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Ground that: Enforcing a benchmark for neoantigen prediction in personalized immuno-oncology

Abstract

This paper expands on a recent series of works asserting that algorithms – be they associated with terms such as « big data », « machine learning », or « artificial intelligence » – fundamentally derive from referential benchmarks, often called ground truths, that gather input data and output targets, thereby establishing what can (and should) be retrieved computationally (Henriksen and Bechmann, 2020; Jaton, 2021). The paper explores the case of neoantigen prediction for personalized immuno-oncology (Wells et al., 2020) where the « truth » of the targets to be retrieved by the would-be algorithms – i.e., immunogenic neoantigens – depends upon a broad technoscientific network whose setting up implies important organizational and material resources. Moreover, this collective ground-truthing endeavor ends up enforcing one specific version of immunogenic neoantigens, quite at odds with simultaneous discoveries in fundamental biology but equipped enough to be considered the most acceptable among computational biologists. This case study thus shows how ground truths – due to the massive amount of work required to build them and the potentialities they enable once they are built – sometimes operate as infrastructure, governing what can, or cannot, be considered relevant research in applied computational science.

References:

- Henriksen A and Bechmann A (2020) Building Truths in AI: Making Predictive Algorithms Doable in Healthcare. Information, Communication & Society 23(6) : 802–16.
- Jaton F (2021) The Constitution of Algorithms: Ground-Truthing, Programming, Formulating.Cambridge, MA: MIT Press.
- Wells DK, van Buuren MM, Dang KK, Hubbard-Lucey VM, Sheehan KCF, Campbell KM, Lamb A, et al. (2020) Key Parameters of Tumor Epitope Immunogenicity Revealed Through a Consortium Approach Improve Neoantigen Prediction. Cell 183(3) : 818-34.

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