Nice Melody for Innovative Mind-body Skin Care

Authors: Prof. P. Morganti, Mavi Sud s.r.l, Rome, Italy
Dr. Yuan-Hong Li, No. 1 Hospital of China Medical University, Shenyang, China
Prof. Hong-Duo Chen, China Medical University, Shenyang, China

Abstract

All cells and organisms are autonomous self-propagating chemical systems, made from a distinctive set of small carbon-based molecules. Each of these molecules is composed of a small set of atoms linked to each other in a precise configuration through covalent bonds.

Cell growth and division are coordinated to build tissues (and in turn the whole organism) with specific shapes and functions, in their characteristic locations and arrangements.

Reflecting, therefore, the independent origins of multicellularity, each organ and cell uses different molecules and structures to coordinate their own development by a bidirectional communication system of bottom-up and top-down specialised signals.

Therefore, living cells and organs such as the skin, are complex and dynamic chemical systems, operating far from chemical equilibrium. Of course, for a cell to grow or to make a new cell in its own image, it must take in free energy, as well as raw materials (nutrients) to drive the necessary synthetic reactions, depending also on other supporting cells and structures.

Moreover, any cell in a multicellular organ has been programmed during development to respond to a specific set of extracellular signal-molecules produced by other cells (short-lasting and/or long lasting signals). And these signal molecules act in various combinations to regulate the behaviour of the cell.

There exists, in fact, a continuous incoming of signals among the nervous, immune, cutaneous and the endocrine system.

These signals are necessary to start a set of cellular reactions which, by the production of different proteins, activate all the genes necessary for the cell's development.

Cell Specialisation

Differently from single-cell living organisms, the human body is a multicellular organisation of different tissues/organs, in which groups of cells perform specialised functions and are linked by intricate systems of communication. [1]

All organisms are autonomous self–propagating chemical systems, made from a distinctive set of small carbon-based molecules. Each of these molecules is composed of a small set of atoms linked to each other in a precise configuration through covalent bonds.

The main categories are sugars, fatty acids, amino acids and nucleotides. Sugars are a primary source of the chemical energy for cells and can be incorporated into polysaccharides (storage energy). Fatty acids are fundamental in the formation of cell membranes. Polymerised amino acids constitute the macromolecular proteins. Nucleotides play a central role in energy transfer and constitute the subunits for the informational macromolecules such as RNA and DNA. [2].

Thus, when a multicellular organ develops, single cells do not simply multiply these cells, but specialise them with different roles by a division of labour. In this way any cell found in any multicellular tissue/organ reflects its own individual and specialised role. Cell growth and division are coordinated to build tissues (and in turn the whole organism) with specific shapes and functions, in their characteristic locations and arrangements. Thus, all the cells communicate and interact with each other, with the tissues and the organs, coordinating their different roles and detecting and responding to their surroundings. Reflecting, therefore, the independent origins of multicellularity in humans, each organ and cell use different molecules and structures to coordinate their own development by a bidirectional communication system of bottom up and top down specialised signals (Figure 1, next page). [2]