Medical sociology and molecular medicine: is there a case for cross-cutting disciplinary boundaries?*

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We are told that the 21st century is the century of molecular medicine. Huge investments are undertaken into research and capacity building, most visibly in universities and large research organizations. Far-reaching promises of improving health and ageing and of reducing chronic diseases in the near future are being made to the broader public. Although these promises are rarely based on solid facts – and may express interests of augmenting knowledge and capital more directly than public health concerns – there is growing support and recognition of the paradigm of molecular medicine in the scientific community as well as in health care worldwide. Despite this paradigm's undisputed scientific progress it is of interest to observe the rise of a strictly biological and genetic concept of health and disease in times where rapid changes in patterns of disease incidence are witnessed across countries, and where evidence of environmental, socio-economic and psychosocial determinants of health is accumulated in an unprecedented way.

Examples of the former are the dramatic increases in obesity and diabetes in developed and in rapidly developing countries, together with cardiovascular and affective disorders, or the spread of HIV, accidents and homicide in association with social disintegration, rapid economic change and migration. Widening social inequalities of major chronic diseases demonstrate the far-reaching contribution of social factors to the burden of disease in a global perspective.

It is unlikely that changes in the genetic make-up of populations in such a short time period can account for these observations to any significant degree. Yet, despite these discrepancies little exchange and collaboration occurs so far between the academic elites of biomedical and genetic research on the one hand and the scientific community of public health, epidemiology and medical sociology on the other hand. Is there a case for cross-cutting these disciplinary boundaries? Strictly speaking, there are good reasons for continued lack of exchange. Epidemiology and public health are interested in factors that affect the health of populations, whereas the focus of molecular medicine is on analyzing individual risk and explaining inter-individual variance of disease. Moreover, methodological traditions, measurement approaches and cultural orientations between the two scientific communities are markedly different, and training and staff recruitment is mainly organized in separate institutions. Finally, there are powerful barriers against the development of transdisciplinary research because the latter is often experienced as threat to professional identity and related career prospects.

Nevertheless, cross-fertilization between the social and the molecular health sciences might be timely and hold promise for advances in understanding and influencing disease development. Convincing recent research findings demonstrate that disease explanations based on gene-environment analysis are more powerful than those restricted to either disciplinary background, molecular medicine or public health research. This holds equally true for a gene-social environment analysis. The study by Caspi et al. on an interaction of life stress and genetic susceptibility (polymorphism in the 5HTT-gene) in explaining the occurrence of depression in young adults is one such example (Caspi et al. 2003). Cross-fertilization may also be stimulated through incorporation of new biological markers into experimental and epidemiological studies on the role of psychosocial stress in disease development. The transcription factor nuclear factor kappa B (NF-kappa B), is one such marker. In an experiment on a socially stressful task – to give a rapidly prepared speech before an expert audience – a significantly increased induction of this marker was observed (Bierhaus et al.

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2003). As NF-kappa B is involved in gene expression and mononuclear cell activation with direct effects on immunocompetence, it may play a critical role in elucidating the transduction of stressful experience into altered cellular activation that in the long run promotes the development of chronic disease, such as inflammation-induced atherosclerosis (see also Esch et al. 2002).

Another example of cross-fertilizing research concerns the epidemiological analysis of combined effects of traditional cardiovascular risk factors (such as cigarette smoking) and of more recently established psychosocial risk factors (chronic work stress in terms of effort-reward imbalance) on stem-cell mediated endothelial regeneration. A reduced level of circulating endothelial progenitor cells was discovered in people who are heavy smokers and who suffer from recurrent work stress in terms of high effort and low reward (Fischer et al. 2004). Reduced level of endothelial stem-cells prevents repair mechanisms that are activated in case of endothelial lesions in coronary vessels. This failing mechanism may be critical in triggering the progression of cardiovascular disease.

Certainly, these are selective illustrations that need further scientific confirmation. Yet, they concern scientific progress in the analysis of two chronic diseases, depression and coronary heart disease – that, by the year 2020, will play a leading role in premature mortality and disability adjusted life years worldwide (Murray & Lopez 1996). Cross-cutting the disciplinary boundaries between molecular medicine and public health research including medical sociology may be a timely challenge for both parties.

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