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Extra cellular matrix micro-environment control is a key issue to regenerative medicine and RGTA based matrix therapy a solution

Extra Cellular Matrix (ECM) microenvironment regulates locally our continuous ability to replace dead cells by new cells. This central law of all living is known as tissue homeostasis. Heparan sulfates (HS) are key elements of the ECM scaffold that store, protect and position the various Cell Communication Peptides (CCP) in the cellular microenvironment. HS play a pivotal role in the regulation of the bioavailability of CCP, cell proliferation, migration and differentiation required for tissue regeneration. Tissue injury will lead to destruction of cells and surrounding ECM. CCP released by inflammatory and circulating cells can then promote tissue repair, but with a loss of tissue quality, leaving scars or fibrosis. We have engineered biodegradable nano-polysaccharide mimicking HS, named RGTA for ReGeneraTing Agent. Introduced at the site of injury, RGTA will bind to the matrix proteins of the damaged ECM, and to the CCP produced by healthy neighboring cells, thereby restoring the ECM microenvironment and conditions for tissue homeostasis. This matrix therapy approach has considerably improved the quality of healing in various animal models with reduction or absence of fibrosis resulting in a real regeneration process. The RGTA technology has been validated in clinics and over hundred thousand of patients treated both for corneal and skin ulcers with no adverse effect. Adapted RGTA are in development for more tissue injuries extending RGTA as a new therapeutic class in the field of regenerative medicine exploiting our natural potential without need for exogenous cells. RGTA can combine with cell therapy by constructing a niche to favor homing. The future of regenerative medicine lays in a proper adjustment of the microenvironment to optimize cell colonization, expansion, replacement and recovery of their functions.

Biography

Denis Barritault graduated in Physics, completed his PhD in biochemistry in Paris University. Post-doctoral in molecular immunology at Pasteur Institute and NYU as NIH Fogarty Fellow he joined INSERM unit in Paris as developmental biologist. He made the first description and patents of FGF extracted from retina in 1979 and 82 as skin and cornea healing agent, became full professor at Paris-Est University in 1985, founded and directed a CNRS Laboratory on cell and tissue regeneration until 2003. He is now President of OTR3, Emeritus professor, honorary director CRRET CNRS unit and author in over 200 publications and 30 patents.

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