

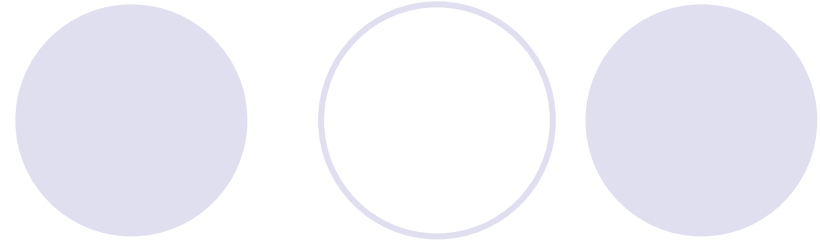
The Cell Constraint & Cancer (CC&C) project sprung from collaboration between academic institutions (University of Paris VI, Robotics; Hematopoietic Stem Cell Culture, Cochin Hospital) and a private CRO (Clinical Research, Montreuil, 93200).

CC&C S.A. wants to be part of a new branch of biology, cell/tissue biomechanics.

This will set up the bases for a new approach of the redifferentiation of cancer cell/tissue.

A world patent protects this disruptive innovation (WO 2008/132214).

The first in vitro experimentations have set up scientifically the phenotypic reversion as a possible way of treating cancer.



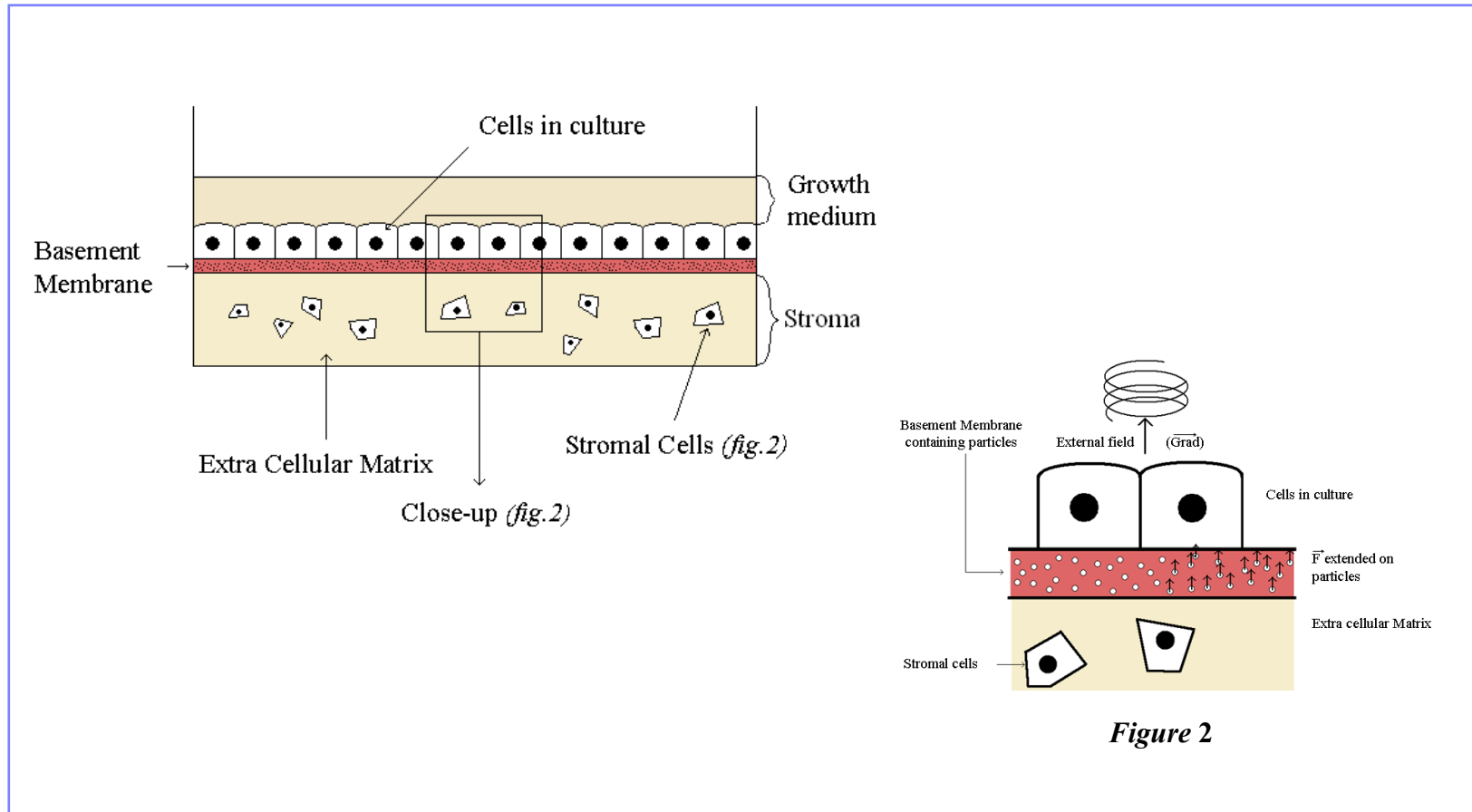
The patent can be summed up this way: cells are cultivated on gel, collagen for example. This layer is a model of Extra Cellular Matrix (ECM). (Nano)particles are included in the gel.

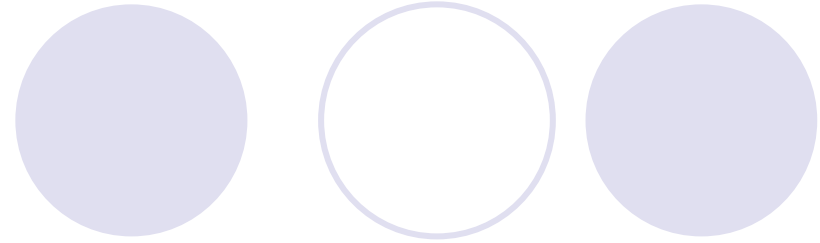
The culture well is in an external magnetic field. Every single particle produces a force, induced by the magnetic gradient. An overall force vector lines up the field and exerts a pressure on the overlying cells. The force changes the phenotype of the cells, depending on its intensity. *See Fig 1 and 2.*

[Bibliography: D Ingber, M Paszek, V Weaver and M Bissell].

Nanoparticles should be between 100 and 200 nmeters in the in vivo applications to fit the known diameters of the leaks in the tumor neoangiogenesis. (At least three products of this kind have been marketed as MRI contrast media).

Cell constraint Figures 1 and 2





A Therapeutic Potential?

The possibility to reverse out a cancerous phenotype with a constraint field is well established in vitro, but the processes used are not usable in vivo.

The obstacles to extrapolate the innovation from 2 dimensions (Cell culture) to 3D (in vivo or in Matrigel®-like systems) are anything but trivial, but feasible.

The concept has to be definitely validated. A first physical evaluation has been done by the Company Altran, showing the feasibility of cell culture system based on the innovation. A first demonstration in vitro has been recently displayed in a Poster.