The Use of Analogical Reasoning in Umbilical Cord Blood Biobanking

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Abstract In this chapter we investigate the roles that analogies play in the processes of understanding and managing umbilical cord blood biobanking. The objective is to unveil analogies' role as analytical devices in exploring the “being” of the new technology as well as their normative function in conceptualizing its characteristics and how it should be applied. We demonstrate how analogies have both explorative and argumentative functions, and how none of the analogies alone are able to address all the challenges raised by cord blood biobanking.

Introduction

Biological material has been used for medical diagnosis and biomedical research for a long time. However, the emergence of new technologies for analysing biological material to gain information for diagnosis and treatment choice, as well as methods generating new therapeutic products, has made such material much more salient within clinical practice and biomedical research. In addition, these technologies have made the commercial asset value of biological material much more visible.

New developments in biotechnology, such as therapeutic use of (pluripotent) stem cells has made the traditional distinction between organs, tissues and cells

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less relevant (Raymond et al. 2002: 257–265). One area where such new technology has given rise to a series of new possibilities and corresponding challenges is umbilical cord blood biobanking. Some of these challenges will be addressed in what follows. Umbilical cord blood biobanking is an especially interesting case because the material in the bank is of potential future therapeutic value to both the donor and others while at the same time it is of potential value to science. Umbilical cord blood haematopoietic stem cells are used for treatment of a wide variety of diseases, and have become a viable alternative source of haematopoietic stem cells to bone marrow transplantation (Rocha et al. 2006). Cord blood can be used in autologous as well as in allogenic transplantations and has given rise to both private and public biobanks. The intention behind our exploration of umbilical cord biobanking is to uncover the way we try to handle challenges related to new technologies, and the prominent role which analogies play in particular. New technologies pose fundamental questions of what the technology is, its correct understanding, and how it should be applied. We aim to show that we use an assortment of analogies to address the complex ontological, epistemological and ethical questions surrounding biobanking in its modern and technology-driven form, and that no single analogy seems able to cover the whole field on its own. What then are the main questions posed by biobank technology?

**Big Challenges with Small Amounts of Blood**

Within umbilical cord blood biobanking, i.e. the procurement, storage and use of umbilical cord blood, we are faced with a series of pertinent normative questions. The following list of questions is not exhaustive, although it may be exhausting. However, it illustrates how broad and deep the challenges are. Some of these questions relate to the issue of what biological material is: e.g. is it part of a person, and who owns the blood, the child, the mother or the parents (Lind 1994; Sugarman et al. 1997b; Zilberstein et al. 1997; Munzer 1999; Kline 2001; Dame and Sugarman 2001)? If it is conceived of as leftover or byproduct, what kind of rights does the child and its parents have with respect to umbilical cord blood (Knoppers and Laberge 1995), and does this depend on our understanding of the production process of which it is a byproduct? If they do not have property rights, do they have other rights with respect to accessing this material (in terms of stem cells, other umbilical cord blood products or information derived from these products)?

Other issues are related to challenges of regulation and management. For example, if the cord blood has potential for commercialization and commodification, how should this be regulated? Should biobanks be governed by the invisible hand of the market or should there be equitable profit sharing (Merz et al. 2002) and just distribution of estimated or actual outcomes (Merz et al. 2002; Smaglik 2000)? May biobank material be sold (across national borders) or is commercialization of such material unacceptable in principle (Holm 2004)? Should there be control of downstream use and patenting (Merz et al. 2002), and how should one avoid exploitation?

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2 It is interesting to note that blood itself poses some of the same challenges: is it an organ or a cluster of cells?