

Ion channel screening in an Instant

By Johan Falk

Gone are the days of laborious cultivation and culling of cell lines, before even getting to the electrophysiological screening of new compounds. With Instant Cells Cytocentrics provides a technology that facilitates fast, reproducible and highly reliable results.

PATCH CLAMP For a successful testing with patch clamp the quality of the cell lines is of course crucial. What used to be a costly and time-consuming process can now be achieved within fifteen minutes. Instead of maintaining an own cell line, cultivating and splitting it, the frozen cells that are the key of the Instant Cell system are ready-to-use in less than 15 minutes after thawing.

“Our customers also get the benefit of having a quality assured batch of cells that have clearly defined cell resistance and reproducible dose response curves,” Dr. Corina Ehnert of Cytocentrics says.

Currently, Cytocentrics have two frozen recombinant ion channel cell lines commercially available: the hERG-HEK 293 ion channel, a conduit into the cells of importance for the cardiac system, and the Nav 1.5-CHO ion channel, also of huge importance for the heart. Both of these cell lines can be used with automated and manual patch clamp, high-throughput screening, flow-cytometry and other fluorescence-based assays.

“We have collaborated with customers to make sure that the Instant Cells works

flawlessly on systems such as IonWorks and PatchXpress,” Dr. Corina Ehnert says.

Frozen in liquid nitrogen the cells in their caps have a shelf life of years. This stability gives the user of the Instant Cells a high degree of flexibility, for example when running tests for cell lines that are not used often. Frozen in caps for tubes, the Instant Cells can immediately be suspended in the assay of choice and be used for the next four hours with quality assured results.

“Each batch of our frozen Instant Cells comes with a quality assurance that all the cells are of the same quality. We are currently scaling up the process, so that a batch will comprise of more than 150 caps,” Dr. Corina Ehnert of Cytocentrics says.

To further improve the quality for the

user Cytocentrics has also developed the Cell Reservoir, a stand-alone bench-top storage device for suspended cells to maximise the cell vitality.

Cell lines for instant use

Cytocentrics are not limiting themselves to only providing their own cell lines as Instant Cells. A client can of course approach them with their own cell line that they want to have as Instant Cells.

“We have good experience in adapting common cell lines into Instant Cells, such as CHO-, hERG- and TE 671-cells,” Dr. Corina Ehnert of Cytocentrics says.

The process of providing Instant Cells can include optimisation of voltage protocols, buffer and media compositions and sub-cloning in order to find the optimum ion current expression for the cell line in question.

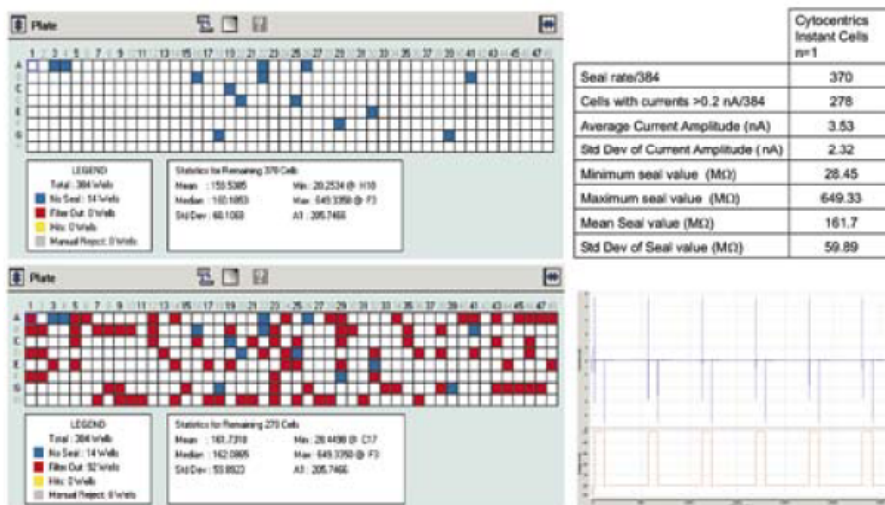
“Basically, what we need to know from our client is everything that makes their cells happy, such as buffer protocols and media for growing the cell cultures,” Dr. Corina Ehnert of Cytocentrics says.

For CHO or HEK cells the timeline from start to finished frozen cells lies in the range of four to five weeks, if optimisation is needed it will of course take longer.

“Depending on our agreement with the client, we can either destroy the cells after having produced and delivered the required amount of Instant Cells or we can keep the cell line in stock and produce more Instant Cells on-demand,” Dr. Corina Ehnert of Cytocentrics says.

With Instant Cells the focus of researchers can now be wholeheartedly directed on ion channel screening, not on cell cultivation and worries about changing quality. “Our quality assurances include that at least 90% of the cells in a batch must express the desired ion current and 70% of the cells must have a membrane stability of over 30 minutes,” Dr. Corina Ehnert of concludes. ❖

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Example of Nav1.5 ion currents recorded from CHO Instant Cells on the Ionworks Quattro using CsF based internal solution. Recordings were done by Rebecca Prime at Pfizer, UK.