

Tissue Engineering: An Ethical Approach in the Perspective of Principlism and Utilitarianism

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Abstract — Tissue engineering is an interdisciplinary research area in translational medicine characterized by a considerable complexity due to the attempt to combine cells, engineered materials and appropriate biochemical factors to favor regeneration, or improvement of tissue function, *ex vivo*. The current advances in tissue engineering, despite several promises are raising many problems in both medical and bioethical terms. The bioethical issues have to seriously concern both the scientists in the field, and the other stakeholders such as research policy makers, politicians, patients, entrepreneurs, and civil society. In this paper, I will consider and discuss the usefulness and complementarity of principlism and utilitarianism in bioethical decision. The principles of bioethics as defined by Anglo-American or European principlism and utilitarian bioethics basic elements are compared, in order to analyze if they could be only considered as tools serving the same end: the patients’ beneficence.

Keywords — tissue engineering, bioethics, principlism, utilitarianism, ethical decision

I. INTRODUCTION

Tissue engineering is dealing with production of living tissues or parts of an organ, *ex vivo*, by combining cells, engineered materials, as scaffolds, and proper biochemical factors to obtain biomaterials compatible with the recipient’s body [1-4]. The complexity and novelty of tissue engineering raise not only medical issues for the professionals in the field [5], but serious ethical problems too [6]. Therefore, the advances in tissue engineering depend on both the progress of research in the field and the right ethical decision. The ethics can not be ignored as long as the promises in some research areas of tissue engineering attract some pressures on the researchers made by various stakeholders including research policy makers, patients, entrepreneurs, and civil society. The potentially huge impact, of the successful development of tissue engineering, on people’s health and the pressures mentioned above could determine jumping over the stages on the road from basic research to clinical application. That is why, ethical debates in order to accommodate the demands of medical ethics and rich right ethical decision have to become a habitual task. To this end, researchers, medical professionals, moral philosophers,

research policy makers, politicians, patients, entrepreneurs, and civil society representatives have to work together in order to find the best solutions. That means that applied ethics have to become a driving force in eliminating the excesses of various theoretical concepts in bioethics and creating methods to reach advantageous ethical decisions assuring patients’ welfare.

In this paper, I shall try to suggest some arguments to consider the principlism and utilitarianism not totally conflicting, but complementary in terms of applied ethics.

II. PRINCIPLISM AND/OR UTILITARIANISM

A. The essentials of principlism in bioethics

The principlism theory is considered to be born in 1979, in a document entitled “Belmont Report” by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research [7]. However, the theory was developed and is mainly known as a result of Tom L. Beauchamp and James F. Childress efforts crowned by the textbook “Principles of Biomedical Ethics” now in its 6th edition [8]. According to Beauchamp and Childress bioethics has to operate with four *prima facie* principles: respect of autonomy, beneficence, non-maleficence and justice. It is noteworthy, some of these principles (such as beneficence, non-maleficence or justice) transcend from the Hippocratic Oath. The aforementioned principles stated by Beauchamp and Childress represent the so-called Anglo-American principlism.

In the Old Continent area, between 1995 and 1998, the European Commission funded a collaborative project including 22 partners coming from most EU countries. The project entitled “Basic Ethical Principles in European Bioethics and Biolaw” considered, examined and evaluated the moral values useful in ethical decision-making on the Continent. The project concluded with the “Barcelona Declaration” defining four fundamental principles: autonomy, dignity, integrity and vulnerability [9].

Beyond a detailed analysis, the two principlism concepts could be connected and intertwined, even though we will use a simplistic thinking. It is obvious that reaching the