Explanatory frameworks in molecular oncology: the case of the gene p53

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Abstract

What has been called the new mechanistic philosophy conceives of mechanisms as the main providers of biological explanation. This talk draws on the characterization of gene p53 in molecular oncology, to show that explaining a biological phenomenon (cancer, in our case) implies instead a dynamic interaction between themechanistic level-rendered at the appropriate degree of ontological resolution-and far more general explanatory tools that perform a fundamental epistemic role in the provision of biological explanations. We call such tools "explanatory frameworks". They are called frameworks to stress their higher level of generality with respect to bare mechanisms; on the other hand, they are called explanatory because, as we show in this paper, their importance in explaining biological phenomena is not secondary with respect to mechanisms. The talk will illustrate how explanatory frameworks establish selective and local criteria of causal relevance that drive the search for, characterisation and usage of biological mechanisms. Furthermore, the talk will show that explanatory frameworks allow for changes of scientific perspective on the causalrelevance of mechanisms going beyond the account provided by the new mechanistic philosophy.

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