

## Primary human hepatocyte characterization for drug discovery

Reviewing a certificate of analysis is a good starting point when it comes to choosing primary human hepatocytes for preclinical drug discovery applications, but it shouldn't stop there. Researchers can go a step further by developing a characterization strategy that takes experimental design, testing platform, and goals into account to ensure the best match for each study. Key issues to consider include:

- **Degree of plateability.** The attachment efficiency of each batch of cells, and how effectively they work in different plate configurations and platforms, can be critical for successful outcomes when choosing primary human hepatocytes. “Bear in mind, something that attaches just fine in a 24-well plate or a six-well plate, may not necessarily work well or attach effectively in a 96-well or a 384-well format,” said LifeNet Health Chief Scientist Ed LeCluyse, PhD.
- **Longevity.** The duration of experiments plays a big role in determining performance specifications. In some cases, short-term plateable or suspension hepatocytes that can perform for up to 72 hours may be sufficient. Other researchers planning 96- or 384-well plate testing may require hepatocytes that can plate up to three weeks for certain applications.
- **Life stages, or donor ages.** Neonates up to 2-year-olds may not have the same phenotype as adults. Researchers should consider partnering with an organization that can offer a diverse range of donors, for the best match depending on the questions the study is trying to answer.
- **Healthy vs. diseased hepatocytes.** Researchers need to consider whether their needs are better served by artificially inducing a disease state into healthy cells vs. starting with cells from diseased tissues. “I think they're both legitimate approaches as long as you know what questions you want to answer, and be aware they do begin and arrive at different points depending on your study design and culture conditions,” Dr. LeCluyse said. Either way, proper qualifications are vital, especially for disease modeling and toxicology studies. Detailed histopathology reports can support researchers as they make these selections.
- **Beyond post-thaw viability and yield assessment.** Cell survival and performance after cryopreservation are dependent on a number of factors depending on the culture platform and application. Most researchers are focused on the percentage viability alone (e.g.  $\geq 70\%$ ) for their initial selection of lots. However, other morphological and binding features should be considered for researchers who intend to use discerning techniques such as high-content imaging, spheroid formation, and MPS systems. LifeNet Health LifeSciences offers lots with 80%-plus post-thaw viability as well as information about other important lot characteristics that will increase the likelihood of success.
- **Number of cells per vial.** Microchip and newer fluidic technologies may require fewer cells per chamber. Other applications – or a plan to run additional experiments – may create a need for more cells per vial. At LifeNet Health LifeSciences we offer a greater variety of options to meet specific research and application needs.
- **Number of vials per lot.** “Not all lots are of equal size,” Dr. LeCluyse said. LifeNet Health LifeSciences hepatocyte lots average 450 vials per lot but can be as high as 1,200 vials.

Application of the cells is also vital. It's important to consider hepatocyte function within this context: Will the selected lot be able to perform as needed? Researchers using a 3D model, for example, will want to choose cells that exhibit good self-adhesion and engraftment characteristics such as forming spheroid structures *in vitro*.

Whatever the concern, LifeNet Health LifeSciences offers support before, during, and following purchase – from lot selection to troubleshooting advice. This level of partnership can make all the difference to ensure a successful study. Learn more about our [large inventory of primary human hepatocytes](#).