Bridging the gap between system and molecular biology. The case of melanoma

Giovanni Boniolo*†[2,1]

[2]European Institute of Oncology (IEO) – via Adamello 16 - 20139 Milano, Italy
[1]Department of Health Sciences, University of Milano – Italy

Abstract

Since the seminal papers by A. Barabasi and colleagues, network biology has increased its relevance in the scientific community. This way of connecting data has had supporters and critics. Surely it offers the enormous advantage to link, also with an immediate and intuitive visual rendering, information before disconnected. Nevertheless, it implies a lost of detailed molecular information. This is not an unexpected consequence, indeed. Systems biology (network biology in particular) allows a way of considering molecular entities and processes which is, *ab initio,* different from that one offered by molecular biology. Working with the former means missing details, working with the latter means missin the overall view. Is there a manner of connecting them?
I want to address this point and, after discussing the epistemological differences between the two approaches, I present a formal bridge between them that should permit to move from the information typical of network biology to the information typical of molecular biology. This bridge could spur philosophers to rethink in term of epistemological pluralism the scientific approaches. Many times we – philosophers – are too strictly tied to a given particular epistemological perspective to successfully cope with a science, such as contemporary biology, which follows its own paths and almost every day shows us different aspects.
I will exemplify the usefulness of a pluralistic perspective by discussing the melanoma network and the molecular level of the disease. In this way I will illustrate how we could have a real integration between the information pertaining to the systemic level and to the molecular level.

*Speaker
†Corresponding author: giovanni.boniolo@ieo.eu