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Opportunities and Tensions in Convergence: Emerging Molecular Medicine's Emerging Concepts of Disease

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Abstract

A new wave of biomedical technologies has emerged as a result of the convergence of ICT, nanotechnology, and biomedical sciences, resulting in visions of "molecular medicine." This paper examines how the emerging field of molecular medicine may alter both the definition of "disease" and the boundary between health and disease, as new technologies frequently alter concepts of health and disease. It provides a brief synopsis of molecular medicine's development and often highly speculative visions. Following that, a brief discussion is given to three common philosophical perspectives on disease: the physiological, normative, and ontological (neo-ontological) concepts of disease. In light of this, two trends in molecular medicine stand out: the use of a disease cascade model and the idea that disease is a deviation from an individual pattern of functioning. It becomes abundantly clear that concepts of health and disease are pushed in diverse, sometimes opposing directions by molecular medicine. However, the tensions that result may also present opportunities to direct the medical profession's future in more favourable directions.

Keywords: Molecular medicine; Nano medicine, Concept of disease; Concept of health; Technology; Reductionism; Personalized medicine

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Introduction

Converging technologies, according to their advocates, will produce amazing results. They are anticipated to provide numerous advantages to a variety of fields, including medicine. The convergence of biomedical knowledge, nanotechnology, and information and communication technologies (ICT), it is claimed, will "revolutionize" both medical science and health care practice. According to Robert Freitas, a pioneer in American Nano medicine, this convergence may result in a completely "molecular" form of medicine [1]. It will intervene in bodily processes at the molecular level by utilizing Nano-sized instruments and knowledge of molecular bodily functioning. The sketch that Freitas gives of the future of medicine is very speculative. The techno enthusiast's impatience is shown by his expectations. His assertion, on the other hand, that a "molecular medicine" is emerging as a result of the convergence of various technologies certainly has its foundation in current visions and technological and scientific advancements. The term "molecular medicine" serves as the guiding ideal for recent visions, research agendas, roadmaps, and funding opportunities for Nano medicine in Europe and the United States [2]. The nature of the visions involved merits philosophical consideration, despite the fact that the applications are currently limited or perhaps especially so. What exactly is intended for the medical profession's future? Will it simply provide more efficient tools to achieve the broadly agreed-upon objectives of promoting health and reducing illness? Or will these objectives themselves change as a result of the process? As the introduction to this special issue points out, many of the fundamental ideas we use to make sense of the world are being altered by convergent technologies: The "symbolic order" is altered. This assertion is further developed in this paper in relation to convergent medical technologies [3]. The primary inquiry is: Will developments toward molecular medicine, both now and in the future, alter the meanings of "disease" and "health," and if so, in which direction? In order to investigate how molecular medicine conceptualizes

health and disease, I will first outline the domain's visions, expectations, and on-going developments. Following a brief discussion of how technology as a whole constitutes "disease," I will present three well-known philosophical approaches to disease conceptualization: the physiological, normative, and ontological (neo-ontological) concepts of disease [4].

Converging Technologies Facilitate the Emerging Field of Molecular Medicine

Molecular medicine First of all, it should be noted that I use this term to refer to a wide range of technological, scientific, and social developments as well as visions of the future of medical science and health care that are all made possible by convergent technologies. Therefore, I consider molecular medicine to be more than just a collection of technological tools; it is a complicated web of scientific, social, and technological advancements that interact with one another. In addition, these advancements are motivated by prevailing notions of what medical practice ought to be all about. However, by employing a single term, this paper inevitably gives the impression that these visions and developments are more unified and real than they actually are [5]. So, it's important to remember that we're talking about a new set of ideas and developments that seem to be heading in the same direction, but a lot of them are still speculative. Second, the terms "bio nanotechnology" and "Nano medicine" are sometimes used to refer to convergent technologies in the medical field. Non-medical applications are included in the term "bio nanotechnology," which refers to the merging of nanotechnology and life sciences. It is too broad for this paper's focus. On the other hand, Nano medicine appears to encompass the majority of what I will refer to as molecular medicine here. The phrase "the application of nanotechnology to health" or "medical intervention at the molecular scale for curing disease or repairing damaged tissues" is already well-known in Europe and the United States. Despite the fact that the term "Nano medicine" may be used more frequently, there are three reasons why I prefer the term "molecular medicine." To begin, "Nano medicine" overlooks the crucial role that ICT plays in visions of the future of medicine [6]. The majority of applications of nanotechnology for medical purposes would not be realized at all if large databases and methods for data analysis and communication were not developed. ICT, like nanotechnology, makes it possible for biomedical research and practice to move in a particular direction. As a result, a strategy for medical research and a plan for how medicine will be done in the future are all part of molecular medicine. Medical applications should result from scientific knowledge of bodily processes at the molecular level. According to the National Institutes of Health, the first phase focuses on "understanding nature's rules of biological design that in turn will enable researchers to correct defects in unhealthy cells," while the second phase "will be applied to understanding and treating disease" with "the acquired fundamental knowledge and developed tools [7]."

Disease and Health Concepts and Technology's Role

However our symbolic order's categories of health and disease are also extremely elusive. When it comes to the phenomena of well-being and suffering, these concepts encompass a diverse set of meanings. The line that separates the two is important to the distribution of a lot of social roles and moral responsibilities, like who can get medical care, who can avoid certain responsibilities, and what constitutes responsible behavior. Philosophers have spent a lot of time and effort trying to define the line that separates these ideas and capture their essence. The realization that the meanings of "disease" and "health" tend to change over time has hampered these endeavours [8]. Several behaviours or experiences, such as homosexuality and female hysteria, that were once considered diseases are no longer so. Additionally, due to fundamental shifts in disease explanatory models, individual cases have been included or excluded from disease categories. This has brought up the question of whether these changes in meaning are the result of changing phenomena, shifting knowledge and explanation models, technological advancements, or just a lack of precision in language use. This is not the place to go into detail about these questions. I will join philosophers in arguing that the meaning of the term "disease" cannot be determined through appropriate objective methods. The vocabularies and frameworks we use to talk about the human body heavily influence how we think about disease and reality as a whole. The technologies that allow for the investigation of the body, on the other hand, have a significant impact on these. According to Hofmann's findings, technology provides the physiological, biochemical, and bimolecular entities utilized in disease definition [9]. In addition, it determines how we respond to disease, influences explanatory models, and forms the disease's signs, markers, and end points. He is correct in arguing that this leads to the conclusion that "disease" is a technological invention.

Model of Disease Cascade

The character of this ambition is intellectual as well as practical. It is asserted that knowledge of and insight into the natural history of disease can be obtained through molecular medicine. "The dynamic progression of disease should be reflected in temporal change(s) from the normal state to the various stages of disease-perturbed networks," state systems biologist Leroy Hood and colleagues. As is evident from Hood's work as well as the research agendas of the National Institutes of Health and the European Technology Platform on Nano medicine, molecular biomarkers are a focus of concern in current developments advancing molecular medicine. Such knowledge and insight would, consequently, provide a truly scientific basis for timely medical intervention. It is believed that these biomarkers indicate particular stages in the process of bodily function. For a few slightly different definitions of a biomarker, see. They can be changes in biochemical or anatomical characteristics. Molecular epidemiological studies look for connections between specific molecular characteristics and disease outbreaks in order to identify biomarkers [10].

Conclusion

However, the physiological understanding of disease is frequently severely limited in molecular medicine, as previously mentioned. It typically employs a biological-reductionist perspective on disease and a straightforward linear model of disease causation in which the body's environment receives little attention. The first limitation might be overcome by molecular medicine systems biology approaches that claim to abandon the linear model and construct intricate network models of disease. However, even in systems biology, the majority of attention is paid to the upward processes. Rarely are interactions in the opposite direction examined, particularly those with levels in the system hierarchy above the individual. Kush argues that researchers in molecular medicine should consider the systems metaphor's implications more seriously. An "objectivist" approach to health and disease is generally supported by the cascade model of disease, whether interpreted in a neo-ontological, physiological, or systems biological manner. Devices and frequently professionals are required to determine whether a person is ill or not because disease hides in the body for a long time and subjects only become aware of it later. As a result, there is a gap between subjective experience and objective measurement. In addition, the interventions that are suggested are typically biochemical in nature. A significant portion of molecular medicine demonstrates this effect as well. This model has a tendency to reduce the role and influence of subjects.

References

1 Hofmann B (2001) Complexity of the concept of disease as shown through rival theoretical frameworks. Theor Med 22: 211-236.

2 Johnson JA, Evans WE (2002) Molecular diagnostics as a predictive tool: genetics of drug efficacy and toxicity. Trends Mol Med 8: 300-305.

3 Khushf G (2007) an agenda for future debate on concepts of health and disease. Med Health Care Philos 10: 19-27.

4 Langer R (2009) Perspectives and challenges in tissue engineering and regenerative medicine. Adv Mater2009 21: 3235-3236.

5 Penders B, Horstman K, Saris WHM, Vos R (2007) from individuals to groups: a review of the meaning of 'personalized' in nutrigenomics. Trends Food Sci Technol 18: 333-338.

6 Severinsen M (2001) Principles behind definitions of disease a criticism of the principle of disease mechanisme and the development of a pragmatic alternative. Theor Med 22: 319-336.

7 Strasser BJ (2006) Sickle cell anemia, a molecular disease. Science 286: 1488-1490.

8 Stempsey WE (2006) the geneticization of diagnostics. Med Health Care Philos 9: 193-200.

9 Fortina P, Kricka LJ, Surrey S, Grodzinski P (2005) Nano biotechnology: the promise and reality of new approaches to molecular recognition. Trends Biotech 23: 168-0173.

10 Hofmann B (2001) the technological invention of disease. J Med Ethics Med Humanit 27: 10-19.