Small molecules for neural stem cells

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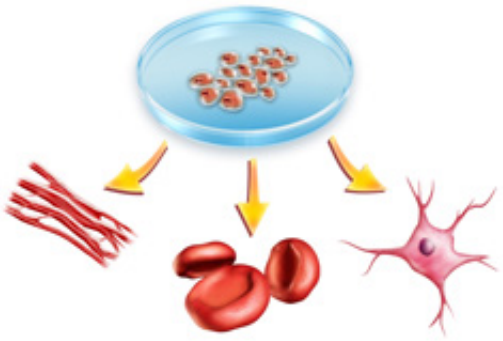

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European scientists used chemical genetics to discover molecules that could serve as future regenerative medicines to treat neurological and neurodegenerative diseases.

Stem cells hold tremendous potential in regenerative medicine for tissue repair and therapy. However, despite extensive research, manipulation and maintenance of the stem cell properties still pose a challenge to scientists worldwide.

Small molecules can substitute for biological signalling factors for the maintenance of mouse embryonic stem cells and a similar approach is believed to hold for other stem cell populations. Chemical modulators augmenting the growth, survival or differentiation of neural cells have a prospect as preventative or regenerative strategies for neurodegenerative

diseases. Similarly, inhibitor compounds may serve to block the growth of neural cancer stem cells.

The ultimate aim of the EU-funded project 'The discovery of future neuro-therapeutic molecules' (Neuroscreen) was to discover potential drugs of relevance to neurological diseases, regenerative medicine and cancer. More specifically, project partners focused on designing unique bioassays in order to develop and evaluate the biological modulating capacity of small molecules.

These molecules were designed and synthesised using advanced chemistry and tested on rodent and human neural cell lines before moving on to neural stem cells. Partners proposed that small compounds had enormous commercial potential as they would enter the market through a rather expedited process and would serve as culture media additives, reducing the cost of stem cell culture.

Furthermore, procedures for checking the quality of neural stem cells were standardised and a storage facility was established. This ensured consistency in the source of biological material.

Neuroscreen set up a successful workflow starting from unique bioassays and a stem cell bank to automated screening of small compounds. These tools will prove essential for translating knowledge into new products, processes and services, benefiting patients and improving public health.

Provided by CORDIS