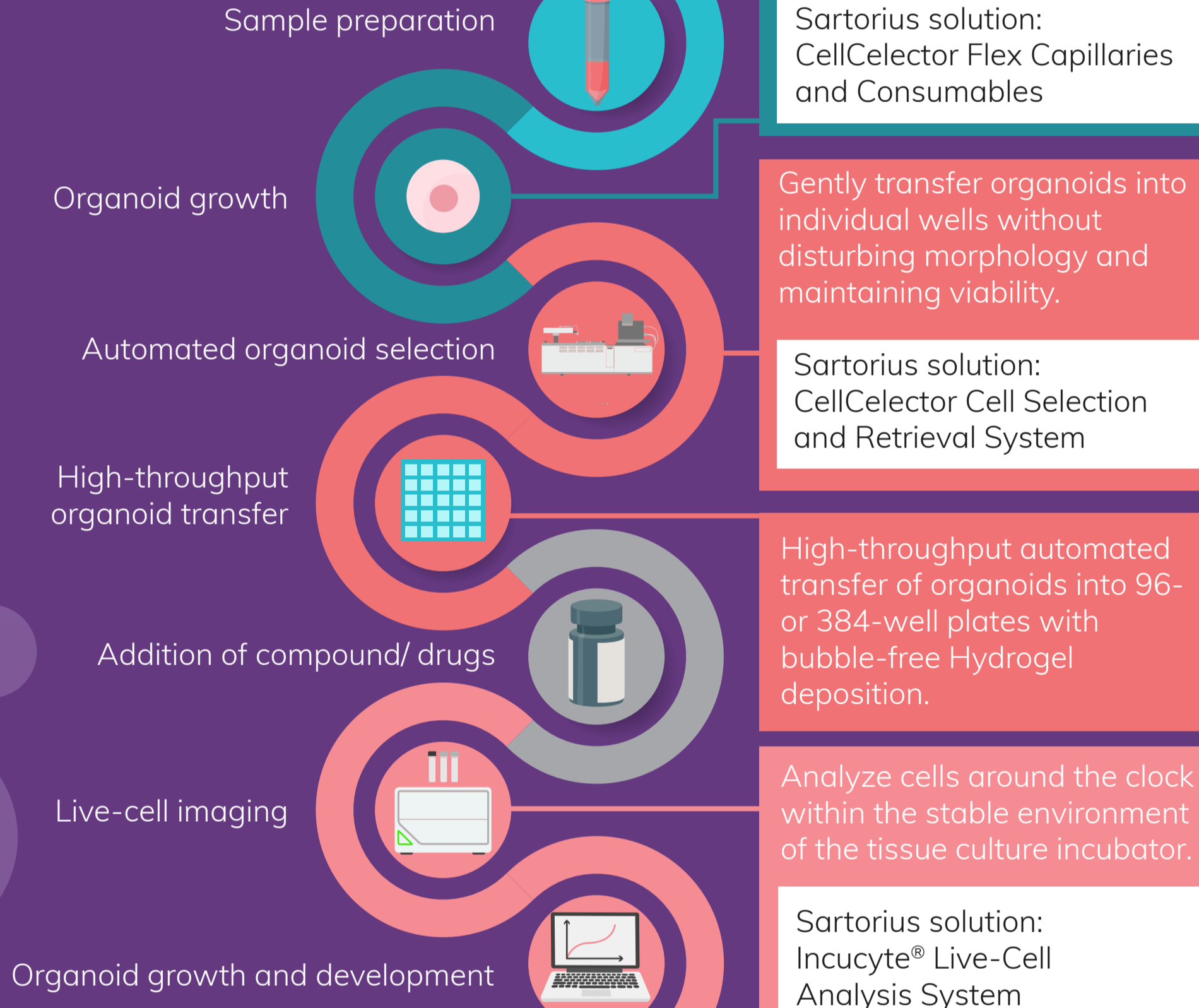
Advantages

- Real-time visualization of cellular processes and dynamic changes
- Provides insights into the behavior of cells in response to treatments
- Study cell migration, cell-cell interactions and other complex cellular processes

Challenges

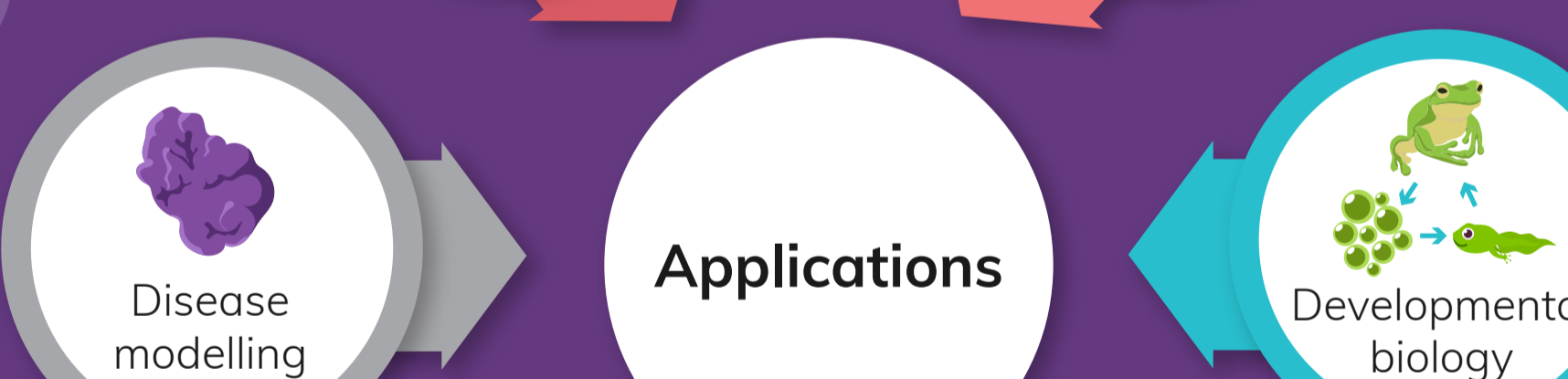
- Time-consuming and requires long-term imaging sessions
- Difficult to quantify (like cell-cell interactions)
- For fluorescence imaging:
 - Limited by the depth of imaging, as light penetration is limited in thicker tissues
 - Limited by the phototoxicity of the imaging process, which can damage cells and tissues over time

Workflow



Molecular analysis as the endpoint assay

Molecular analysis provides a much more detailed understanding of molecular properties such as genetic profile, protein content and metabolic activity.



Advantages

- Identify specific proteins, genes and other molecular markers
- Quantify the expression levels of genes and proteins
- Understand changes in gene expression or protein levels in response to stimuli or treatments
- Identify potential drug targets or biomarkers for disease

Challenges

- Static information – does not provide insights into dynamic changes in cells
- Quality of the tissue or cell sample can affect the accuracy of the results
- Complex data analysis, which can require specialized expertise and computational resources

Workflow

