Synthetic hydrogels improve testing of active substances in 3-D cell culture

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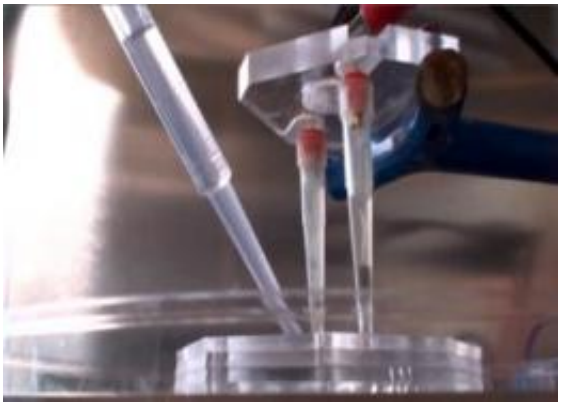

The life science company Cellendes in Germany has developed synthetic hydrogels that make it possible to culture cells in three-dimensional environments. Their invention has fundamental advantages over other hydrogels for three-dimensional cultivation, also on the market.

Many researchers culture cells in flat dishes, two-dimensional culture systems. A disadvantage is that the cells behave differently than they would in a living organism. To offer an environment that resembles the living organism better, Dr. Birgitte Angres and Dr. Helmut Wurst have developed synthetic transparent hydrogels for three-dimensional applications within their life science company Cellendes (Cell-Environment-Design).

“Compared to other hydrogels on the market ours can be much easier modified with bioactive factors such as peptides right at the bench. So customers can choose which peptides they want to include in their culture. They can either purchase them from us or have their own being synthesized. Secondly, the concentration of bioactive factors, such as peptides, in our gels can be much higher than in the competitors’ gels,” Dr. Helmut Wurst said.

The hydrogels are made in a few minutes by combining two solutions in the form of an activated polymer and a cross-linking agent. Through a chemical reaction the polymers use the agent to link themselves together and a three-dimensional network, where the average pore is about eight nanometers wide, forms. Before the linking occurs it is possible to bind biofactors to the polymer and mix in cells.

The biggest challenge, from a technical point of view, during the development of the hydrogels has been to make these components reproducible. “You can do it once and then the next time maybe a little bit different, but you want to make a reproducible quality of your different components and I think that is the biggest problem,” Wurst said.

At the moment Wurst and his colleagues are trying to make it possible to store and ship the gels at room temperature and not in refrigerated conditions, to save costs in shipping. They also want to make the gels form a little bit slower. “The gels form so fast that it is sometimes difficult to mix the two different solutions completely,” Wurst said.

Almost all of Cellendes’ customers are doing basic research within the field of the life sciences. However, their hydrogels could also be useful in the chemical industry and within drug and cosmetic development. “Efforts are made to reduce the number of experimental animal testings. In our system the cells are cultured in a more natural environment and

could replace certain animal models," Wurst said.

Within the European Commission-funded project ProNano - Promoting Technology Transfer of Nanosciences, Nanotechnologies, Materials and new Production Technologies, Cellendes researchers have been selected to receive coaching to make their results in nanotechnologies reach the market.

Source: Youris.com