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Czerwona biotechnologia

Individualisation of cancer treatment using personalized tumorgrafts

Molecular Cancer Therapeutics published recently the results of a cutting edge pilot study of treatment guided by personalized tumorgrafts in patients with advanced cancer. In a study led by Manuel Hidalgo, Director of the Clinical Research Programme at the Spanish National Cancer Research Centre (CNIO), 14 patients with advanced solid cancers were evaluated in a personalised tumour model created by implanting fragments of tumour tissue in immunodeficient mice, which were treated with 63 anticancer drugs, both as single agents and in different combinations. Using such approach, an effective treatment regimen in the xenograft model was identified for 12 patients. 11 of them received 17 prospectively guided treatments, and 15 of these treatments resulted in durable responses. No effective treatments were found in 2 patients. The authors reported a remarkable correlation between drug activity in the model and clinical outcome, both in terms of resistance and sensitivity.

Results presented by Hidalgo and colleagues are very promising, however there are several limitations in application of such approach in clinics. Firstly, this procedure requires fresh tumor which is difficult or impossible to obtain in many patients. Moreover, usually it takes 6-8 months to grow a tumor in mice and obtain graft and it can be achieved in around 60% of cases. Also, in some cases an effective treatment cannot be found. Another obvious limitation is the cost of this type of personalized treatment. Nevertheless, the group of Manuel Hidalgo is going to conduct further research to develop methods which would allow to solve these problems and to make this technology widely available for patients. The study is conducted in collaboration with Johns Hopkins's University in Baltimore, USA, Hospital de Madrid, Spain,

and the company Champions Oncology, Baltimore.

Sources:

- 1) Hidalgo M, Bruckheimer E, Rajeshkumar NV, Garrido-Laguna I, De Oliveira E, Rubio-Viqueira B, Strawn S, Wick MJ, Martell J, Sidransky D. A pilot clinical study of treatment guided by personalized tumorgrafts in patients with advanced cancer. *Mol cancer Ther.* 2011 Aug;10(8):1311-6. Epub 2011 Jun 14.
- 2) Spanish National Cancer Research Centre (CNIO) website, 16tcch of August 2011, <https://www.cnio.es/ing/news/prensainternacional.asp>

FDA approved first cell therapy against wrinkles

In June 2011, United States Food and Drug Administration (FDA) approved the Biologics License Application for laViv (azficel-T) – the first personalized cell therapy. The product was developed by Fibrocell Science, Inc. (Exton, PA), a biotechnology company that focuses on the development of personalized autologous cell therapies for aesthetic, medical and scientific applications. laViv is intended to improve the appearance of moderate to severe nasolabial fold wrinkles (smile lines) in adults. laViv is an autologous cellular product composed of fibroblasts suspended in Dulbecco's Modified Eagle's Medium (DMEM) without phenol red. Firstly, patient's own dermal fibroblasts are harvested from behind the ear through the skin biopsy. Next, the cells are aseptically expanded using standard tissue culture procedures. The recommended course of laViv administration is a series of three treatments, typically three to six weeks apart. The process for production of laViv takes approximately 11 to 22 weeks. Investigators involved in the clinical trials of laViv point out that people who can afford this type of cosmetic treatments may be especially

attracted to the idea that their own cells are used in this approach rather than artificial fillers. Moreover, the investigators claim that the effect seems to be longer lasting in comparison to the other fillers available. Noteworthy, laViv is only the third cellular therapy product approved in the United States so far. The two other FDA approved products have strictly medical use: Carticel (autologous cultured chondrocytes) developed by Genzyme (Cambridge, MA) is used to repair knee injuries and Provenge (sipuleucel-T), manufactured by Dendreon Corporation (Seattle, WA), is used to treat metastatic hormone-refractory prostate cancer.

Sources

- 1) laViv (azficel-T) Product Information on FDA website, last updated on 20th of July 2011, www.fda.gov/BiologicsBloodVaccines/CellularGeneTherapyProducts/ApprovedProducts/ucm260485.htm
- 2) Fibrocell Science Inc. Media Center, 22nd of June 2011, www.fibrocellscience.com/media/media.htm
- 3) Schmidt C. (2011) FDA approves first cell therapy for wrinklefree visage. Nat. Biotechnol. 29(8): 674-675. doi: 10.1038/nbt0811-674



A celery gene may protect roses from disease

Researchers from the North Carolina State University have undertaken the study intended to overcome petal blight in roses – one of the most common post-harvest diseases, which significantly shortens their longevity.

Several fungal plant pathogens secrete mannitol - an agent interfering with the plant's defence mechanisms. Many plants naturally produce mannitol dehydrogenase (MTD) which catabolizes mannitol of fungal origin. It is not well characterized whether roses produce this enzyme, but even if they do, the amount is not sufficient to protect them from the unfavorable effect of mannitol. MTD was already demonstrated to improve defence mechanisms, for instance in petunias. Therefore, North Carolina State University horticultural scientists, Dr. John Dole and Dr. John Williamson, introduced the MTD celery gene into the rose's genome to improve the

mannitol-catabolizing capacity. Genetically modified roses growing in North Carolina State University greenhouses look and smell just like the conventional roses. In the nearest future it will be tested whether they became more resistant to the petal blight.

Mick Kulikowski, the editor of News Services of the North Carolina State University, summarized this innovative study with a short biotech rhyme: "Roses are red, Celery is green, Roses last longer with a celery gene".

Sources

- 1) North Carolina State University News Services, 10 February 2011, <http://news.ncsu.edu/releases/mkrose>;
- 2) North Carolina State University website: <http://web.ncsu.edu/abstract/science/roses-celery-gene-longer-rose-vase-life>.



15th European Congress on Biotechnology

The Biotechnology Association of Turkey, together with the European Federation of Biotechnology (EFB), will organize the *15th European Congress on Biotechnology of the European Federation of Biotechnology - ECB15*, which will be held in Istanbul on 23-26 September 2012. The organizers intend to attract top scientists, decision and policy makers, high-tech and start-up companies, entrepreneurs, investors and students from Europe, Asia and the Middle East.

The main theme of the *15th European Congress on Biotechnology* is *Biocrossroads* - analyzing the impact of the life sciences industry in addressing humanity's great challenges. It will be covered by 4 parallel sessions: *Health & Medicine* - focusing on the latest achievements in biotechnology to improve existing treatments and put forward novel approaches, with a special focus on the development of new innovative and targeted therapies; *Industrial Biotechnology* - a multidisciplinary approach including applied biocatalysis, biochemical engineering, microbial physiology and systems biology – all focused on innovation in industrial biotechnology and the development of the Knowledge-Based Bio-Economy; *Plant & Environmental Biotechnology* - exploring the benefits and challenges derived from the application of biotechnologies in agriculture and their key role in providing the biomass the world needs; *Systems Biology & Technology* - novel “omics” and technology based approaches for dramatically increasing and improving capacities for experimentation.

Deadline for abstract submission is the 1st of April 2012. A number of abstracts will be selected for oral presentations. All other qualifying abstracts will be selected for poster presentations. Further information is available on the website: <http://www.ecb15.org>.

Environmental Microbiology and Biotechnology conference

On 10-12 April 2012, University of Bologna, Italy will host the conference *Environmental Microbiology and Biotechnology in the frame of the Knowledge-Based Bio and Green Economy (EMB2012)*. The event is organized by the Environmental Biotechnology section of the European Federation of Biotechnology (EFB) in cooperation with the Federation of European Microbiological Societies (FEMS). The program will be especially focused on the advances in sustainable decontamination of polluted habitats, purification and reuse water resources, biofixation of climate change-inducing gases and the production of biobased chemicals, materials and fuels from biowaste. Organizers will address several priorities of the *Europe 2020* strategy with intention to contribute to build up a more sustainable and competitive knowledge-based economy in Europe and in the Partner Countries. Abstract submission is open until the 1st of February 2012. The best papers will be invited for the full publication in *New Biotechnology*. More details about the conference may be found at: www.unibo.it/EMB2012.

Science Multimedia Center

For those who admire the access to science not only through research papers but also through images, sound and motion, *Science* magazine offers a rich collection of the *Science* Multimedia Center. This service, which is free of charge for all *Science* website users, gathers unique podcasts, webinars and video presentations concerning various topics from the area of life sciences.

Video portal section includes recordings tied into *Science* special issues or particularly interesting supplemental video from *Science* research papers. *The Science Online Seminars* - a joint project of AAAS's Office of Publishing and Member Services together with Biocompare company,

is a separate service in which authors of selected breakthrough research papers discuss their work. The *Science* Multimedia Center contains also *Science Magazine Podcasts* section with periodic audiocasts, providing original scientific research news and commentaries. They are available free of charge not only through the Science website, but also through the iTunes store where the podcasts can be downloaded directly to the iPod. Moreover, the *Interactive Features* section contains elaborate presentations of selected cutting-edge scientific topics, such as the discovery of the Neanderthal genome or the personalization of cancer treatment. *Science* Multimedia Center is a valuable source of scientific news prepared in approachable and visually attractive manner. Such innovative way of presenting science may certainly serve as a valuable tool and an inspiration to the academic teachers and science popularizers. All recordings can be accessed at:

<http://www.sciencemag.org/site/multimedia>.

Mission Therapeutics Ltd, a new British spin-out company, raised £6 million

A team led by Professor Stephen Jackson together with the Cancer Research Technology (Cancer Research UK's commercial arm) and the University of Cambridge announced launching Mission Therapeutics Ltd, the new spin-out company.

Mission Therapeutics will translate the newest cell biology research achievements on DNA repair from Professor Jackson's laboratory at the Gurdon Institute, University of Cambridge, into drugs which are intended to improve the management of life-threatening diseases, including cancer. Professor Jackson claims that these drugs could also improve the effectiveness of existing cancer treatments, such as radiotherapy and certain chemotherapies. The company will principally exploit new research on ubiquitin pathways that control cellular responses to DNA damage. More information about the research interest and projects conducted in Professor Stephen Jackson's laboratory can be found at:

<http://www.gurdon.cam.ac.uk/~jacksonlab>.

What is interesting, the company has raised over £6 million from a venture capital syndicate led by Sofinnova Partners company, together with Imperial Innovations (technology commercialisation and investment company), SR One (the corporate venture capital arm of GlaxoSmithKline) and Roche Venture Fund. Mission Therapeutics will be based on the Babraham Research Campus, Cambridge, UK.

Source: Mission Therapeutics Ltd press release, 25th of August 2011,
<http://www.missiontherapeutics.com>.